CHAPTER 3 – PROJECT DESCRIPTION

All exhibits are located at the end of this chapter, not immediately following their reference in the text.

3.1 INTRODUCTION

This chapter contains a detailed description of the proposed project, the Optimum Basin Management Program Update (OBMPU), with focus on those program characteristics and activities that have the potential to cause a direct physical change in the environment, or a reasonably foreseeable indirect physical change to the environment. This project description focuses on the relationship between OBMPU Program Elements and activities and facilities proposed by the overall OBMPU programs that may be implemented if the proposed program is approved by the Chino Basin Watermaster (CBWM or Watermaster). However, because the CBWM is not considered a public agency, and the Inland Empire Utilities Agency (IEUA) has jurisdiction throughout most of the Chino Basin, it has agreed to serve as the Lead Agency for purposes of complying with the California Environmental Quality Act (CEQA). Actual implementation of the OBMPU activities described herein may be carried out by the CBWM or any of its member agencies/stakeholders in the Chino Groundwater Basin (Chino Basin) through the planning period, 2020 through 2050.

The description of the OBMPU's scope in this document is of necessity expansive as it covers the nine (9) Program Elements (PEs) that make up the original OBMP, and which were analyzed in a 2000 Program Environmental Impact Report (2000 PEIR). The OBMPU is intended to address possible program activities and projects at a programmatic level over the next 30 years, with some site-specific detail where near-term future locations of facilities are known. The CBWM and stakeholders have been meeting to review Program Elements and define potential project activities and facilities for about the past two years. The CBWM and parties/stakeholders of the OBMPU and regulatory agencies that will function as CEQA Responsible Agencies will have the option of relying upon this CEQA document for any future actions they take in support of the proposed program or an individual project described in this environmental document.

In conjunction with this project description, CBWM and IEUA have authorized the preparation of a detailed Initial Study (attached) to determine whether the OBMPU, as defined below, has the potential to cause any significant adverse environmental impacts. Based on the findings in this Initial Study, a decision has been made to circulate this Initial Study which recommends that a focused Program Environmental Impact Report (PEIR) be prepared to address environmental issues that may result in potentially significant adverse environmental impacts.

The OBMPU and its associated activities are so interrelated that they merit consideration under a single CEQA document. CBWM and IEUA are in the unique position to evaluate implementation of the OBMPU on behalf of the Chino Basin as they integrate management of water supply, wastewater and groundwater management over the next 30 years and derive important benefits through cooperation with all other water management agencies and stakeholders in the Chino Basin.

This current environmental review is the most recent in a series of environmental documents that began in 1999-2000 when the original OBMP PEIR was published and certified. These documents include the following:

- *Final Program Environmental Impact Report for the Optimum Basin Management Program* (SCH#200041047), July 2000 prepared by Tom Dodson & Associates (2000 OBMP PEIR)
- *Final Program Environmental Impact Report for the Wastewater Facilities Master Plan, Recycled Water Master Plan, Organics Management Master Plan* (SCH#2002011116), June 2002 prepared by Tom Dodson & Associates
- *Final Subsequent Environmental Impact Report for Inland Empire Utilities Agency Peace II Project* (SCH#2000041047), September 2010 prepared by Tom Dodson & Associates (2010 Peace II SEIR)
- *IEUA Facilities Master Plan Final Environmental Impact Report* (SCH#2016061064), February 2017 prepared by ESA (2017 FMP EIR)
- *IEUA Addendum to 2000 OBMP PEIR*, March 2017 prepared by Tom Dodson & Associates (2017 OBMP Addendum)

These documents were prepared to address planned water, wastewater, biosolids, and recycled water management activities in the Chino Basin as called for by the OBMP's Program Elements, originally analyzed in the 2000 OBMP PEIR. Each document addresses changes in management activities at different times over the past 20 years and each document provides an important update of environmental conditions and management activity impact forecasts on the environment that constitutes a fundamental building block of support for local agencies when seeking funding from state or federal agencies that provide grants or loans to implement the facilities required to meet the then current management objectives/requirements within the Chino Basin. Some examples of such facilities already implemented and supported by previous environmental documents include the Chino Basin desalters, recharge basin utilization, pipelines to convey water from points of origin to points of use, and aquifer storage and recovery wells.

The OBMPU is being analyzed in this updated environmental document for several reasons:

1. First, while the OBMP goals have been partially achieved, the understanding of the hydrology and hydrogeology of the Chino Basin has substantially improved since 2000. This understanding opens up opportunities to revise the OBMP for the benefit of the Chino Basin parties.
2. Second, updated programs, such as the Updated Storage Management Plan, have been identified that will affect most of the OBMP Program Elements (described in detail in the following text).
3. Third, there are new water management issues have been identified that necessitate adapting the OBMP to protect the collective interests of the Chino Basin parties and their water supply reliability. Specific examples include: adaptation to climate change (including future drought conditions); focused management activities to address salt balance in the Chino Basin; and the emergence of environmental management issues affecting the whole of the Upper Santa Ana River Watershed.
4. State and federal agencies that provide funding for water management projects typically want to have an environmental document that contains a current environmental data base. The OBMPU environmental document will establish an appropriate environmental baseline for both new and revised facilities for the near future. The most recent Basin-wide water management environmental document is now 10 years old (Peace II, 2010) and no longer contains a current environmental baseline.

3.2 PROJECT LOCATION

The Chino Basin is one of the largest groundwater basins in Southern California and has an unused storage capacity of over 1,000,000 acre-feet. The Chino Basin covers approximately 235 square miles within the Upper Santa Ana River Watershed and lies within portions of San Bernardino, Riverside, and Los Angeles counties. Exhibit 1 shows the location of the Chino Basin within the Upper Santa Ana River Watershed. The Chino Basin consists of an alluvial valley that is relatively flat from east to west, sloping from north to south at a one to two percent grade. Basin elevation ranges from about 2,000 feet adjacent to the San Gabriel foothills to about 500 feet near Prado Dam. As shown in Exhibit 2, the Chino Basin is bounded:

- on the north by the San Gabriel Mountains and the Cucamonga Basin;
- on the east by the Rialto-Colton Basin, Jurupa Hills, and the Pedley Hills;
- on the south by the La Sierra Hills and the Temescal Basin; and
- on the west by the Chino Hills, Puente Hills, and the Spadra, Pomona, and Claremont Basins.

The 2000 Optimum Basin Management Program (OBMP), focused on management actions within the Chino Groundwater Basin (Chino Basin or the Basin) as shown on the inset on Exhibit 1. Exhibit 2 illustrates the boundary of the Chino Basin as it is legally defined in the stipulated Judgment in the case of Chino Basin Municipal Water District *vs.* the City of Chino *et al.* Exhibit 2 also shows the Regional Water Quality Control Board, Santa Ana Region (Regional Board) management zones as established in the Water Quality Control Plan for the Santa Ana River Basin (Basin Plan).

The principal drainage course for the Santa Ana River watershed is the Santa Ana River. It flows 69 miles across the Santa Ana Watershed from its origin in the eastern San Bernardino Mountains to the Pacific Ocean. The Santa Ana River enters the Chino Basin at the Riverside Narrows and flows along the southern boundary to the Prado Flood Control Reservoir, where it is eventually discharged through the outlet at Prado Dam and flows the remainder of its course to the Pacific Ocean. The Basin is traversed by a series of ephemeral and perennial streams that include: San Antonio Creek, Chino Creek, Cucamonga Creek, Deer Creek, Day Creek, Etiwanda Creek and San Sevaine Creek. Please refer to Exhibit 2 for the location of drainages.

These creeks flow primarily north to south and carry significant natural flows only during, and for a short time after, the passage of Pacific storm fronts that typically occur from November through April. IEUA discharges year-round flows to Chino Creek and to Cucamonga Channel from its Regional Plants. The actual volume of wastewater discharges varies seasonally and is expected to attenuated in the future by a combination of water conservation measures being implemented by water users and through diversion of flows for delivery as recycled water to future users that can utilize this source of water, including landscape irrigation, industrial operations, and recharge into the Chino Basin groundwater aquifer.

The Chino Basin is mapped within the USGS – Corona North, Cucamonga Peak, Devore, Fontana, Guasti, Mount Baldy, Ontario, Prado Dam, Riverside West and San Dimas Quadrangles, 7.5 Minute Series topographic maps. The center of the Basin is located near the intersection of Haven Avenue and Mission Boulevard at Longitude 34.038040N, and Latitude 117.575954W.

3.3 PROJECT PURPOSE AND OBJECTIVES

The *2020 Optimum Basin Management Program Update Report* (2020 OBMP Update Report), released in July 2019 by CBWM, documents the stakeholder process that was used to update the OBMP and it describes the 2020 OBMP Management Plan. The management plan forms the basis for the 2020 OBMP Implementation Plan Update. Through this process, the stakeholders concluded that the goals of the 2020 OBMP Update should be identical to the 2000 OBMP goals.

Accordingly, the 2020 OBMPU's goals remain the same as the 2000 OBMP's goals:

> ***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.

3.4 PROJECT CHARACTERISTICS (Original OBMP, OBMP Implementation to Date, and OBMPU Program Elements)

3.4.1 Introduction

The Optimum Basin Management Program (OBMP) is a regional water resources and groundwater management program for the Chino Basin. The location of the Chino Basin is shown in Exhibit 1. On January 2, 1975, several Chino Basin groundwater producers filed suit in the California State Superior Court for San Bernardino County (Court) to settle the problem of allocating water rights in the Chino Basin. On January 27, 1978, the Court entered a judgment in "Chino Basin Municipal Water District v. City of Chino et. al." (Judgment). The Judgment adjudicated the groundwater rights of the Chino Basin, established the Watermaster--a Court created entity—to administer the Judgment, and contains a Physical Solution to meet the requirements of water users having rights in or dependent upon the Chino Basin. Exhibit 2 shows the adjudicated boundary as it is legally defined in the Judgment, the hydrologic boundary, the Chino Basin management zones, and the groundwater management zones defined by the Santa Ana Regional Water Quality Control Board (Regional Board) in the Water Quality Control Plan for the Santa Ana River Basin (Basin Plan).

3.4.2 Project Characteristics

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).[1]

The four goals of the 2000 OBMP included:

Goal 1 – Enhance Basin Water Supplies
Goal 2 – Protect and Enhance Water Quality
Goal 3 – Enhance Management of the Basin
Goal 4 – Equitably Finance the OBMP

The actions defined by the stakeholders to remove the 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*.[2]

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.

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[1] 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
[2] 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 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.

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 this 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 (facilities and operations) were incorporated into a recommended management plan. The Parties used the management plan as the basis for developing the OBMP Implementation Plan (which identified specific projects for implementation under the OBMP) and an agreement between the Watermaster parties and stakeholders (the Peace Agreement) to implement it. The OBMP Implementation Plan is Exhibit B to the Peace Agreement. The Peace Agreement was reviewed in the 2000 OBMP PEIR.

The Parties entered into the Peace Agreement in June 2000. Under Resolution 2000-05,[3] 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 herein, 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 (see discussion of Peace II below), the OBMP Implementation Plan, the PEIR, and any amendments to these documents.

3.4.2.1 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 (see Section 3.3.4.3) 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

[3] Chino Basin Watermaster. (2002). The Resolution approving the OBMP is provided on the Watermaster's website.

afy. The Peace II Agreement introduced Re-operation[4] to achieve Hydraulic Control[5] 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, which is discussed on P. 34) 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 as a result of Peace II.

The IEUA Board certified a supplemental environmental impact report (SEIR) for the Peace II Agreement in 2010 (IEUA Addendum to 2000 OBMP PEIR).

3.4.2.2 2017 Addendum to the OBMP PEIR

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."[6] The addendum was supported with engineering work that demonstrated that this temporary increase in SSC would not cause material physical injury (MPI) or loss of Hydraulic Control.

3.4.2.3 Need for the 2020 Optimum Basin Management Program Update (OBMPU)

The 2000 OBMP contains a set of management programs (the PEs) 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 and valid planning assumptions at that time.

As of 2020, many of the projects and management programs envisioned in the 2000 OBMP have been and continue to be 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 implementation actions 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.

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[4] 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.
[5] 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.
[6] Tom Dodson & Associates. (2017). *Addendum No. 1 to the Optimum Basin Management Program Project*. Page 2.

Exhibit 3 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.

As shown in Exhibit 3, growth is one of the drivers shaping water and basin management. As urban land uses replace agricultural and vacant land uses, the water demands of the Chino Basin Parties are expected to increase. The table below summarizes the actual (2015) and projected water demands, water supply plans, and population through 2040. Total water demand 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 through 2040 is driven by the Appropriative Pool Parties, some of which will serve new urban water demands created by the conversion of agricultural and vacant land uses to urban uses.

Table 3.1
AGGREGATE WATER SUPPLY PLAN FOR WATERMASTER PARTIES: 2015 TO 2040[7]

Water source	2015 (Actual)	2020	2025	2030	2035	2040
Volume (af)						
Chino Basin Groundwater	148,467	139,236	144,314	151,525	164,317	173,522
Non-Chino Basin Groundwater	51,398	55,722	61,741	63,299	64,991	66,783
Local Surface Water	8,108	19,653	19,653	19,653	19,653	19,653
Imported Water from Metropolitan	53,784	90,444	97,657	103,684	105,152	111,036
Other Imported Water	8,861	9,484	10,095	10,975	11,000	11,000
Recycled Water for Direct Reuse**	17,554	23,678	24,323	26,910	30,451	33,953
Total	**288,171**	**338,218**	**357,782**	**376,046**	**395,564**	**415,947**
Percentage						
Chino Basin Groundwater	52%	41%	40%	40%	42%	42%
Non-Chino Basin Groundwater	18%	16%	17%	17%	16%	16%
Local Surface Water	3%	6%	5%	5%	5%	5%
Imported Water from Metropolitan	19%	27%	27%	28%	27%	27%
Other Imported Water	3%	3%	3%	3%	3%	3%
Recycled Water for Direct Reuse	6%	7%	7%	7%	8%	8%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Population (million)*	1.95	2.07	2.21	2.38	2.57	2.73

*The population projection is based on the service area population of all Chino Basin Appropriative Pool agencies. For some Appropriative Pool agencies, the service areas expand outside of the Chino Basin. The population data provided under Environmental Setting in Section XIV, Population and Housing provides a more accurate representation of the population within the Chino Basin, and more accurately reflects the population within the general areas in which OBMPU facilities are proposed to be developed.
**These data were obtained from the 2018 Storage Framework Investigation (SFI) prepared by WEI.

[7] Sourced from: WEI. (2019). *Final 2020 Storage Management Plan*. December 2019.

As stated under Section 3.3, Project Purpose and Objectives, the stakeholders concluded that the goals of the 2020 OBMP Update (OBMPU) are identical to the 2000 OBMP goals. The goals and their intents for the OBMPU include:

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.

3.4.3 OBMPU Program Elements

There are physical, institutional, and financial impediments to achieving the OBMPU goals. The stakeholders identified and described several management activities that, if implemented, could remove these impediments and achieve the OBMPU goals. These activities have objectives and tasks that are directly related to one or more of the 2000 OBMP PEs. Thus, the nine PEs defined in the 2000 OBMP have been retained for the OBMPU. The OBMPU Implementation Plan Update (OBMPU IP) is a revision of the implementation plans included in the Peace I and Peace II Agreements and incorporates the proposed activities and facilities identified in the 2020 OBMPU and ongoing activities from the 2000 OBMP. The Project Description that follows those projects contained in the OBMPU Implementation Plan (IP) is an update to the OBMP Project Description evaluated in the 2000 OBMP PEIR and the 2010 Peace II SEIR. This environmental document will be used for all of the OBMPU components including the Implementation Plan whose proposed facilities are identified in the following section of this Project Description.

This section describes a series of one-time actions and ongoing management processes, organized by PE, that help achieve the goals of the OBMPU and set the framework for the next 30 years of basin-management activities. The implementation actions are listed by PE in Exhibit 4. Implementation of these management actions may result in the construction and operation of new facilities or the substantial upgrade of existing facilities and their operations. The facilities improvements that could result from the implementation of the OBMPU are listed in Exhibit 5.

For each PE, the following subsections (3.4.3.1 through 3.4.3.8) describe: the objectives and implementation actions established in 2000, implementation progress since 2000, and the implementation actions of the OBMPU, including the potential facility improvements that could result from implementation.

3.4.3.1 Program Element 1. Develop and Implement Comprehensive Monitoring Program

3.4.3.1.1 Objectives

The objective of PE 1 in the 2000 OBMP—*Develop and Implement Comprehensive Monitoring Program*—was to provide the information necessary to support the implementation of all other OBMP PEs and to evaluate their performance over time. The OBMPU restates the objective of PE 1: 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.

3.4.3.1.2 2000 OBMP Project Description and Implementation Progress

Watermaster began implementing its monitoring programs during the development of the 2000 OBMP. Pursuant to the 2000 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 and implemented. 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. Below is a summary of these monitoring programs as described in the 2000 OBMP PEIR and their current status:

Groundwater-level monitoring. The 2000 OBMP estimated that about 500 wells would be initially surveyed for groundwater levels to develop a long-term key-well monitoring program. The 2000 OBMP acknowledged that key wells located in agricultural areas would need to be replaced as necessary if the original well is destroyed when the agricultural land is converted to another use. From 1998 to 2001, Watermaster conducted the initial survey and developed the long-term monitoring program. The current groundwater-level monitoring program consists of about 1,300 wells: about 250 wells are measured by Watermaster at monthly to quarterly frequencies and about 1,050 wells are measured by the owners at various frequencies who then report the data to Watermaster. Exhibit 6 is a map that depicts the existing current groundwater-level monitoring program.

Groundwater-quality monitoring. The 2000 OBMP estimated that about 600 wells would be initially surveyed for groundwater quality to develop a long-term key-well monitoring program. The long-term monitoring program would consist of a minimum set of key wells monitored by Watermaster, but the number of wells was not specified. Additional groundwater-quality data would be obtained from the California Division of Drinking Water. From 1999 to 2001, Watermaster conducted the initial survey and developed a long-term monitoring program. The current groundwater-level quality program consists of about 800 wells: about 150 wells are sampled by Watermaster at quarterly to annual frequencies and about 650 wells are measured by the owners at various frequencies who then report it to the State Water Board's Division of Division Water (DDW). Exhibit 7 is a map that depicts the current groundwater-quality monitoring program.

Groundwater-production monitoring. The 2000 OBMP estimated that in-line totalizing flow meters would be installed at about 300 wells owned by private parties within the Agricultural Pool and assumed that Watermaster staff would visit all active wells in the Agricultural Pool to record groundwater-production data. It also assumed that the Appropriative and Overlying Non-Agricultural Pool well owners, and some Agricultural Pool well owners, would report production records to Watermaster. The groundwater-production monitoring program also included reporting of the sources of water used by each producer and how that water is disposed of after use to enable accurate salt budget estimates per PE 7 and for other water management investigations. Meters were installed at most Agricultural Pools wells by 2003. Currently, Watermaster staff monitors groundwater production at 150 agricultural wells, as well as collecting and compiling groundwater-production data reported by the Appropriative and Overlying Non-Agricultural Pool well owners. Exhibit 8 is a map that depicts the current groundwater-production monitoring program.

Surface-water discharge and quality monitoring. The 2000 OBMP estimated that 16 new water-level sensors would be installed at recharge and retention basins to estimate recharge. These water-level meters were installed in 2005 and are currently used to estimate recharge at these basins. It also assumed that Watermaster would assess the existing surface-water discharge and water-quality programs of the Santa Ana River and Chino Basin tributaries to determine the adequacy of the monitoring for characterizing ambient water quality and the impacts of basin management activities. In 2004 Watermaster implemented a surface-water monitoring program as part the maximum benefit monitoring program; this program has been modified over time with approval from the Regional Board. Currently, the program includes compiling discharge and water quality data from existing POTW discharges and USGS stream gaging stations and collecting grab water quality samples from sites along the Santa Ana River. Exhibit 9 is a map that depicts the current surface-water monitoring program.

Ground-level monitoring. The 2000 OBMP assumed that a network of ground-elevation stations in subsidence-prone areas would be installed and surveyed periodically. Currently, the ground-level monitoring program consists of high-frequency, groundwater-level monitoring at wells, remote-sensing and traditional leveling surveys at benchmarks to monitor vertical ground motion, 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. Exhibit 10 is a map that depicts the existing ground-level monitoring program.

Well construction, abandonment, and destruction. The 2000 OBMP assumed that Watermaster would develop cooperative agreements with the counties of Los Angeles, Orange, Riverside, and San Bernardino to be informed when a new well has been constructed. Additionally, Watermaster would review its well database, make appropriate inspections, consult with well owners, compile a list of abandoned wells, and request that wells be properly destroyed by the owner. Watermaster continues to implement this program. Watermaster has developed cooperative agreements with the 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 testing data.

<u>3.4.3.1.3 OBMPU PE 1 Project Description</u>

Exhibit 4 shows the implementation actions for PE 1 under the OBMPU, which include continuing the ongoing monitoring and reporting program described below and developing and updating an *OBMP Monitoring and Reporting Work Plan*. Implementation of these actions may result in the construction of new monitoring facilities in the Chino Basin as described by monitoring type below. The following summarizes each of the Watermaster's ongoing monitoring and reporting programs, and any new monitoring facilities envisioned in the OBMPU, that are needed to comply with regulations or to meet Watermaster's obligations under its agreements, Court orders, and CEQA. Table 3.2 below is a list of the monitoring and reporting requirements and the associated regulatory entities.

Table 3.2
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					

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 changes, 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 work implemented by Watermaster staff and consultants at private wells and monitoring wells, and cooperative programs to collect, compile, and store data from well owners and other entities 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 comply with regulations and meet

Watermaster's obligations under its agreements, Court orders, and CEQA, it is anticipated that new monitoring wells will need to be constructed. Many of the new monitoring wells will be needed to replace private wells that are currently used for monitoring, but will be destroyed as agricultural lands are converted to urban land uses. Other new monitoring wells will be needed to support regulatory compliance or other Watermaster management initiatives.

Under the OBMPU, up to 100 new monitoring wells will be constructed to monitor groundwater levels in the Chino Basin with total depths ranging from 50 to 1,500 feet and four- to six-inches in diameter. The average area of disturbance of each well site is anticipated estimated to be half an acre or less. Additionally, the ongoing groundwater-level monitoring program will continue. (See Exhibit 6).

Groundwater-quality monitoring. Watermaster's groundwater-quality monitoring program supports many Watermaster management and regulatory-compliance functions including: compliance with the maximum benefit SNMP (refer to P. 34 for a detailed discussion), 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 sampling and analysis programs implemented by Watermaster staff at private wells and monitoring wells, and cooperative programs to collect, compile, and store data from well owners and other entities that conduct groundwater-quality monitoring programs. To continue to comply with regulations and meet Watermaster's obligations under its agreements, Court orders, and CEQA, it is anticipated that new monitoring wells will need to be constructed. Many of the new monitoring wells will be needed to replace private wells that are currently used for monitoring but will be destroyed as agricultural lands are converted to urban land uses. Other new monitoring wells will be needed to support regulatory compliance or other Watermaster management initiatives.

Under the OBMPU, up to 100 new monitoring wells (this is a total of 100 monitoring wells) will be constructed to monitor groundwater quality in the Chino Basin with total depths ranging from 50 to 1,500 feet and four- to six-inches in diameter. The average area of disturbance of each well site is estimated to be half an acre or less. Additionally, the ongoing groundwater-quality monitoring program will continue. Note that monitoring wells can serve a dual purpose by monitoring groundwater levels and providing water quality sampling sites. (See Exhibit 7).

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.

Under the OBMPU, up to 300 in-line flow meters will be installed in agricultural wells to accurately estimate production by the Agricultural Pool. Watermaster's ongoing groundwater-production monitoring program will continue. (See Exhibit 8). This activity is an ongoing management activity being carried out by the Watermaster.

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, evaluating Storage and Recovery Program applications, evaluating MPI, recharge master planning, evaluating Prado Basin habitat sustainability, evaluating compliance with the SWRCB diversion permits, supporting maximum benefit SNMP compliance (refer to P.34), and supporting recycled-water recharge permits compliance. Most of the data 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 surface-water monitoring of the Santa Ana River to comply with the maximum-benefit SNMP.

Under the OBMPU, flow and stage measuring equipment and meteorological monitoring equipment will be installed in and near stormwater drainage and recharge facilities, respectively, to improve the accuracy of surface-water diversion and recharge measurements. Watermaster and IEUA's ongoing surface-water and climate monitoring efforts will continue. (See Exhibit 9). This activity will typically occur within a 10' x 10' area and most often within existing disturbed areas.

Ground-level monitoring. Watermaster's ground-level monitoring program is conducted pursuant to the *Chino Basin Subsidence Management Plan.* The objective of the plan is to minimize or stop the occurrence of land subsidence and groundwater fissuring within the Chino Basin. The ground-level monitoring program is focused across the western portion of Chino Basin within defined Areas of Subsidence Concern—areas of Chino Basin that are susceptible to land subsidence.

Under the OBMPU, up to three extensometers will be constructed in the areas prone to subsidence with a total depth ranging from 50 to 1,500 feet. The extensometers are installed in conjunction with new or existing wells. Watermaster's ongoing ground-level monitoring program will continue. (See Exhibit 10).

Well construction, abandonment, and destruction. Watermaster maintains a database of all 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 appropriate county and state agencies to drill and construct a well and put it into use.

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.

Under the OBMPU, Watermaster will continue these efforts, which will not involve and new or upgraded facilities.

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 PBHSP was created under a Peace II mitigation measure to monitor potential impacts on Prado Basin habitat from implementing hydraulic control. The objective of the PBHSP is to ensure that the groundwater-dependent ecosystem in Prado Basin will not incur unfore-seeable significant adverse impacts due to implementation of the Peace II Agreement. The monitoring program produces time series 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.

Under the OBMPU, Watermaster will continue these efforts, which will not involve any new or upgraded facilities. Since the 2000 OBMP PEIR and related CEQA documents have already evaluated the environmental impacts associated with the OBMP and the OBMPU will simply continue this previously analyzed program component, this activity will be treated as part of the baseline against which the OBMPU is evaluated.

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.

Under the OBMPU, Watermaster will continue these efforts, which will not involve any new or upgraded facilities.

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-water and groundwater models, such as Safe Yield recalculations and RMP updates.

Under the OBMPU, Watermaster will continue these efforts, which will not involve any new or upgraded facilities.

3.4.3.2 Program Element 2. Develop and Implement Comprehensive Recharge Program

3.4.3.2.1 Objectives

The 2000 OBMP included PE 2—*Develop and Implement Comprehensive Recharge Program* — 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. Through the OBMPU process it was determined that the objective of PE 2 remains the same.

3.4.3.2.2 2000 OBMP Project Description and Implementation Progress

The comprehensive recharge program, as described in the 2000 OBMP PEIR, consisted of three phases, (1) to screen and assess potential recharge sites (completed prior to the development of the 2000 OBMP PEIR), (2) to develop engineering and institutional assessments for the sites that passed the screening assessment, including expected recharge rates, cost, etc., and (3) to develop a recharge master plan (RMP) to design, construct, and manage recharge basins. The plan would incorporate recycled water and imported water recharge.

The specific projects described in the 2000 OBMP PEIR included improvements to the Upland, College Heights, Brooks, Eight and Seventh Street, Etiwanda Conservation, Lower Day, Victoria, San Sevaine, Turner, Hickory, Etiwanda Percolation, Jurupa, and Wineville Basins, and the construction of the RP-3 Basins.

Watermaster completed the RMP in 2001. The 2001 RMP and subsequent Recharge Master Plan Updates (RMPU) (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 to discuss the status of recharge projects under construction and potential new projects for inclusion in future RMPUs. The outcomes of the 2001 Recharge Master Plan and subsequent RMPUs (2010, 2013, and 2018) are summarized below:

- 2001 Recharge Master Plan: Watermaster and 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 and conservation 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.
- 2013 RMPU: 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 with a cumulative increase to 14,200 afy.
- 2018 RMPU: The 2018 RMPU did not recommend any new recharge projects. One of the findings of the 2018 RMPU was that Watermaster, based on the best available planning information at that time, had 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 to its diversion permits is expected to be about 15,000 afy.[8] Thus, in the first 20 years of OBMP implementation, average annual stormwater recharge will have increased by about 14,200 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 13,000 afy in 2018. The next RMPU must be completed and submitted to the Court by October 2023. Exhibit 11 shows the recharge basins improvements by recharge master plan effort.

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

There are four managed recharge mechanisms in the Chino Basin:

Recharge basins. Imported water, stormwater, dry-weather flow, and recycled water are recharged at 17 recharge basins. Watermaster has permits from the State Water Resources Control Board (SWRCB) (which are held in trust for Watermaster parties). This allows the parties to divert stormwater and dry-weather flow to the recharge basins for recharge, store it in the Chino Basin, and subsequently recover it for beneficial use.

Aquifer Storage and Recovery (ASR) wells. ASR wells are used to inject treated imported water into the Basin and to pump groundwater. The MVWD owns and operates four ASR wells in the Chino Basin.
In-lieu recharge. In-lieu recharge can occur when a Chino Basin Party with pumping rights in the Chino Basin elects to use supplemental water directly in lieu of pumping some or all its rights in the Chino Basin for the specific purpose of recharging supplemental water.

MS4 facilities. The 2013 RMPU implementation included a process to create and update a database of all known runoff management projects implemented through the Municipal Separate Storm Sewer System (MS4) permits in the Chino Basin. This was done to create the data necessary to evaluate the significance of new stormwater recharge created by MS4 projects. As of FY 2016/2017, a total of 114 MS4 projects were identified as complying with the MS4 permit through infiltration features. These 114 projects have an aggregate drainage area of 1,733 acres.

Table 3.3 below describes the existing recharge capacity in the Chino Basin by source water and recharge mechanism. [9]

Table 3.3
ESTIMATED RECHARGE CAPACITIES IN THE CHINO BASIN

Source Water	Recharge Mechanism	2018 Conditions	2018 Conditions Plus Current Recommended 2013 RMPU Projects	2018 Conditions Plus Current Recommended 2013 RMPU Projects and Restoration of WFA Capacity [10]
Stormwater	Average Stormwater Recharge in Spreading Basins	10,150	14,950	14,950
	Average Expected Recharge of MS4 Projects	380	380	380
	Subtotal	10,530	15,330	15,330

[9] WEI (2018). Recharge Master Plan Update. September 2018.
http://www.cbwm.org/docs/engdocs/2018%20RMPU/20180914_2018_RMPU_final.pdf
[10] The Water Facilities Authority (WFA) Agua de Lejos Treatment Plant (WFA plant) treats imported water purchased from the IEUA at the WFA plant and delivers it to the cities of Chino, Chino Hills, Ontario, and Upland, and to the MVWD. Each of these WFA member agencies has a contracted share of the plant's total capacity of 81 million gallons per day (mgd) (90,700 afy). The WFA plant's current capacity is less than its rated capacity of 81 mgd (90,700 afy) due to solids handling limitations. According to WFA, the current capacity of the WFA plant is about 40 mgd in the summer months and about 20 mgd in the winter months. Based on the estimated recharge capacities developed in the 2018 Recharge Master Plan, restoring the WFA plant to its rated capacity would increase in-lieu recharge capacity in the Chino Basin by about 23,000 afy.

Source Water	Recharge Mechanism	2018 Conditions	2018 Conditions Plus Current Recommended 2013 RMPU Projects	2018 Conditions Plus Current Recommended 2013 RMPU Projects and Restoration of WFA Capacity [10]
Supplemental Water	Spreading Capacity for Supplemental Water	56,600	56,600	56,600
	ASR Injection Capacity	5,480	5,480	5,480
	In-Lieu Recharge Capacity	17,700	17,700	40,900
	Subtotal	79,780	79,780	102,980
Total		90,310	95,110	118,310

3.4.3.2.3 OBMPU Project Description

Exhibit 4 shows the implementation actions for PE 2 under the OBMPU, which include continuing to convene RIPComm, complete the 2023 RMPU and update it no less than every five years thereafter, and implementing recharge projects based on need and available resources. The RMPU process is an ongoing requirement of the Peace Agreement, the Peace II Agreement, and the December 2007 Court Order that approved the Peace II Agreement. The next RMPU is due to the Court by October 2023 and must be updated no less frequently than every five years thereafter.

Through the OBMPU stakeholder process, the Parties expressed interest in maximizing the recharge of recycled, imported, and stormwaters where feasible. Although meeting these objectives is not a requirement for the RMPU, the next (or a future) RMP process could accomplish this by considering projects that will meet other needs of the Parties, such as providing additional recharge capacity for Storage and Recovery Programs and addressing pumping sustainability and land subsidence challenges. 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. Additional improvements to existing facilities and operations and/or new facilities are required to achieve the stormwater recharge potential.
- Using criteria developed by the Watermaster parties, Watermaster and IEUA shall select projects to be implemented only if it is cost effective, for instance a metric could be 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. New evaluation criteria that includes both cost and reliability of the new recharge will be required to increase stormwater recharge.
- The criteria on how and where to conduct recharge needs to be reviewed and updated if it can be demonstrated that recharge can be used to effectively address existing basin

management challenges that include salinity management, land subsidence, maintaining Hydraulic Control, and pumping sustainability. Historically, Watermaster has attempted to manage the recharge of stormwater and supplemental water to promote the balance of recharge and discharge to, in part, address these challenges. Additional investigation needs to be done to determine if recharge improvements can be made to better address these basin management challenges. New evaluation and selection criteria will to be developed that consider both cost and reliability to increase the stormwater available for recharge.

- New recharge facilities and/or improvements to existing facilities will be needed if Parties or others want to increase supplemental water recharge capacity for Storage and Recovery Programs.
- Recharge of recycled and imported water via recharge basins is limited by competing uses for recharge basins for storm, imported and recycled water recharge and by seasonal storage – recycled and imported water supplies in excess of demands tend to be available in the winter, at the same time the recharge basins are being used for stormwater recharge. Thus, groundwater recharge facilities that increase recycled and imported water recharge and storage capacity, specifically during the wintertime should be evaluated.

The new recharge facilities and/or improvements to existing facilities that may result from the RMPU process as envisioned under the OBMPU are listed below and shown on Exhibit 12. The proposed storage facilities would divert surface water to be stored at the proposed facilities. The amount of surface water diverted by the proposed storage and recharge facilities is not presently known, and it would be speculative to estimate at this time. Future surface water diversions to these facilities would depend on future applications to divert surface water to a specific proposed facility, and would require a second tier CEQA evaluation.

- Constructing and operating a new surface water storage basin for stormwater and supplemental waters at the California Institution for Men (CIM), facilities to divert stormwater from Chino Creek to the new storage basin, facilities to convey stormwater and dry-weather flow from the new storage basin to recharge facilities in the northern part of the basin, and facilities to convey supplemental waters to the storage basin.
    - The new storage basin at the CIM would have an area between 50 and 100 acres.
- Constructing flood Managed Aquifer Recovery (MAR) facilities in the northeast part of basin to recharge supplemental water. This assumes that land in existing agricultural uses can be flooded to achieve managed aquifer recharge. The potential cumulative area of these facilities is about 200 acres, the total agricultural land use area in the northern part of the Chino Basin.
- Constructing and operating a new surface water storage basin at the existing Lower Cucamonga Ponds, facilities to divert stormwater and dry-weather flow from Cucamonga Creek to the new storage basin and facilities to convey stormwater from the new storage basin to recharge facilities in the northern part of the basin.
    - The Lower Cucamonga Ponds are an existing detention basin owned by the San Bernardino County Flood Control District. The ponds would be converted into one large conservation facility to store stormwater. It would have an area of about 50 acres.
- Constructing and operating a new surface water storage basin at the existing Mills Wetlands, facilities to divert stormwater and dry-weather flow from Cucamonga Creek to the new storage basin and facilities to convey stormwater from the new storage basin to recharge facilities in the northern part of the basin.

  - The Mills Wetlands are existing artificial wetlands used to treat water from the Cucamonga Creek. The wetlands would be converted into a conservation facility to store stormwater with an area of about 30 acres.
- Constructing and operating a new surface water storage basin at the existing Riverside Basin, facilities to divert stormwater and dry-weather flow from Day Creek to the new storage basin and facilities to convey stormwater from the new reservoir to recharge facilities in the northern part of the basin.
  - The Riverside Basin is an existing detention basin owned by the San Bernardino County Flood Control District. The basin would be converted into a conservation facility to store stormwater with an area of about 60 acres.
- Constructing and operating a new surface water storage basin for stormwater and supplemental waters at the existing Vulcan Basin, facilities to divert stormwater and dry-weather flow from the West Fontana Channel and surrounding urban areas to the new storage basin, facilities to convey stormwater from the new reservoir to recharge facilities in the northern part of the basin, and facilities to convey supplemental waters to the storage basin.
  - The Vulcan Basin is an existing facility formerly used as a sand and gravel mine. The basin would be converted into a conservation facility to store stormwater and has an area of about 60 acres.
- Constructing improvements at the Jurupa Basin that include grading improvements to enable the diversion and storage of storm and supplemental waters, removing fine-grained material from the Jurupa Basin to improve its infiltration rate and increase recharge capacity and improvements at the Jurupa pump station to increase the time the pump station can operate at full capacity. The amount of area that may be impacted has not yet been defined.
- Constructing and operating a new surface water storage basin at the confluence of San Antonio and Chino Creeks (proposed Confluence Project), facilities to divert stormwater and dry-weather flow from of San Antonio and Chino Creeks to the new storage basin and facilities to convey stormwater from the new reservoir to recharge facilities in the northern part of the basin.
  - The Confluence Project would have an area of about 10 acres and a depth of about 35 feet
  - This would result in about 200,000 cubic yards of material removal, with the goal of balancing the cut and fill to minimize material export.
- Constructing improvements to the WFA plant to remove some or all its solids handling limitations and other improvements to increase its capacity to its original design capacity and thereby increase in-lieu recharge capacity.
- Collaborating with the MS4 permittees to ensure MS4-compliance projects prioritize recharge. This would result in the construction of new MS4-compliance facilities that increase recharge in the Chino Basin. No estimate of potential area impacts is available.
- Constructing up to 60 ASR wells to increase supplemental water recharge capacity by up to 70,000 afy. In the case that recycled water is injected into the basin, a subset of these wells would also be injection wells.
  - Depth of new ASR wells could range between 500 and 1,500 feet.
  - The average area of disturbance of each well site is estimated to be half an acre or less.
  - Constructing conveyance facilities to convey the supplemental water to the ASR wells and to convey produced water to end users.
  - Constructing improvements to wastewater treatment plants if recycled water is injected (described in Section 3.3.4.5).

- The expected location of ASR wells is north of Highway 60 in MZ-1, MZ-2 and MZ-3.

As shown in Exhibit 5, some of these facilities help achieve the objectives of PE 4 by creating additional recharge capacity in MZ-1 that could be used to increase piezometric levels in that area (see Section 3.3.3.4). The additional recharge capacity created from these facilities can also help achieve the objectives of PE 5 and PE 8/9, because these facilities can be used to recharge supplemental water to improve water supply reliability and/or implement a Storage and Recovery Program. Finally, these facilities will help address pumping sustainability issues in the JCSD, FWC, and Chino-II Desalter wellfield areas.

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

3.4.3.3.1 Objectives

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 high-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. Through the OBMPU process it was determined that the objective of PE 3 remains the same.

3.4.3.3.2 2000 OBMP Project Description and Implementation Progress

The water-supply plan for impaired areas, as described in the 2000 OBMP PEIR, consisted of two options: a reverse osmosis (RO) only alternative and a RO/ion exchange (IX) alternative. Both alternatives involved the construction of two RO regional desalter facilities with their associated wellfields, expansion of the Chino Desalter Number 1, and construction of water transmission pipelines, brine disposal pipelines and pump stations. The RO/IX alternative would also include an IX treatment train. The wellfields would be located north of the Santa Ana River along the southern portion of the Chino Basin to help maintain Safe Yield by reducing losses to the river. The locations of the groundwater treatment plant would be based on the location of the proposed well fields, proposed product water delivery points and access to the Inland Empire Brine Line for brine disposal. Facility capacities for both RO and RO/IX were based on the assumption that approximately 40,000 afy of poor-quality groundwater would need to be pumped in the southern portion of the Chino Basin in order to maintain Safe Yield value and to prevent approximately 40,000 afy of poor-quality groundwater from discharging into the Santa Ana River. Both facilities would require the installation of approximately 32,000 feet of pipeline ranging in size from 10 to 20 inches in diameter and two pump stations of 200 to 250 Horsepower (HP).

As of January 2020, 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 the Chino-I and Chino-II Desalters that treat the groundwater with RO, IX and air strippers. The treated water is then conveyed to 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 (refer to P.34). This final expansion is expected to be completed by 2021.

The construction and operation of the Chino Basin Desalters became a fundamental component of the Chino Basin maximum benefit SNMP developed pursuant to PE 7. 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 (refer to P. 34) includes nine "maximum benefit commitments." One commitment is the achievement and attainment of Hydraulic 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.

Through the OBMPU process it was determined that no new or upgraded facilities beyond those previously envisioned to achieve PE 3 would be implemented.

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

3.4.3.4.1 Objectives

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. Through the OBMPU process, the objective of PE 4 was refined to: reduce or stop the occurrence of land subsidence and 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 adapting the plan as warranted by data, analyses, and interpretations.

3.4.3.4.2 2000 OBMP Project Description and Implementation Progress

The comprehensive groundwater management plan for MZ-1, as described in the 2000 OBMP PEIR, 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 information necessary to understand the extent, rate, and mechanisms of subsidence and fissuring.
- Formulate a management plan to reduce to tolerable levels or abate future subsidence and fissuring.

The interim management plan for MZ-1 included: (1) a voluntary reduction of production in the deep aquifer system in southern MZ-1 for a 5-year period to evaluate its impacts on subsidence, (2) an effort to balance the recharge and discharge in MZ-1, in part, through the physical recharge of 6,500 afy of Supplemental Water in MZ-1, and (3) an aquifer-system and land-subsidence investigation in the southwestern region of MZ-1 to support the development of a long-term management plan for MZ-1 (second and third bullets above). The investigation was titled the *MZ-1 Interim Monitoring Program* (IMP). [11]

From 2001 to 2005, Watermaster developed and conducted the IMP under the guidance of the MZ-1 Technical Committee, which consisted of the MZ-1 Parties and their technical consultants. The implementation of 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 (Managed Area). The methods, results, and conclusions of the IMP, including the Guidance Criteria, were described in detail in the *MZ-1 Summary Report*.[12] The Guidance Criteria formed the basis for the long-term management plan, documented as the *MZ-1 Subsidence Management Plan* (MZ-1 Plan).[13] To minimize the potential for future subsidence and fissuring in the Managed Area, the MZ-1 Plan recommended that the MZ-1 Parties manage their groundwater pumping pursuant to the Guidance Criteria. 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 (see Exhibit 10).

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. This resulted in the development of the *2015 Chino Basin Subsidence Management Plan* (Subsidence Management Plan)[14] and a recommendation

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

[12] 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

[13] 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

[14] 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

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 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).[15] The Work Plan is an ongoing Watermaster effort and includes a description of a 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 Ground-Level Monitoring Committee (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 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.

Although not specifically described in the 2000 OBMP PEIR, Watermaster has exercised best efforts to arrange for the physical recharge of 6,500 afy of Supplemental Water at the MZ-1 spreading facilities. Although not a party 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 (2030).

3.4.3.4.3 OBMPU Project Description

Exhibit 4 shows the implementation actions for PE 4 under the OBMPU, which include continuing to implement Watermaster's Subsidence Management Plan, and adapt it as necessary, and continuing the physical recharge of at least 6,500 afy of Supplemental Water as an annual average through the term of the Peace Agreement.

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]).

[15] 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

- 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, and revision of the Subsidence Management Plan when appropriate. In this sense, the Subsidence Management Plan is adaptive. 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.

A potential recommendation of the Subsidence Management Plan for Northwest MZ-1 is conducting wet-water and/or in-lieu recharge methods that will result in a net increase in recharge. Interim work performed in Northwest MZ-1 to support the development of a subsidence management plan for this area[16] suggests that land subsidence could be reduced or abated if recharge in Northwest MZ-1 is increased by at least 20,000 afy, pumping is decreased by at least 20,000 afy, or some combination of both totaling about 20,000 afy. Exhibit 13 is a time-series chart of groundwater pumping, wet-water recharge, and land subsidence (represented as negative vertical ground motion) in Northwest MZ-1 from 1978-2019. Recent pumping in Northwest MZ-1 has decreased significantly: 2017-2019 pumping averaged about 12,000 afy compared to about 19,000 afy since the implementation of the OBMP (2001-2016), a reduction of about 7,000 afy. The reduced pumping is mainly due to water quality issues. Additionally, recent wet-water recharge in Northwest MZ-1 has increased: 2017-2019 recharge averaged about 15,000 afy compared to about 9,000 afy since the implementation of the OBMP (2001-2016), an increase of about 6,000 afy. Exhibit 13 shows that these recent decreases in pumping and increases in recharge, totaling about 13,000 afy, appear to coincide with reduced rates of land subsidence in Northwest MZ-1. This suggests that reduced pumping and/or increased recharge can abate land subsidence in Northwest MZ-1. If the Subsidence Management Plan for Northwest MZ-1 recommends a combination of reduced pumping and wet-water recharge to abate ongoing land subsidence, the pumpers in this area who elect to reduce pumping in accordance with the plan may have difficulty in fully utilizing their water rights with existing infrastructure.

Under the OBMPU, facilities may be needed to: (1) relocate pumping from Northwest MZ-1 to MZ-2 and/or MZ-3, (2) replace some of their pumping with surface or recycled water as a form of in-lieu recharge, (3) facilitate increased wet-water recharge, or (4) a combination of some or all of the above. The operation of these facilities would result in increased groundwater levels that would impact the state of Hydraulic Control; thus, facilities and operations would be needed to ensure that Hydraulic Control is maintained.

[16] Chino Basin Watermaster. 2017. *Task 3 and Task 4 of the Work Plan to Develop a Subsidence Management Plan for the Northwest MZ-1 Area: Development and Evaluation of Baseline and Initial Subsidence-Management Alternatives*.

The facilities and/or improvements to existing facilities envisioned under the OBMPU to address land subsidence are listed below and are shown on Exhibit 14.

- Constructing up to 10 wells in MZ-2 and MZ-3 to relocate up to 25,000 afy of pumping from MZ-1 to MZ-2 and/or MZ3.
  - Depth of a new well could range between 500 and 1,000 feet.
  - The average area of disturbance of a well site is anticipated to be half an acre or less.
- Constructing improvements to the WFA Agua de Lejos treatment plant to increase its capacity by up to 25,000 afy and the increase in use of imported water purchased from Metropolitan Water District of Southern California by up to 25,000 afy. Some of the surface water supplied could be obtained through TVMWD and its Miramar treatment plant.[17]
- Constructing up to 15 ASR wells in Northwest MZ-1 and Central MZ-1 to increase wet-water recharge capacity in MZ-1 by up to 25,000 afy. This would require improvements to the WFA Agua de Lejos treatment plant to increase its capacity by up to 25,000 afy and the increase in use of imported water purchased from Metropolitan Water District of Southern California by up to 25,000 afy. Some of the surface water supplied could be obtained through TVMWD and its Miramar treatment plant. [18]
  - Depth of a new ASR wells could range between 500 and 1,500 feet.
  - The average area of disturbance of a well site is anticipated to be half an acre or less.
  - Constructing conveyance facilities to convey the supplemental water to the ASR wells and to convey produced water to end users.
  - Constructing improvements to wastewater treatment plants if recycled water is injected into ASR wells (described in Section 3.3.3.5.3).
  - The expected location of ASR wells is north of Highway 60 in MZ-1.
- Implementing a combination of the facilities and operating concepts to achieve an overall net increase in recharge of 25,000 afy.
- Expanding the existing Chino Desalter capacity by up to 2,000 afy by adding new wells in the Chino Creek wellfield area and expanding the Chino-I and/or Chino-II treatment capacity (see facilities in Section 3.3.3.7.3).

As shown in Exhibit 5, some of these facilities help achieve the objectives of PE 8/9, because these facilities that provide additional recharge capacity in MZ-1 and pumping capacity in MZ-2/3 can be used to implement Storage and Recovery programs.

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

3.4.3.5.1 Objectives

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. Through the OBMPU process it was determined that the objective of PE 5 remains the same.

3.4.3.5.2 2000 OBMP Project Description and Implementation Progress

The regional supplemental water program, as described in the 2000 OBMP PEIR, consisted of expanding the IEUA's recycled water distribution system for recycled water reuse and importing

[17] Note that this project is also discussed under PE 2.
[18] Some of the new ASR wells that will be constructed for PE 2 can be used for PE 4.

potable water from the Bunker Hill Basin for direct use through the expansion of the Baseline Feeder.[19]

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 for direct reuse and indirect potable reuse. 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 reuse, groundwater recharge (indirect potable reuse), 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. Without prejudice to potential future use and distribution of recycled water, IEUA has historically produced and provided recycled water for various purposes depending on a review of its annual recycled water demand priorities. Neither the OBMP nor the proposed OBMPU alter existing rights and responsibilities for the use and distribution of recycled water, whatever they may be, nor do they establish any specific priorities or commitments for future use of recycled water. It is assumed that the amount of recycled water available in the Basin will increase in the future based on forecasts for population growth in the Chino Basin. No portion of this Project prevents the future substitution of new sources of supply to meet the beneficial use requirements that currently receive recycled water. Exhibit 15 shows the location of the IEUA's treatment plants, discharge points to surface water, recharge facilities receiving recycled water, and recycled water distribution pipelines for direct use deliveries.

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 and have been 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 (refer to P.34) 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.

3.4.3.5.3 OBMPU Project Description

Recycled Water Reuse
Exhibit 4 shows the implementation actions for PE 5 under the OBMPU, which include maximizing recycled water reuse and establishing or expanding future recycled water planning efforts to maximize the reuse of all available sources of recycled water.

[19] Note that the Baseline Feeder was not specifically identified as an implementation action in the 2000 OBMP Implementation Plan and has not been implemented.

The IEUA is continuing to expand its recycled-water distribution system and recharge facilities throughout the Chino Basin for direct non-potable reuses and recharge. Growth is still occurring in the Chino Basin and will result in additional wastewater flows to the IEUA's treatment plants and an increase in recycled water production. The new recycled water will be used to meet part of the demand created by urban growth.

The facilities and/or improvements to existing facilities to maximize recycled water reuse envisioned under the OBMPU are listed below and shown on Exhibit 16.

- Constructing an advanced water treatment plant.[20] The area expected to be disturbed by the construction and operation of the plant is 10-20 acres. The location of the treatment plant is currently unknown and it could be collocated at an existing IEUA Water Reclamation Plant (WRP). This facility was previously evaluated in the 2017 FMP PEIR and data will be brought forward into this document.
- Expanding the recycled water distribution systems for indirect potable reuse by constructing up to 100,000 lineal feet (LF) of pipelines of various diameters in the shaded regions shown on Exhibit 16.
- Conducting direct potable reuse (DPR) that will require the construction of the advance water treatment plant described in the first bullet and conveyance facilities to move the product water to the potable system, preferably using existing potable water line(s) within the general area.
- Acquiring surplus recycled water supplies from other entities and constructing conveyance facilities to distribute the water to the Chino Basin. IEUA has evaluated one specific program for transfer of recycled water from Pomona to the Montclair Basins area.

As shown in Exhibit 5, some of these facilities help achieve the objectives of PE 7 by removing salts from the basin through advanced treatment of recycled water.

Water Reliability
Exhibit 4 shows the implementation actions for PE 5 under the OBMPU, which include maximizing recycled water reuse and establishing or expanding future integrated water resources planning efforts to address water supply reliability for all Watermaster Parties.

As described above (see Table 3.1), 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 was observed during the development of PEs 3 and 5 in the 2000 OBMP. 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 challenges, 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 the use of imported water include the reliability of the individual imported sources and infrastructure required to convey it to the Chino Basin and the local capacity to treat it if required for municipal use

[20] Advanced water treatment refers to the following waste water treatment processes: RO, membrane filtration, or functionally equivalent processes, and potentially ultraviolet (UV) disinfection.

- The reliability of non-Chino Basin groundwater supplies depends on water quality, water rights, and infrastructure to convey the supplies to a Parties' water system.
- The reliability of local surface water supplies 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.
- The challenges to maximizing the reuse of recycled water include the timing of recycled water demands, 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 expected to result in higher temperatures, longer dry periods, and shorter more intense wet periods, which is expected to 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 and replenishment.

The facilities and/or improvements to existing facilities to improve water reliability envisioned under the OBMPU are listed below and shown on Exhibit 17.

- Constructing conveyance facilities to enable the distribution of future imported water supplies. The amount of new pipeline needed has not yet been defined.
- Constructing an east to west 75,000-lineal foot regional pipeline across the northern part of the Chino Basin to enable the efficient conveyance and distribution of basin waters to Chino Basin water users; and or the construction of improvements to existing conveyance facilities to accomplish the same.
- Constructing a north-to-south 45,000-lineal foot regional pipeline across the eastern part of the Chino Basin to enable the efficient conveyance and distribution of basin waters to Chino Basin water users; and or the construction of improvements to existing conveyance facilities to accomplish the same.

As shown in Exhibit 5, the new supplemental supplies and facilities contribute to achieving the objectives of PE 8/9.

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

<u>3.4.3.6.1 Objectives</u>

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. Through the OBMPU process, the objective of PE 6 was refined to: 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.

3.4.3.6.2 2000 OBMP Project Description and Implementation Progress

The cooperative programs to improve basin management, as described in the 2000 OBMP PEIR, consisted of working cooperatively with the Regional Board and other agencies, to identify water quality anomalies through monitoring, assist in determining sources of the water quality anomalies, and establish priorities for clean-up.

Through its own monitoring at private 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 Watermaster convened a Water Quality Committee 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 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; identification of sources and responsible parties for the South Archibald plume; 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[21] 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 actions that include the use of the Chino Basin Desalters describe in PE 3 (see Section 3.3.4.3) 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 2000 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 the remediation of the Chino Airport and South Archibald plumes.

3.4.3.6.3 OBMPU Project Description

Exhibit 4 shows the implementation actions for PE 6 under the 2020 OBMP which include re-convening the water quality committee, developing and implementing an initial emerging

[21] 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.

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

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; track and report on the status of plumes and remediation in the recurrent plume status reports; and other ad-hoc investigations needed to support the Regional Board in their efforts to address groundwater contamination. Watermaster will continue to support the Regional Board and other parties to identify and implement mutually beneficial projects for addressing groundwater contamination cleanup and identify funding opportunities to help pay for the cleanup efforts. Watermaster will continue to characterize and report on water-quality in the biennial State of the Basin Reports using data collected for the PE 1 Groundwater Quality Monitoring Program. Watermaster will also develop a *Groundwater Quality Management Plan* as 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.

Exhibits 18 through 21 show the most current characterization of regulated drinking water contaminants in the Chino Basin. Exhibit 18 shows the locations of active municipal supply wells and symbolizes them based on the number of regulated drinking water contaminants that have been detected in exceedance of their respective primary maximum contaminant levels (MCLs). Of the 141 recently active municipal supply wells, 45 have at least one drinking water contaminant, 17 wells have two contaminants, 14 have three contaminants, five have four contaminants, and five have five contaminants. The wells with regulated drinking water contaminants are primarily located in the southern (south of the 60 freeway) and western (west of Euclid Avenue) areas of the Basin. Exhibits 19 through 21 show the spatial distribution of the maximum observed nitrate, 1,2,3-TCP, and perchlorate concentrations – the three most prevalent contaminants in the Chino Basin – at all wells for the five-year period of 2014 to 2018.

Several of the drinking water contaminants found in the Chino Basin are associated with known point-source contaminant discharges to groundwater. Characterizing and understanding point-sources contaminant sites are critical to the overall management of groundwater quality to ensure that Chino Basin groundwater remains a sustainable resource. Watermaster closely monitors the status, decisions, cleanup activities, and monitoring data pertaining to point-source contamination within the Chino Basin. The following is a list of the regulatory and voluntary point-source contaminant sites in the Chino Basin that are tracked by Watermaster, the locations of which are shown in Exhibit 22.

Table 3.4
POINT-SOURCE SITES TRACKED BY WATERMASTER

Site Name	Constituents of Concern	Order
Alumax Aluminum Recycling Facility	TDS, sulfate, nitrate, chloride	Regional Board Cleanup and Abatement Order 99-38
Alger Manufacturing Co	volatile organic chemicals (VOCs)	Voluntary Cleanup and Monitoring
Chino Airport	VOCs	Regional Board Cleanup and Abatement Orders 90-134, R8-2008-0064, and R8-2017-0011
California Institution for Men	VOCs	Voluntary Cleanup and Monitoring (No Further Action status, as of 2/17/2009)
GE Flatiron Facility	VOCs and hexavalent chromium	Voluntary Cleanup and Monitoring
GE Test Cell Facility	VOCs	Department of Toxic Substances Control (DTSC) Consent Order Docket No. 88/89-009CO. Regional Board Status of Open-Verification Monitoring
Former Kaiser Steel Mill	TDS, total organic carbon (TOC), VOCs	Regional Board Order No. 91-40 Closed. Kaiser granted capacity in the Chino II Desalter to remediate
Former Kaiser Steel Mill – CCG Property	chromium, hexavalent chromium, other metals, VOCs	DTSC Consent Order 00/01-001
Milliken Sanitary Landfill	VOCs	Regional Board Order No. 81-003
Upland Sanitary Landfill	VOCs	Regional Board Order No 98-99-07
South Archibald Plume	VOCs	Stipulated Settlement and Cleanup and Abatement Order No. R8-2016-0016 to a group of eight responsible parties
Stringfellow Site National Priorities List (NPL) Superfund Site	VOCs, perchlorate, N-nitrosodimethylamine (NDMA), trace metals	United States Environmental Protection Agency (USEPA) Records of Decision (RODs): R09-83/005, R09-84/007, R09-87/016, and R09-90/048.

Finally, tracking emerging contaminants that are being considered for regulation and performing monitoring to characterize their occurrence in the Chino Basin will help to identify and plan for optimal solutions to manage groundwater quality for drinking water supply. Exhibit 23 shows the occurrence of two emerging contaminants that may be regulated in the future – the per-and polyfluoroalkyl substances (PFAS) compounds — perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) — in groundwater and some blending sources for the recycled water recharge in the Chino Basin as of March 2019, based on all monitoring performed since 1998. The exhibit shows that the majority of wells in the Chino Basin have not been sampled for PFOA and/or PFOS. The 30 wells in the Chino Basin that have been sampled for PFOA and PFOS were tested using the laboratory detection limits four and eight times higher than the current notification levels (NLs) for these emerging contaminants. Monitoring of recycled water recharge blending sources shows that many of the sources sampled have detectable concentrations of PFOA and PFOS, and many are above the NLs. The EPA and the DDW have both indicated that they are moving forward with the process to adopt MCLs for PFOA and PFOS in the near future. The occurrence of PFOA and PFOS in Chino Basin groundwater as of March 2019 is not well characterized at concentrations equivalent to or below the current NLs, and there are recharge water sources with concentrations of PFOA and PFOS above the NLs.

The facilities and/or improvements to that may be implemented based on the recommendations of the *Groundwater Quality Management Plan* to address the contaminants described herein and other contaminants are listed below.

- Constructing water treatment facilities at well sites or at sites near to wells to treat groundwater to meet drinking water standards for local use.
    - The area expected to be disturbed by the construction and operation of the treatment facilities would be limited to existing well sites if the plant is located at an existing well site; and will range from about 0.5 acres to 2 acres per facility for new treatment facilities located near a well site. The locations of these treatment facilities are currently unknown.
- Constructing regional water treatment facilities taking groundwater from multiple wells to treat groundwater to meet drinking water standards for local use and or export.
    - The area expected to be disturbed by the construction and operation of the treatment facilities is expected to be less than 20 acres per facility. The locations of the treatment facilities are currently unknown.
- Constructing improvements at existing treatment facilities to treat contaminated groundwater to drinking water standards for local use.
- Constructing conveyance facilities to convey the untreated groundwater to the treatment facilities and to convey treated water from the treatment facilities to water users.

3.4.3.7 Program Element 7. Develop and Implement Salt Management Plan

3.4.3.7.1 Objectives

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. Through the OBMPU process, the objective of PE 7 was refined to: implement, and periodically update, the maximum benefit SNMP. The maximum benefit SNMP is a Regional-Board-approved management program incorporated into the Water Quality Control Plan for the Santa Ana River Basin (Basin Plan) to monitor, characterize, and address 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.

3.4.3.7.2 2000 OBMP Project Description and Implementation Progress

The salt management plan, as described in the 2000 OBMP PEIR, consisted of computing a salt budget for existing conditions as the baseline, developing alternatives to reflect the OBMP Implementation, and computing the salt budget for these alternatives to ensure that Watermaster reduced the salt loading then projected to occur in the Chino Basin.

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) defining a new groundwater quality management zone that encompasses the northern parts of MZ-1, MZ-2 and MZ-3 called the Chino-North GMZ, (2) establishing TDS and nitrate objectives for the Chino-North GMZ[22] to

[22] 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.

numerically higher values than established for MZ-1, MZ-2 and MZ-3 to enable maximization of recycled water reuse and (3) 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 in the 2000 OBMP through implementation actions within PEs 1, 2, 3, 5, and 7.

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-based 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.[23]

3.4.3.7.3 OBMPU Project Description

Exhibit 4 shows the implementation actions for PE 7 under the OBMPU, which include (1) completing the 2020 update of TDS and nitrate projections to evaluate compliance with maximum benefit SNMP and, if necessary, based on the outcome, preparing a plan and schedule to implement a salt offset compliance strategy,[24] (2) continuing to implement the maximum-benefit SNMP pursuant to the Basin Plan (see list below), and (3) starting in 2025 and every five years thereafter, updating water quality projections to evaluate compliance with the maximum-benefit salt and nutrient management plan.

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 Plan, and thus PE 7, will include:

- Implementing monitoring program and reporting requirements
- Maintaining Hydraulic Control through operation of the Chino Basin Desalters and other means, as necessary
- Increasing and maintaining desalter pumping at 40,000 afy
- Continuing storm and imported water recharge program to comply with recycled water recharge dilution requirements
- Complying with recycled water TDS and TIN limitations
- Computing ambient water quality every three years
- Constructing treatment and/or salt offset facilities if one or more of the compliance limits are 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 24.

The management actions for achieving compliance with the metrics once the action level is reached 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), additional desalting of high-TDS groundwater as a salt offset or combination of the above.

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 have been exceeded. That said, the ambient TDS and nitrate concentrations in the Chino-North GMZ continue to increase due to legacy agricultural activities and current irrigation practices regardless of water source. The current ambient TDS and nitrate concentrations are 360 and 10.3 mgl, respectively. Based on the rate of increase of the ambient

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

[24] 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. It could also include: new regulatory compliance metric based on a longer-term averaging period for recycled water TDS

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[25] 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. It is expected that future droughts, the duration and frequency of which could be exacerbated by climate change, could potentially threaten compliance with the existing permit 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 2021.

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[25] The TDS concentration of wastewater that is treated at a given reclamation plant is higher than the source water TDS concentration served in the sewer shed tributary to the reclamation plant. The TDS "waste increment" is the increase in the TDS concentration, measured in mgl, that occurs due to indoor water use activities (showering, toilet flushing, laundry, etc.). Indoor water conservation measures that reduce indoor water use volumes can increase the TDS waste increment because the same mass of TDS additions from the indoor activities are being disposed of with a smaller volume of water.

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, proactive planning to achieve compliance is a required ongoing activity under PE 7 and the maximum benefit SNMP.

If compliance with the maximum benefit limitations were to become an issue, and/or if changes in basin management and operation as described herein impact the ability to maintain Hydraulic Control, the facilities and/or improvements to that may need to be implemented are listed below and shown on Exhibit 25.

- Constructing a new treatment train at one or more IEUA recycled water treatment plants (RP-1, RP-4, RP-5, CCWRF) to reduce the TDS concentration of recycled water to levels that ensure compliance with IEUA and Watermaster's recycled water permits. The area disturbed during construction of the new treatment train capacity expansion would be limited to the disturbed areas at IEUA's existing recycled water treatment plants.
- Constructing an advanced water treatment plant (see Section 3.4.3.5.3).
- Expanding the existing Chino Desalter capacity by up to 6,000 afy by adding new wells and either expanding the Chino-I and/or Chino-II treatment capacity or constructing a new treatment facility and product water conveyance facilities.
  - The area disturbed during construction of the treatment plant capacity expansion would be limited to the disturbed areas at the existing Chino Desalter treatment plant sites.
  - Developing 6,000 afy of new groundwater supply
    - Constructing up to eight wells in the existing desalter well field areas to increase pumping up to 6,000 afy to maintain Hydraulic Control and to mitigate reductions in net recharge and Safe Yield caused by land subsidence management and Storage and Recovery Programs. Well depths could range from 250 to 1,000 feet. The average area of disturbance of a well site is anticipated to be half an acre or less.
    - Acquiring up to five existing wells in in the Chino Creek well field area that, in aggregate, can pump up to 2,000 afy to maintain Hydraulic Control.
    - Combination of constructing new and acquiring existing wells up to a pumping capacity of 6,000 afy to maintain Hydraulic Control and to mitigate reductions in net recharge and Safe Yield caused by land subsidence management and Storage and Recovery Programs.
    - Constructing brine management facilities.
- Construct a new treatment plant, new wells, and new conveyance facilities to accomplish the same effect as described above to expand the existing Chino Desalter system capacity by up to 6,000 afy.

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

3.4.3.8.1 Objectives

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. Through the OBMPU process, the objectives of PEs 8 and 9 have been refined to:

- PE 8: Implement, and periodically update, a storage management plan that: (1) is based on the most current information and knowledge of the basin, (2) prevent unauthorized overdraft, (3) prioritize 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.
- PE 9: Support the development and implementation of Storage and Recovery Programs in the Chino Basin that provide defined benefits to the Parties and the basin.

3.4.3.8.2 2000 OBMP Project Description and Implementation Progress

The groundwater storage management program described in the 2000 OBMP PEIR considered, four potential methodologies for setting storage limits that included: (1) deducting rising water losses from planned storage for all local storage accounts and for the storage accounts of non-Judgment parties, (2) establishing arbitrary storage limits, such as a multiple of the Safe Yield, (3) limiting storage based on the time that water is in storage, such as not being able to store water for more than 10 years and (4) limiting storage based on total storage and the time that water is in storage. Under all methodologies, Parties would sell their current year underproduction to Watermaster or other parties to the Judgment each year if their local storage accounts are full, and the water would then be used to meet Replenishment Obligations. The conjunctive use programs, as described in the 2000 OBMP PEIR, consisted of (1) completing the existing short-term conjunctive-use project, (2) seasonal peaking program for in-basin use and dry-year yield program to reduce the demand on various water supply entities to 10 percent of normal summer demand (requiring 150,000 acre-ft of storage), (3) dry-year yield export program, and (4) seasonal peaking export program.

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 five types of storage accounts: Excess Carryover, Local Supplemental-Recycled, Local Supplemental-Imported, Pre-2000 Quantified 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. 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” (§5.2(c)(iv)(b) of the Peace Agreement). 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. The losses assessed by Watermaster are based on the amount of water in managed storage (excluding Carryover) and they offset the increase in groundwater discharge to the Santa Ana River from the Chino Basin attributable to managed storage (excluding Carryover). Watermaster also assesses losses due to evaporation on the puts when water is recharged in spreading basins.

In evaluating applications for storage agreements, Watermaster must conduct an investigation to determine if the water stored and recovered under a proposed storage agreement has the potential to cause MPI to a Party or the basin. If Watermaster determines that implementation of the proposed storage agreement has the potential to cause MPI, the applicant must revise its application and demonstrate that there will be no MPI, or Watermaster must impose conditions in the storage agreement to ensure there is no MPI. Watermaster cannot approve a storage agreement that has the potential to cause 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 2000 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 keeps a record of 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 Implementation Plan, 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 26 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.

3.4.3.8.3 OBMPU Project Description

Exhibit 4 shows the implementation actions for PE 8/9 under the OBMPU, which include (1) complete and submit to the Court the 2020 Safe Yield Recalculation, (2) completing and submitting to the Court the 2020 Storage Management Plan (SMP), (3) developing 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, (4) assessing losses from storage accounts based on the findings of the 2020 Safe Yield Recalculation, (5) updating the Storage Management Plan, (6) perform safe yield recalculation every 10 years (2030, 2050), and (7) updating the storage loss rate following each recalculation of Safe Yield (2030, 2040, 2050) and during periodic updates of the SMP.

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 use of storage space beyond that anticipated in the 2000 OBMP and Peace Agreement implementation plan. 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 to managed storage activities; and groundwater model-based projections of the basin response to future management plans where the managed storage exceeded the SSC of 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*[26] (SFI) was completed in 2018 to provide technical information required to update the 2000 OBMP storage management plan that is included in the Peace Agreement implementation plan. In the SFI, future projections of the use of managed storage[27] were estimated and evaluated for potential MPI and other adverse impacts[28]. 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 and adverse impacts. The results of the SFI, together with the *Final 2020 Storage Management Plan White Paper,* [29] were used to inform the development of the *2020 Storage Management Plan* (SMP).

The Watermaster completed the 2020 SMP in December 2019. 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 activities (includes Carryover, Excess Carryover, and Supplemental Accounts) and Metropolitan's DYYP. This amount is referred to as the "First Managed Storage Band" (FMSB).
- 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:

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[26] WEI. (2018). *Storage Framework Investigation – Final Report*. Prepared for the Chino Basin Watermaster. October 2018.
[27] Managed storage refers to water stored by the Parties and other entities and includes Carryover, Local Storage, and Supplemental Water held in storage accounts by the Parties and for Storage and Recovery Programs.
[28] Adverse impacts include and are not limited to reductions in net recharge and Safe Yield and increases in groundwater discharge from the Chino North GMZ to the Santa Ana River that have the potential to cause a loss of Hydraulic Control.
[29] WEI. (2019). *Final 2020 Storage Management Plan White Paper*. Prepared for the Chino Basin Watermaster. July 2019.

- 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 Program impacts, assess MPI (including, but not limited to land subsidence, pumping sustainability, water quality, 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 evaluate the Storage and Recovery Program, assess adverse impacts (including, but not limited to reductions in net recharge and Safe Yield and an increase in the groundwater discharge from the Chino North GMZ to the Santa Ana River contributing to a loss of Hydraulic Control), 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 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.

The facilities and/or improvements to existing facilities envisioned under the OBMPU to conduct a Storage and Recovery Program within the SMP are listed below and shown on Exhibit 27.

- Constructing up to 40 new ASR wells and/or 30 new conventional production wells in MZ-2/3 north of Highway 60 to increase pumping and recharge capacity by up to 70,000 afy to implement Storage and Recovery programs. [30]
  - Depth of new wells could range between 500 and 1,500 feet.
  - The average area of disturbance of a site is anticipated to be half an acre or less.
  - Constructing conveyance and treatment facilities to supply water to the ASR wells for recharge.
  - Constructing conveyance and treatment facilities to supply the recovered stored groundwater from the ASR wells to municipal and industrial users within and outside of the Chino Basin.
- Expanding the Chino Desalters or construction of new functionally equivalent facilities (see Section 3.3.4.7.3) to mitigate increases in groundwater discharge from the Chino North GMZ to the Santa Ana River caused by a Storage and Recovery Program that has the potential to cause a loss of Hydraulic Control. These same facility improvements could be used to mitigate the loss of net recharge and Safe Yield caused by a Storage and Recovery Program.
- Constructing facility improvements at active groundwater remediation projects to mitigate the effects of Storage and Recovery Program on the remediation projects (see Section 3.3.4.6.3). These improvements could include construction of additional wells and raw water conveyance facilities, treatment plant expansions and other treatment modifications and product water facilities
- Constructing replacement wells and or modification to existing wells to mitigate loss of pumping capacity caused by a Storage and Recovery Program.

3.5 SUMMARY OF ALL FACILITIES

The 2020 OBMPU and related documents is a revision of the implementation plans included in the Peace and Peace II Agreements and incorporates the new activities in the 2020 OBMPU and ongoing activities from the 2000 OBMP. The 2020 OBMPU IP puts forth a series of one-time actions and ongoing management processes, organized by Program Elements (PE), that help achieve the goals of the OBMP and set the framework for the next 30 years of basin-management activities. This section of the Project Description is intended to outline the specific facilities and specific types of facilities and/or improvements that could result from the implementation of the OBMPU, and to provide operational and construction scenarios for OBMPU related equipment and facilities. These facilities are listed in Exhibit 5 and are outlined in further detail below.

The implementation of the facilities proposed as part of the OBMPU consists of construction and operation of the various facilities that will be summarized below. These potential facilities are separated into four project categories: (1) Project Category 1: Well Development and Monitoring Devices; (2) Project Category 2: Conveyance Facilities and Ancillary Facilities; (3) Project Category 3: Storage Basins, Recharge Facilities, and Storage Bands; and, (4) Desalters and

[30] Some of the new conventional pumping wells and ASR that will be constructed for PE 2 and 4, respectively, can be used for PE 8/9.

Water Treatment Facilities. Below are general descriptions of the facilities and operations proposed as part of the OBMPU.

Project Category 1: Well Development and Monitoring Devices
This Project Category includes the development of ASR, injection, pumping, groundwater level monitoring, and groundwater quality wells, associated well housing, as well as monitoring devices such as flow meters and extensometers. The proposed wells and monitoring devices will be installed throughout the Chino Basin.

Well development includes up to 60 new ASR wells, 10 wells relocated to adjust up to 25,000 afy of pumping, and 8 new wells to expand desalter capacity for a total of 78 new wells. In addition, the OBMPU anticipates reconstruction and/or modification of up to 5 wells to mitigate loss of pumping capacity, and destruction and replacement of 5 wells. This category also includes the development of 100 monitoring wells, for a total of up to 178 wells, which serve the varying purposes listed above and outlined below. The monitoring devices proposed as part of the OBMPU include up to 300 flow meters, up to 100 transducer data loggers, and 3 extensometers installed in existing private wells.

Project Category 2: Conveyance Facilities and Related Infrastructure
This category includes the construction of up to 550,000 LF of new pipelines, booster pump stations, reservoirs and minor appurtenances whose number, locations and capacities are presently unknown. The proposed conveyance facilities and ancillary facilities would be implemented throughout the entire Chino Basin.

Project Category 3: Storage Basins and Recharge Facilities and Storage Bands
This Project Category includes the construction of up to 310 acres of new storage basins—several locations for which are within existing facilities, improvements to existing storage basin(s), 200 acres of flood MAR facilities, new MS4-compliance facilities, and expansion of the maximum storage space (safe storage capacity) to be used within the Chino Basin from 600,000 af (through June 30, 2021) to between 700,000 af and 1,000,000 af going forward with various impacts that may result for each 100,000 af within this range of storage. The specific locations of the new and existing storage basins are described in the Project Description, above; however, the locations of the flood MAR facilities and MS4 compliant projects are presently unknown.

Project Category 4: Desalters and Water Treatment Facilities
The projects proposed under this category are: upgrades at IEUA's existing Treatment Plants (previously analyzed in IEUA's 2017 FMP PEIR), a new advanced water treatment plant (previously analyzed in IEUA's 2017 FMP PEIR), improvements to the WFA Agua de Lejos Treatment Plant, upgrades to the Chino Desalters, new groundwater treatment facilities at or near well sites and at regionally located sites, and improvements to existing groundwater treatment facilities. Impacts related to the facilities thoroughly analyzed as part of the IEUA's 2017 FMP PEIR are assumed to be part of the baseline and will not be analyzed further as part of the OBMPU.

<u>Operational Scenarios</u>
As part of this summary of all facilities, possible operational scenarios are provided as part of the discussion of each type of facility. The future modes of operation (activities) are provided to enable evaluation of the direct and indirect environmental impacts that could result from OBMPU implementation. These are representative scenarios that describe a range of plausible future operations and activities, based on the past activities carried out in the Chino Basin to implement

the original OBMP Program Elements, and are a reasonable estimate of future operations based on the information available at this time.

Construction Scenarios

Secondarily, as part of this summary of all facilities, estimated construction scenarios are provided as part of the discussion of each type of facility. The purpose of the following general construction scenarios is to assist the reviewer to understand how the proposed facilities will be installed, the amount of time required for their construction, and potential direct and indirect environmental impacts. This information also provides essential data for making the program air quality impact forecasts using the most current CalEEMod emission forecast model.

For many of the facilities anticipated by the OBMPU, the types, configuration and exact location of future specific projects that may be constructed in support of the OBMPU have not been determined. However, there are a few specific Projects that have been identified at a sufficient level of detail that a location has been pinpointed in which a specific project will be developed. For instance, the CIM Storage Basin Project is proposed to be located at the CIM; however, the Project specifications at that site have not yet been identified. For the remaining projects listed below, it is possible to foresee some of the infrastructure that is likely to be constructed and to project the reasonably foreseeable direct and indirect impacts that would result from construction and operation of the infrastructure. Impacts associated with specific future projects could be evaluated in second-tier CEQA evaluations to determine if the actual impacts fall within the impacts forecast by this analysis, or require subsequent CEQA evaluations and determinations. These evaluations would be conducted under Section 15162 of the State CEQA Guidelines.

3.5.1 Project Category 1: Well Development and Monitoring Devices

3.5.1.1 Monitoring Wells and Devices: Facilities Summaries & Operational Scenarios

Groundwater-Level Monitoring, Wells (PE1). Under the OBMPU, up to 100 new monitoring wells will be constructed to monitor groundwater levels in the Chino Basin, which would meet the objective of **PE1** by providing the information necessary to support the implementation of all other OBMP PEs and to evaluate their performance.

Groundwater-Level Monitoring, Wells: Summary of Facilities

The average area of disturbance of each well site is anticipated estimated to be half an acre or less, while the total depth of each well is anticipated to range from 50 to 1,500 feet. The precise location of the proposed new wells is unknown at this time, beyond that they will be located within the Chino Basin, shown on Exhibit 6. The new monitoring wells will be equipped with pressure transducer data-loggers that measure and record groundwater levels.

Groundwater-Level Monitoring, Wells: Operational Scenario

Wells will be visited by a field technician on a monthly to quarterly frequency. There is negligible energy consumption in obtaining groundwater levels from a monitoring well.

Groundwater-Quality Monitoring (PE1). Under the OBMPU, up to 100 new monitoring wells will be constructed to monitor groundwater quality in the Chino Basin, which would meet the objective of **PE1** by providing the information necessary to support the implementation of all other OBMP PEs and to evaluate their performance. The groundwater quality monitoring wells and groundwater level monitoring wells can be utilized interchangeably for both types of monitoring activities.

Groundwater-Quality Monitoring: Summary of Facilities

The average area of disturbance of each well site is estimated to be half an acre or less while the total depth of each well is anticipated to range from 50 to 1,500 feet and four- to six-inches in diameter. Additionally, the ongoing groundwater-quality monitoring program will continue. The precise location of the proposed new wells is unknown at this time, beyond that they will be located within the Chino Basin, shown on Exhibit 7. A subset of the new monitoring wells will be equipped with probes that measure and record water-quality parameters.

Groundwater-Quality Monitoring: Operational Scenario

Wells will be visited by a field technician on a monthly to quarterly frequency. There is negligible energy consumption in obtaining groundwater quality samples from a monitoring well.

Groundwater-Production Monitoring (PE1). Under the OBMPU, Watermaster's ongoing groundwater-production monitoring program will continue, which would meet the objective of **PE1** by providing the information necessary to support the implementation of all other OBMP PEs and to evaluate their performance. Up to 300 in-line flow meters will be installed in existing private wells to accurately estimate production by the Agricultural Pool.

Groundwater-Production Monitoring: Summary of Facilities

The flow meters are installed on the existing well discharge pipe. The proposed/possible locations for the in-line flow meters on Agricultural Pool wells are shown on Exhibit 8.

Groundwater-Production Monitoring: Operational Scenario

Agricultural pumping wells will be visited by a field technician on a monthly to quarterly frequency to read up to 300 in-line flow meters. There is negligible energy consumption for accessing and reading the meter.

Surface Water and Climate Monitoring (PE1)

Under the OBMPU, Watermaster and IEUA's ongoing surface-water and climate monitoring efforts will continue, which would meet the objective of **PE1** by providing the information necessary to support the implementation of all other OBMP PEs and to evaluate their performance. Surface-water discharge and stage measuring equipment and meteorological monitoring equipment will be installed in and near stormwater drainage and recharge facilities, respectively, to improve the accuracy of surface-water diversion and recharge measurements.

Surface Water and Climate Monitoring: Summary of Facilities

The surface-water discharge equipment will consist of flow meters, data loggers and communications equipment that measure flow rate at discrete points along creeks, and inlets and outlets of existing recharge facilities, store the measure data and transmit it to IEUA's SCADA system. The surface-water stage monitoring equipment will consist of pressure transducer data-loggers and communications equipment that measure and record water levels, store the measurement data and transmit it to IEUA's SCADA system. The meteorological monitoring equipment will be similar to the California Irrigation Management Information System (CIMIS) stations and include data loggers and communications equipment. The potential locations for the installation of surface-water and climate monitoring devices are shown on Exhibit 9.

Surface Water and Climate Monitoring: Operational Scenario

Flow and stage measuring equipment and meteorological monitoring equipment will be visited by a field technician on a monthly to quarterly frequency to download data and service the equipment.

The monitoring equipment will likely be powered by a solar panel and connected to a telemetry system.

Ground-Level Monitoring, Extensometers (PE1)

Under the OBMPU, Watermaster's ongoing ground-level monitoring program will continue, which would meet the objective of **PE1** by providing the information necessary to support the implementation of all other OBMP PEs and to evaluate their performance. Up to three new extensometers will be constructed in the areas prone to subsidence with total extensometer depths of up to 1,500 feet.

Ground-Level Monitoring, Extensometers: Summary of Facilities

An extensometer is a sophisticated monitoring facility consisting of piezometers and extensometers. As the aquifer system undergoes various stresses due to groundwater production and recharge, the facility monitors the hydraulic response of the aquifer system at the piezometers and the mechanical response of the aquifer system at the extensometers. The facility is equipped with pressure transducers to measure water levels in the piezometers, linear potentiometers to measure the vertical aquifer-system deformation at the extensometers, and data loggers to record the data at frequent intervals (e.g. 15 minutes). The possible locations of the extensometers are within the Areas of Subsidence concern shown on Exhibit 10.

Ground-Level Monitoring, Extensometers: Operational Scenario

Wells with extensometers will be visited by a field technician on a monthly to quarterly frequency to download data and service the equipment. The extensometer will likely be powered by a solar panel and connected to a telemetry system.

3.5.1.2 Monitoring Wells: Construction Scenario

The OBMPU estimates that about up to 100 monitoring wells will be installed to monitor groundwater levels and groundwater quality, which can be used interchangeably for both purposes. It is assumed that up to 20 monitoring wells may be developed in a single year. Development of each new monitoring wells during a given year will require the delivery and set up of the drilling rig. It is anticipated these wells will be drilled at different times and the drilling equipment will be transported to and from the sites on separate occasions. For the purposes of this evaluation, it is forecast that delivery of the drilling equipment 20 times in a year will result in twenty 50-mile round-trips.

Monitoring well development has essentially the same construction impacts as production well development, except it does not require test pumping, discussed under **3.5.1.4 ASR, Injection and Pumping Wells**, below.

3.5.1.3 Monitoring Devices: Construction Scenario

The installation of up to 300 in-line flow meters and up to 100 transducer data loggers will require one round-trip per device, or a total of 400 round trips over an undefined period of time. These trips are anticipated to occur within the Basin, as such the average round-trip length to install one in-line flow meter is anticipated to be 40 miles. For analysis purposes up to 100 monitoring devises are assumed to be installed in a single year.

The OBMPU anticipates the installation of an unknown number of flow and stage measuring equipment and meteorological monitoring equipment in and near storm water drainage and recharge facilities. The installation of each device is anticipated to require one round-trip, for an estimated total of 50 round-trips. These trips are anticipated to occur within the Basin, as such the average round-trip length to install one monitoring device is anticipated to be 40 miles.

The installation of up to three extensometers will require 7 round-trips, and 7 days to complete the installation of each device. For each of the 7 days required for extensometer installation, it is anticipated that average trip length will be about 40 miles in length because these trips are anticipated to occur within the Basin. A truck mounted crane could be used to lower the cable extensometer anchor weight into the well casing.

3.5.1.4 ASR, Injection and Pumping Wells: Facilities Summaries & Operational Scenarios

Aquifer Storage and Recovery (ASR) Wells (PE2, PE4, PE5, PE7, PE8/9)
ASR wells are used to inject treated supplemental water into the Basin and to pump the injected groundwater on some periodic schedule. In order to meet the objectives of **PE2** (Exhibit 12), the OBMPU envisions constructing up to 60 ASR wells to increase supplemental water recharge capacity by up to 70,000 afy. Some of the new ASR wells that will be constructed for PE 2 can be used for **PE's 4, 7 and 8/9**; as such the total number of ASR wells anticipated to be constructed under these assumptions is 60. Specific to **PE 2,** 5 ASR wells are required to meet the objectives of **PE2** when combined with the ASR wells that meet the objectives of **PE's 4, 7 and 8/9** below. This is illustrated in Table 3.5 below. In the case that recycled water is injected into the Chino Basin, an ASR well would be replaced by one dedicated injection well plus one conventional extraction well. Some of the new ASR wells that will be constructed for PE 2 can be used for **PE's 4, 7 and 8/9**.

In order to address the objectives of **PE4** (Exhibit 14), the OBMPU envisions constructing up to 15 ASR wells in Northwest MZ-1 and Central MZ-1 to increase wet-water recharge capacity in MZ-1 by up to 25,000 afy. This will require improvements to the WFA Agua de Lejos treatment plant to increase its capacity by up to 25,000 afy and the increase in use of imported water purchased from Metropolitan Water District of Southern California by up to 25,000 afy. Some of the surface water supplied could be obtained through TVMWD from its Miramar treatment plant. As previously stated these ASR wells would also meet the objectives of **PEs 2, 5, 7 and 8/9**.

In order to address the objectives of **PE8/9** (Exhibit 27), the OBMPU envisions constructing up to 40 new ASR wells and/or 30 new conventional production wells in MZ-2/3 north of Highway 60 to increase pumping and recharge capacity by up to 70,000 afy to implement Storage and Recovery programs. The ASR wells also meet the objectives of **PEs 2, 4 and 5**.

For the purposes of this analysis, the OBMPU assumes that <u>a total of 60 ASR wells</u> would be installed to accomplish the objectives of **PEs 2, 4, 5, 7, 8/9**—which are outlined under Section 3.4, Project Characteristics above. Because conventional wells and ASR wells require the same construction techniques (discussed below under **3.5.1.5 Wells (ASR, Injection, and Pumping): Construction Scenario**), this analysis assumes that up to 60 ASR wells will be installed, though there is a potential that conventional wells developed to either increase pumping and recharge capacity (**PE 8/9**) or to install injection/extraction well pairs; regardless no more than 60 wells will be developed to serve ASR objectives related to **PEs 2, 4, 5, 7, 8/9**.

Table 3.5
ASR WELLS PER PROGRAM ELEMENT

PE (Location)	Number of Wells
PE 4 with potential use for PE 2 (MZ 1 north of Hwy 60)	15
PE 8/9 with potential use for PE 2 (MZ 2/3 north of Hwy 60)	40
Additional wells for PE 2 (north of Hwy 60)	5
TOTAL	**60**

<u>ASR Wells: Facilities Summary</u>

- The depth of a new ASR wells could range between 500 and 1,500 feet.
- The average area of disturbance of a well site is anticipated to be half an acre or less.
- The installation of the proposed ASR wells or injection/extraction well pairs includes the construction of conveyance facilities to: (1) convey the supplemental water to the ASR wells and to convey pumped groundwater to end users; and/or (2) to supply water to the ASR wells for recharge and to convey pumped groundwater to end users. Conveyance facilities include pipelines, booster stations, reservoirs and related appurtenances.
    - The length of pipelines for **PE2** is estimated to be about 150,000 LF. The location of associated booster stations, reservoirs and minor appurtenances are currently unknown.
    - The length of pipelines for **PE4** is estimated to be about 37,500 LF. The location of possible associated booster stations, reservoirs and related appurtenances are unknown.
    - The estimated length of pipelines for **PE8/9** is estimated to be about 100,000 LF. The location of associated booster station, reservoirs and related appurtenances are unknown.
- The primary physical difference between ASR and production wells is that different valve options are installed according to the type of well.
- The installation of the proposed ASR wells includes the construction of improvements to wastewater treatment plants if recycled water is injected into an ASR well (described under Wastewater Treatment Facilities below). In the case that recycled water is injected into the Chino Basin, an ASR well would be replaced by one dedicated injection well plus one conventional extraction well.
- The expected location of ASR wells is north of Highway 60 in MZ-1, MZ-2 and MZ-3.

<u>ASR Wells: Operational Scenario</u>
ASR wells under **PE2** and **PE 4** will be operated seasonally, and pumping is expected to occur during the summer at an assumed utilization rate of 80 percent, while recharge is expected for the remainder of the year at an assumed utilization rate of 70 percent. The wells will pump up to 12,500 afy at an assumed rate of 1,200 gpm. Recharge for ASR wells (or injection wells) will occur by gravity flow and will require no pumping to place the water in the aquifer. Energy consumption is expected to range between 300 and 650 kWh per af.

<u>ASR Wells and Conventional Wells Incorporated into Watermaster Storage Management Plan: Operational Scenario</u>
Based on the 2018 Storage Framework Investigation (SFI) (WEI, 2018) and the 2020 Storage Management Plan (SMP) (WEI, 2019), the Chino Basin Parties will utilize up to 720,000 af of groundwater storage for their individual conjunctive-use activities. Metropolitan Water District of

Southern California (Metropolitan) currently has a storage agreement that allows them to operate a Storage and Recovery Program (Dry-Year Yield Program or DYYP) in the Chino Basin through 2028. Collectively, the Chino Basin Parties and Metropolitan will use up to 800,000 af through 2030 and the amount of storage space used by Chino Basin Parties for their individual conjunctive-use activities is projected to gradually decline for several decades thereafter. The 2018 SFI analyzed the basin response from the Chino Basin Parties' use of storage space up to 700,000 af and the conjunctive-use by Storage and Recovery Programs from 700,000 af to 1,000,000 af (including Metropolitan's DYYP). Based on the work done in the 2018 SFI, the storage space was divided into two bands: First Managed Storage Band (FMSB) of 800,000 af for use by the Chino Basin Parties and Metropolitan and 200,000 af of storage space between 800,000 af and 1,000,000 af for use by future Storage and Recovery Programs. The 2020 SMP requires that the facilities used to conduct Storage and Recovery programs using the storage space between 800,000 af and 1,000,000 to be located in the Northern parts of MZ2 and MZ3 as shown in Exhibit 27.

The facilities required by the Chino Basin Parties and Metropolitan to conduct their conjunctive-use activities within the FMSB currently exist and they are in operation today. The facilities required to conduct Storage and Recovery Programs using the storage space between 800,000 af and 1,000,000 af consist of a combination of existing facilities (spreading basins, ASR wells and conventional wells) and new facilities. The table below summarizes the range in existing and new facilities required to implement Storage and Recovery Programs that operate in the storage band between 800,000 af and 1,000,000 af. For purposes of this EIR and consistent with the assumptions in the 2018 SFI, the operational cycle of Storage and Recovery Programs consists of four put years, three hold years and three take years.

Table 3.6
RANGE OF EXISTING AND NEW FACILITIES REQUIRED TO IMPLEMENT STORAGE AND RECOVERY PROGRAMS

	2018 SFI			OBMPU SEIR		
	Put and takes (afy)	Number of operating wells	New energy require-ment (kwh)	Put and takes (afy)	Number of operating wells	New energy require-ment (kwh)
Annual put	50,000			50,000		
Existing spreading basin capacity used	29,280		0	0		0
Existing ASR well capacity used	2,740		219,200	0		0
Total existing put capacity used	32,020		219,200	0		0
New ASR well capacity used	17,980	9	1,438,400	50,000	24	4,000,000
Annual take	66,666			66,666		
Take through existing wells	16,667		10,173,066	0		0
Take through new ASR wells	49,999	8	30,517,977	50,000	0	30,518,587
Take through new conventional wells	0	0	0	16,666	6	10,172,455
Total new wells		17			30	
Total energy requirement			42,547,843			44,691,043

For purposes of this environmental document, it is assumed that the entire put will be accomplished with new ASR wells and the take will be accomplished with a combination of new ASR and new conventional wells. Based on the 2018 SFI, the ASR wells (totaling 60 wells) were assumed to have recharge and pumping capacities of 1,800 gpm and 2,300 gpm, respectively.

- During put years the ASR wells would be utilized 70 percent of the time. The energy required to conduct recharge through ASR would occur at treatment plants where imported water is treated prior to injection. The energy required to treat imported water prior to injection is estimated to be about 80 kwh per af based on the treatment energy requirements at the Lloyd Michael and Sand Hill water treatment plant. The annual energy requirement for a put year of 50,000 afy is estimated to be 4,000,000 kwh.
- During take periods, the ASR and conventional wells would be utilized 80 percent of the time. The energy required to pump the groundwater to service pressure is estimated to be about 600 kwh per af. The annual energy requirement for a take year of 66,670 afy is estimated to be 45,000,000 kwh.

MZ 1 Well Relocation (PE4, PE8/9)

In order to address the objectives of **PE4** (Exhibit 14), the OBMPU envisions constructing up to 10 wells in MZ-2 and MZ-3 to relocate up to 25,000 afy of pumping from MZ-1 to MZ-2 and/or MZ3. The new wells could also meet the objectives of **PE 8/9**, the objectives of which are outlined under Section 3.4, Project Characteristics above.

<u>MZ-1 Well Relocation: Facilities Summary</u>

The depth of these new wells could range between 500 and 1,000 feet and the average area of disturbance of a well site is anticipated to be half an acre or less. Conveyance facilities to convey the water pumped from these new wells to MZ1 pumpers include pipelines, booster pump stations, reservoirs and related appurtenances, the capacity and locations of which are presently unknown.

<u>MZ-1 Well Relocation: Operational Scenario</u>

New conventional pumping wells in MZ-2/3 are assumed be operated 80 percent of the time for a maximum of 25,000 afy at a pumping rate of 2,300 gpm. Based on the depth to water in this area, energy consumption would be about 550 kWh per af.

Expand the Existing Chino Desalter Groundwater Pumping (PE7, PE8/9).

The OBMPU envisions expanding the existing Chino Desalter capacity by up to 6,000 afy by adding new wells. This will require constructing up to 8 wells in the existing desalter wellfield areas (shown on Exhibit 25) to increase pumping up to 6,000 afy to maintain Hydraulic Control and to mitigate reductions in net recharge and Safe Yield caused by the implementation of a future land subsidence management and Storage and Recovery Programs. The new wells also meet the objectives of **PE 8/9**, the objectives of which are outlined under Section 3.4, Project Characteristics above.

<u>Expand the Existing Chino Desalter Groundwater Pumping: Facilities Summary</u>

Well depths could range from 250 to 1,000 feet. The average area of disturbance of a well site is anticipated to be half an acre or less. Additionally, the effort to maintain Hydraulic Control in the future may require the Watermaster to acquire up to 5 existing wells in in the Chino Creek well field area that, in aggregate, can pump up to 2,000 afy to maintain Hydraulic Control. This effort is anticipated to be ministerial in nature; however, it is possible that any one of the acquired wells may require redevelopment, removal and disposal of existing pumping equipment, installation of new pumping equipment and well head improvements to enable adequate pumping. Up to 65,000 LF of conveyance would be required to connect the new wells to a treatment facility.

Expand the Existing Chino Desalter Groundwater Pumping: Operational Scenario
New conventional pumping wells in the Chino Desalter area are assumed be operated 80 percent of the time for a maximum of 6,000 afy at pumping rates of ranging from 400 to 2,300 gpm. Energy consumption is expected to range between 300 and 550 kWh per af.

Replacement and Modification to Existing Wells (PE8/9)
The OBMPU envisions constructing replacement wells and/or modification to existing wells to mitigate loss of pumping capacity caused by a future Storage and Recovery Program(s). The location of these wells has not yet been identified; however, the facilities and/or improvements to existing facilities envisioned under the OBMPU to conduct a Storage and Recovery Program within the SMP are listed below and shown on (Exhibit 27). The replacement of and modifications to existing wells would meet the objectives of **PE 8/9**, the objectives of which are outlined under Section 3.4, Project Characteristics above.

Replacement and Modification to Existing Wells: Facilities Summary
For planning purposes, it is anticipated that up to 5 existing wells may be modified, and a maximum of 5 existing wells will be abandoned, destroyed, and replaced with a new well; these replacement wells will not increase the overall number of wells anticipated to be developed as part of the OBMPU as they would ultimately serve the purposes of the Program Elements requiring the development of wells as outlined above. Modification of a well could include deepening the well by drilling, lowering the pump, removal of the existing pumping equipment and replacing it with new pumping equipment and other well head improvements. Replacing a well includes the drilling, well completion, installation of new pumping equipment, site and well head improvements and new conveyance facilities.

Replacement and Modification to Existing Wells: Operational Scenario
New or modified conventional pumping wells in the Chino Desalter area are assumed be operated (utilization rate) 80 percent of the time for a maximum of 6,000 afy at a pumping rate of ranging from 400 to 2,300 gpm. Energy consumption is expected to range between 300 and 550 kWh per af.

CONCLUSION
It is estimated that under the OBMPU a total of 178 wells will be developed to serve the various purposes outlined above, while an additional 5 existing wells will be modified, and 5 existing wells will be abandoned or destroyed. Furthermore, the ASR wells will require construction of conveyance and treatment facilities to supply water to the ASR wells for recharge and to convey pumped groundwater to end users. As such, it is estimated that under the OBMPU a total of 190,000 LF of pipeline will be required to connect wells to the distribution systems, which is inclusive of each of the three types of ASR well development projects required above.

3.5.1.5 Wells (ASR, Injection, and Pumping): Construction Scenario

The OBMPU anticipates the installation of up to 78 new wells, modification of 5 wells, and abandonment/destruction of 5 wells over a period of 30 years; these figures are inclusive of wells proposed to be developed to relocate 25,000 afy of pumping from MZ-1 to MZ-2 and/or MZ3 (10 wells), constructing new wells in the existing desalter well field areas to increase pumping by up to 6,000 afy to maintain Hydraulic Control (8 wells), 60 ASR wells proposed to be developed to increase pumping and supplemental water recharge capacity by up to about 70,000 afy and to increase wet-water recharge capacity in MZ-1 by up to 25,000 afy (note that up to 30 conventional wells could be installed in place of a commensurate number of ASR wells to meet the same objectives; construction for these two types of wells is essentially the same with the exception of a valve required to be installed for ASR wells to manage injection or extraction operations), modification to existing wells to mitigate loss of pumping capacity caused by a Storage and Recovery Program, and destruction of 5 abandoned wells, the presence of which is a threat to groundwater supply and a physical hazard. Installing 78 wells over 30 years can be evaluated based on an average number of wells per year (4 wells) or based on a possible maximum number of wells per year, which for planning purposes will be 10 wells per year. Thus, for analysis purposes it is assumed that a maximum of 10 wells per year may be developed. Development of up to 10 new wells during a given year will require the delivery and set up of the drilling rig at each site. It is anticipated these wells will be drilled at different times and the drilling equipment will be transported to and from the sites on separate occasions. For the purposes of this evaluation, it is forecast that delivery of the drilling equipment 10 times (# of wells anticipated to be drilled in a year) in a year will result in ten 50-mile round-trips for the drill rigs.

ASR well development has essentially the same construction impacts as production well development. The primary physical difference between ASR and production wells is that different valve options are installed according to the type of well.

It is assumed that the average pumping capacity for a new conventional pumping or ASR well will range from 400 to 2,300 gpm depending on the location of the well (see Section 3.6, Summary of Operational Scenarios).

It is anticipated that about five persons will be on a given well site at any one time to support drilling a well: three drillers, the hydrologist inspector, and a foreman. Daily trips to complete the well will average about 15 roundtrips per day, which at various points of construction will include: two roundtrips for drill rigs; between 6 and 12 roundtrips for cement trucks; about 5 trips to deliver pipe; and about 10 trips per day for employees.

For analysis purposes it is assumed that each well would be drilled using the direct rotary or fluid reverse circulation rotary drilling methods. The average area of disturbance of each well site is estimated to be one-half an acre or less. Access to the drilling site for the drilling rig and support vehicles would be from adjacent roadways. Typically, well drilling requires only minimal earth movement and/or grading.

The drilling and development of each well will require drilling to—in most cases—between 250 and 1,500 feet below ground surface (bgs). The proposed schedule for constructing each well would be as follows: drilling, construction, and testing of each well would require approximately six weeks to complete (about 45 days, of which 15 to 20 days would include 24-hour, 7-day a week drill activity). For planning purposes, a construction and testing schedule duration of 60 days per well is assumed to account for unforeseen circumstances (e.g. extreme weather, equipment break downs, etc.) that could affect the drilling and testing schedule. The well casings are expected to be welded and it will be assumed that well development and installation will require a two week use of a diesel generator.

The borehole for the well would be drilled using at least two separate drilling passes. The first pass, or pilot borehole, would be drilled using a 17.5-inch diameter bit to an estimated maximum depth below the ground surface, which would correspond to the top of the consolidated bedrock in the area, or a depth selected by the project hydrologist/hydrogeologist. Upon completion of the geophysical logs, the pilot borehole would be enlarged (reamed) to a diameter of 24 inches to approximately the same depth to accommodate the well casing, screen and filter pack.

Once each well is constructed it would immediately be developed through a process of swabbing and airlifting. During this process, drilling fluids and suspended sediment would be removed from the well. After the drilling fluids are removed along with most of the suspended sediment, the well would be further developed through pumping.

3.5.1.6 Well Destruction

Well Destruction (PE 1)

The objective of **PE 1** under the OBMPU includes continuing the ongoing monitoring and reporting program and developing and updating an *OBMP Monitoring and Reporting Work Plan*, which is considered part of the baseline conditions and is discussed here for completeness. A part of this objective includes destroying abandoned wells due to the threat they pose to the groundwater supply. The presence of improperly 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. Watermaster requests owners of abandoned wells to properly destroy their wells pursuant to the DWR Well Standards (Bulletins 74-81 & 74-90). Under the OBMPU, Watermaster will continue these efforts, though no specific abandoned wells have been identified to be destroyed at this time.

<u>Well Destruction: Summary of Facilities</u>

This includes sealing the upper 20 feet with an impervious sealing material (neat cement, sand-cement grout, concrete, or bentonite clay). In areas where the interchange of water between aquifers occurs, impervious material will be placed opposite the confining formations above and below the producing formations for a distance of 10 feet or more. The remainder of the well shall be filled with suitable fill (clay, silt, sand, gravel, crushed stone, native soils, or mixtures of the aforementioned types). In urban areas, additional requirements must be met. These include: 1) A hole shall be excavated around the well casing to a depth of 5 feet below the ground surface and the well casing removed to the bottom of the excavation; 2) The sealing material used for the upper portion of the well shall be allowed to spill over into the excavation to form a cap; and. 3) After the well has been properly filled, including sufficient time for sealing material in the excavation to set, the excavation shall be filled with native soil.

<u>Well Destruction: Operational Scenario</u>

Watermaster requests owners of abandoned wells to properly destroy their wells pursuant to the DWR Well Standards (Bulletins 74-81 & 74-90). This includes sealing the upper 20 feet with an impervious sealing material (neat cement, sand-cement grout, concrete, or bentonite clay). In areas where the interchange of water between aquifers occurs, impervious material will be placed opposite the confining formations above and below the producing formations for a distance of 10 feet or more. The remainder of the well shall be filled with suitable fill (clay, silt, sand, gravel, crushed stone, native soils, or mixtures of the aforementioned types). In urban areas, additional requirements must be met. These include: 1) A hole shall be excavated around the well casing to a depth of 5 feet below the ground surface and the well casing removed to the bottom of the excavation; 2) The sealing material used for the upper portion of the well shall be allowed to spill over into the excavation to form a cap; and 3) After the well has been properly filled, including sufficient time for sealing material in the excavation to set, the excavation shall be filled with native soil.

3.5.2 Project Category 2: Conveyance Facilities and Ancillary Facilities

3.5.2.1 Recycled and Potable Water Distribution/Conveyance: Summary of Facilities

Indirect Potable Reuse Conveyance Improvements (PE5, PE8/9)

The OBMPU envisions expanding the recycled water distribution system for indirect potable reuse by constructing conveyance facilities that include pipelines, booster pump stations, reservoirs and minor appurtenances. The general location of these facilities is shown in Exhibit 16. The proposed recycled water conveyance improvements also meet the objectives of **PEs 5 and 8/9**, the objectives of which are outlined under Section 3.4, Project Characteristics, above.

Indirect Potable Reuse Conveyance Improvements: Summary of Facilities

This pipeline project will require ancillary facilities that include booster pump stations, reservoirs and related appurtenances. The number, location and capacities of the proposed conveyance facility improvements are presently unknown; however, it is anticipated that the up to 50,000 LF of pipeline could be constructed underground and within existing road rights-of-ways.

East/West Regional Pipeline (PE5, PE8/9)

The OBMPU envisions constructing an east to west up to 75,000-foot regional pipeline across the northern part of the Chino Basin to enable the efficient conveyance and distribution of supplemental and basin waters to Chino Basin water users; and/or the construction of improvements to existing conveyance facilities to accomplish the same. The proposed regional pipeline also meets the objectives of **PEs 5 and 8/9**, the objectives of which are outlined under Section 3.4, Project Characteristics, above.

East/West Regional Pipeline: Summary of Facilities

This pipeline project will require ancillary facilities that include booster pump stations, reservoirs and related appurtenances. The precise locations, number and capacities of the proposed conveyance facility improvements are unknown, though the alignment envisioned under the OBMPU is shown approximately on Exhibit 17. It is anticipated that the proposed pipeline will be constructed underground and within existing road rights-of-ways.

North/South Regional Pipeline (PE5, PE8/9)

The OBMPU envisions constructing a north-to-south up to 45,000-foot regional pipeline across the eastern part of the Chino Basin to enable the efficient conveyance and distribution of supplemental and basin waters to Chino Basin water users; and or the construction of improvements to existing conveyance facilities to accomplish the same. The proposed regional pipeline also meets the objectives of **PEs 5 and 8/9**, the objectives of which are outlined under Section 3.4, Project Characteristics, above.

North/South Regional Pipeline: Summary of Facilities

This pipeline project will require ancillary facilities that include booster pump stations, reservoirs and related appurtenances. The precise locations, number and capacities of the proposed conveyance facility improvements are unknown, though the alignment envisioned under the OBMPU is shown approximately on Exhibit 17. It is anticipated that the proposed pipeline will be constructed underground and within existing road rights-of-ways.

Groundwater Treatment Conveyance (PE5, PE6, PE8/9)
The OBMPU envisions constructing conveyance facilities to convey untreated groundwater to the treatment facilities and to convey treated water from the treatment facilities to water users, of which the precise location, number and capacities of the proposed conveyance systems is presently unknown. The proposed groundwater treatment conveyance facilities would address the contaminants of concern within the Chino Basin based on the recommendations of the *Groundwater Quality Management Plan.* The construction of new groundwater treatment conveyance facilities has the potential to mitigate the effects of Storage and Recovery Program on the remediation projects, which would meet the objectives of **PE 8/9**, the objectives of which are outlined under Section 3.4, Project Characteristics above. Additionally, the construction of new groundwater treatment conveyance facilities meets the objectives of **PE 5**, the objectives of which are outlined under Section 3.4, Project Characteristics above.

<u>Groundwater Treatment Conveyance: Summary of Facilities</u>
The precise location, number and capacities of the proposed conveyance systems is presently unknown; however, it is anticipated that the pipelines will be constructed underground and within existing road rights-of-ways. It is anticipated that the treated conveyance systems would be located in proximity to the municipal wells shown Exhibit 18 that have experienced exceedances of DDW MCLs.

CONCLUSION
Approximately 170,000 LF of pipelines and associated conveyance facilities improvements are required to improve the recycled and potable water distribution systems to achieve the OBMPU goals, and to supply groundwater treatment facilities to achieve the OBMPU goals. Note that the proposed pipelines that would support Indirect Potable Reuse were previously analyzed in the 2017 IEUA FMP PEIR and are considered part of the baseline conditions, and are included herein for completeness.

As stated under **3.5.1.4 ASR, Injection and Pumping Wells: Facilities Summaries & Operational Scenarios**, it is estimated that under the OBMPU a total of 190,000 LF of pipeline will be required to connect wells to the distribution systems. Additionally, under **3.5.3.1 Storage and Recharge Facilities: Summary of Facilities and Operational Scenarios**, the conveyance facilities required to increase recharge in the Chino Basin include an estimated 275,000 LF of pipelines.

It is assumed at this time that the total pipeline installed by the OBMPU will be 600,000 LF; this assumes that a nominal amount of pipeline may serve dual purpose for the varying Program Elements of the OBMPU. Of the 600,000 LF of pipeline that would be developed in support of the OBMPU, 50,000 LF were previously analyzed in the 2017 IEUA FMP PEIR. These previously analyzed projects are considered part of the baseline conditions, however, they are summarized here for completeness. As such, the OBMPU will analyze the construction of 550,000 LF of pipeline.

3.5.2.2 Recycled and Potable Water Distribution/Conveyance: Operational Scenario

Once a pipeline is installed, operations do not require any visits unless unforeseen circumstances arise that would require maintenance or repair of the pipelines. In the event of routine maintenance one vehicle trip per maintenance event would be required. Booster pump stations that are incorporated into the project will be operated to convey the water, but the capacity and amounts of water pumped is currently unknown.

3.5.2.3 Conveyance Pipelines: Construction Scenario

An estimated 550,000 LF of pipeline may be installed in support of OBMPU through 2050. The maximum pipe length that would be installed in a single year would be 100,000 LF. It is forecast that most of the pipe will range from 10-inch to 84-inch diameter. It is assumed that an underground utility installation team can install an average of 200-400 LF of potable water pipeline, recycled water line, or storm drains per day. A team consists of the following:

200-400 feet of pipeline installed per day
1 Excavator
1 Backhoe
1 Paver
1 Roller
1 Water truck
Traffic Control Signage and Devices
10 Dump/delivery trucks (40 miles round trip distance)
Employees (14 members per team, 40-mile round-trip commute)

The emissions calculations are based upon the above assumptions for each pipeline installation team. Typically, up to 800 feet of pipeline trench could be excavated, the pipe installed, backfilled, and compacted each day during pipeline installation in undeveloped areas whereas only 400 ft per day can be installed in developed roadways. In either case equipment would be operated for roughly the same portion of the day and daily equipment emissions would be the same, except that undeveloped areas would not require pavement removal and reinstallation.

It is assumed that two teams will be installing pipelines for a maximum total of 800 LF per day (400 x 2 = 800 LF). It is assumed that the proposed pipeline installation will occur for a maximum of 260 days in one calendar year.

Ground disturbance emissions assume roughly half an acre of land would be actively excavated on a given day. It is anticipated that installation of pipeline in developed locations will require the use of a backhoe, crane, compactor, roller/vibrator, pavement cutter, grinder, haul truck and two dump trucks operating 6 hours per day; a water truck and excavator operating 4 hours per day and a paving machine and compacter operating 2 hours per day. Installation of pipeline in undeveloped locations would require the same equipment without the paving equipment (cutter, grinder, paving machine).

The pipelines that would be installed in support of OBMPU are anticipated to use push-on joints (e.g., gasketed bell-and-spigot) that do not require welding. However, the Contractor may occasionally use a portable generator and welder for equipment repairs or incidental uses.

3.5.2.4 Booster Stations: Construction Scenario

Booster stations are required to pump water from areas at a lower elevation within the Basin, to areas located at a higher elevation. The total number of booster stations to be constructed in support of the OBMPU is unknown. It is forecasted that, at each site, no more than 0.5 acre will be actively graded on a given day for site preparation of each booster station. It is anticipated that grading activities will occur over a 5-day period and will require one bull dozer or motor grader operating 8 hours per day, one water truck operating 4 hours per day and one dump truck operating 4 hours per day. Calculations assume five workers will each commute 40 miles round-trip to each work site.

Construction of each pump station will require the delivery and installation of equipment and materials. This phase of construction will result in 6 truck trips on the worst-case day with an average round trip of 20 miles delivering construction materials and equipment (concrete, steel, pipe, etc.). Installation of the booster station will require the use a crane, forklift, backhoe and front loader operating 4 hours per day. Calculations assume five workers will each commute 40 miles round-trip to the work site.
Each booster pump station is assumed to be housed within a block building, and will require a transformer to be installed to handle the electric power delivered to the pumps. The proposed booster pump station building may include a pump room, electric control room, odor control facilities, chemical tanks, and storage room. Construction of the booster pump station would involve installation of piping and electrical equipment, excavation and structural foundation installation, pump house construction, pump and motor installation, and final site completion.

The pump stations proposed are anticipated to be located at sites that have permanent power available for construction, as such a generator is not anticipated to be required for welding required to construct the booster pump stations.

3.5.2.5 Surplus and Supplemental Water Supply Acquisition: Summary of Facilities

Imported Recycled Water Facilities (PE5, PE8/9)
The OBMPU envisions acquiring surplus recycled water supplies from non-IEUA sources and constructing conveyance facilities to import the recycled water. The proposed acquisition and importation of surplus recycled water supplies meets the objectives of **PEs 5 and 8/9**, the objectives of which are outlined under Section 3.4, Project Characteristics above. The facilities and/or improvements to existing facilities to improve water reliability envisioned under the OBMPU are listed below and shown on Exhibit 17.

<u>Imported Recycled Water Facilities: Summary of Facilities</u>
These conveyance facilities include pipelines, booster pump stations, reservoirs and minor appurtenances whose locations, lengths, and capacities are presently unknown. However, it is anticipated that the pipelines will be located below ground and within existing road rights-of-ways.

Constructing Conveyance Facilities to Enable the Distribution of Future Imported Surface Water and Groundwater from Nearby Streams and Groundwater Basins (PE5)
Installation of these conveyance facilities would meet the objectives of **PE5** by maximizing recycled water reuse and establishing or expanding future recycled water planning efforts to maximize the reuse of all available sources of recycled water. This may require new conveyance facilities including pipelines, booster pump stations, reservoirs and related appurtenances whose number, locations and capacities are presently unknown. It is anticipated that the pipelines will be constructed underground and within existing road rights-of-ways.

CONCLUSION
The conveyance facilities required to import non-IEUA recycled water include pipelines, booster pump stations, reservoirs and related appurtenances whose number, locations, and capacities to achieve the OBMPU goals are presently unknown.

3.5.2.6 Surplus and Supplemental Water Supply Acquisition: Operational Scenario

Once the pipeline is installed to enable future conveyance of recycled water, imported surface water and groundwater from nearby streams and groundwater basins, to the Chino Basin, operations do not require any visits unless unforeseen circumstances arise that would require maintenance or repair of the pipelines. In the event of routine maintenance one vehicle trip per maintenance event would be required. Booster pump stations that are incorporated into the project will be operated to convey the water, but the capacity and amounts of water pumped is currently unknown.

3.5.2.7 Conveyance Pipelines: Construction Scenario

Please refer to the discussion under Section 3.5.2.3 Conveyance Pipelines: Construction Scenario, above.

3.5.3 Project Category 3: Storage Basins, Recharge Facilities and Storage Bands

3.5.3.1 Storage and Recharge Facilities: Summary of Facilities and Operational Scenarios

The RMPU was developed in open and transparent planning processes that were convened by Watermaster through an ad-hoc committee; note that, as stated under **3.4.3.2 Program Element 2. Develop and Implement Comprehensive Recharge Program**, one of the findings of the 2018 RMPU was that Watermaster had enough supplemental water recharge capacity to meet its Replenishment Obligations via wet-water recharge through 2050. The new storage/recharge facilities and/or improvements to existing facilities that may result from the Recharge Master Plan Update (RMPU) process as envisioned under the OBMPU are listed below and shown on Exhibit 12. Note that the RMPU process and facility modifications have been evaluated in detail.

The proposed storage facilities would divert surface water to be stored at the proposed facilities. The amount of surface water diverted by the proposed storage and recharge facilities is not presently known, and it would be speculative to estimate at this time. Future surface water diversions to these facilities would depend on future applications to divert surface water to a specific proposed facility, and would require a second tier CEQA evaluation.

New Storage Basin: California Institution for Men (PE2, PE4, PE5, PE8/9)
The OBMPU envisions constructing and operating a new storage basin for stormwater and supplemental waters at the California Institution for Men (CIM). The location of the CIM is depicted on Exhibit 12. The new recharge resulting from this new storage basin meets the objectives of **PEs 2, 4, 5, and 8/9**, the objectives of which are outlined under Section 3.4, Project Characteristics above.

New Storage Basin, California Institution for Men: Summary of Facilities
The OBMPU envisions the following facilities at the CIM: a diversion structure that would divert stormwater and dry-weather discharge from Chino Creek to the new storage basin; booster pump stations, pipelines and basins that would convey stormwater and dry-weather discharge from the new storage basin to recharge facilities in the northern part of the Basin; and, pipelines to convey supplemental waters to the storage basin for seasonal storage. The new storage basin at the CIM could have an estimated area between 50 and 100 acres, although its capacity and the amount of surface water diverted to it is unknown at this time. The proposed new storage basin will require

conveyance facilities that include up to 60,000 LF of pipelines and presently an unknown number, locations and capacities of booster pump stations, basins and related appurtenances.

<u>New Storage Basin, California Institution for Men: Operational Scenario</u>
Operations at this storage reservoir consists of diversion and capture of stormwater and dry-weather discharges, pumping the stored water to recharge basins upstream of these storage reservoirs and maintenance of storage and conveyance facilities. The energy required to pump stored water to recharge facilities or for other uses is presently unknown. Basin maintenance is expected to occur every two to three years for each storage basin, consisting of removal of debris and trash that is diverted with the stormwater and dry-weather discharges, removal of vegetation and vector management. Other operations may include diversion, storage and recharge of imported water and pumping of recycled water from wastewater treatment plants owned by IEUA to these storage reservoirs.

New Storage Basin: Lower Cucamonga Ponds (PE2, PE5, PE8/9)
The OBMPU envisions constructing and operating a new storage basin at the existing Lower Cucamonga Ponds, which will meet the objective of **PE2** through the implementation of recharge projects based on need and available resources. The location of the Lower Cucamonga Ponds is depicted on Exhibit 12. The new recharge resulting from this new storage basin will meet the objectives of **PEs 5 and 8/9**, the objectives of which are outlined under Section 3.4, Project Characteristics above.

<u>New Storage Basin, Lower Cucamonga Ponds: Summary of Facilities</u>
The Lower Cucamonga Ponds are existing detention basins owned by the San Bernardino County Flood Control District. The ponds would be converted into one storage basin to store stormwater and dry-weather discharges, and will encompass an area of about 50 acres, although its capacity and the amount of surface water diverted to it is unknown at this time. The new storage basin at the Lower Cucamonga Ponds may include the following facilities: construction of dam and reservoir over the current footprint of the Lower Cucamonga ponds and adjacent Cucamonga Creek Channel; and booster pump stations, pipelines and reservoirs to convey stormwater and dry-weather discharges from the new storage basin to recharge facilities in the northern part of the basin. The proposed new storage basin will require conveyance facilities that include an estimated 90,000 LF of new pipeline and presently unknown number, locations and capacities of booster pump stations, reservoirs and related appurtenances.

<u>New Storage Basin, Lower Cucamonga Ponds: Operational Scenario</u>
Refer to the Operational Scenario under ***New Storage Basin: California Institution for Men*** above.

New Storage Basin: Mills Wetlands (PE2, PE5, PE8/9)
The OBMPU envisions constructing and operating a new storage basin at the existing Mills Wetlands. The location of the Mills Wetlands is depicted on Exhibit 12. The new recharge resulting from this new storage basin will meet the objectives of **PEs 5 and 8/9**, the objectives of which are outlined under Section 3.4, Project Characteristics above.

<u>New Storage Basin, Mills Wetlands: Summary of Facilities</u>
The Mills Wetlands are existing artificial wetlands used to treat Cucamonga Creek discharge with an area of about 30 acres. The wetlands would be converted into a storage basin to store stormwater and dry-weather discharges, although its capacity and the amount of surface water diverted to it is unknown at this time. The new storage basin at the Mills Wetlands may include

the following components: expansion of the storage capacity of the existing Mills wetland by excavation of the bottom and other grading improvements to expand storage capacity; improvements to existing diversion facilities and or the construction of new diversion structures to divert stormwater and dry-weather discharge from Cucamonga Creek to the new storage basin; and, booster pump stations, pipelines and storage basins to convey stormwater and dry-weather discharges from the new basin to recharge facilities in the northern part of the basin. The proposed new storage basin will require conveyance facilities that include an estimated 30,000 LF of new pipelines and presently unknown number, locations and capacities of booster pump stations, reservoirs and related appurtenances.

New Storage Basin, Mills Wetlands: Operational Scenario
Refer to the Operational Scenario under ***New Storage Basin: California Institution for Men*** above.

New Storage Basin: Vulcan Basin (PE2, PE5, PE8/9)
The OBMPU envisions constructing and operating a new storage basin for stormwater and supplemental waters at the existing Vulcan Basin. The location of the Vulcan Basin is depicted on Exhibit 12. The new recharge resulting from this new storage basin will meet the objectives of **PEs 5 and 8/9**, the objectives of which are outlined under Section 3.4, Project Characteristics above.

New Storage Basin, Vulcan Basin: Summary of Facilities
The Vulcan Basin is an existing facility formerly used as a sand and gravel mine. It has an area of about 60 acres. The new storage basin at the Vulcan Basin may include the following components: facilities to divert stormwater and dry-weather flow from the West Fontana Channel and surrounding urban areas to the new storage basin; booster pump stations, pipelines, reservoirs and minor appurtenances to convey supplemental water to the Basin; grading improvements within the Basin to expand the storage capacity and to regulate stored water; booster pump stations, pipelines, reservoirs and minor appurtenances to convey stored water to recharge facilities in the northern part of the basin, the RP3 recharge facilities and to IEUA recycled water system for reuse. The proposed new storage basin may require conveyance facilities that include an estimated 20,000 LF of pipelines and presently unknown number, locations and capacities of booster pump stations, reservoirs and related appurtenances, although its capacity and the amount of surface water diverted to it is unknown at this time.

New Storage Basin, Vulcan Basin: Operational Scenario
Refer to the Operational Scenario under ***New Storage Basin: California Institution for Men*** above.

New Storage Basin: Confluence Project (PE2, PE5, PE8/9)
The OBMPU envisions that the Chino Basin Water Conservation District may construct and operate a new storage basin at the confluence of San Antonio and Chino Creeks (proposed Confluence Project). The new recharge resulting from this Confluence Project meets the objectives of **PEs 2, 5 and 8/9**, the objectives of which are outlined under Section 3.4, Project Characteristics above.

New Storage Basin, Confluence Project: Summary of Facilities
The Confluence Project is anticipated to have an area of about 10 acres and a depth of about 35 feet, which would result in about 200,000 cubic yards of material removal, with the goal of balancing the cut and fill to minimize material export, although its capacity and the amount of

surface water diverted to it is unknown at this time. The Confluence Project may include the following components: two diversion structures with rubber dams and pumps to divert stormwater and dry-weather flow from of San Antonio and Chino Creeks to the new storage basin; and booster pump stations, pipelines, reservoirs and minor appurtenances to convey stormwater and dry-weather discharges from the new storage basin to the Montclair spreading basins in the northern part of the basin. The proposed Confluence Project will require conveyance facilities that include an estimated 35,000 LF of pipelines and presently unknown number and locations of booster pump stations, reservoirs and related appurtenances.

<u>New Storage Basin, Confluence Project: Operational Scenario</u>
Refer to the Operational Scenario under ***New Storage Basin: California Institution for Men*** above.

Modifications to an Existing Basin: Riverside Basin (PE2, PE5, PE8/9)
The OBMPU envisions constructing and operating a new storage basin at the existing Riverside Basin. The location of the Riverside Basin is depicted on Exhibit 12. The new recharge resulting from this new storage basin will meet the objectives of **PEs 5 and 8/9**, the objectives of which are outlined under Section 3.4, Project Characteristics above.

<u>Modifications to an Existing Basin, Riverside Basin: Summary of Facilities</u>
The Riverside Basin is an existing detention basin owned by the San Bernardino County Flood Control District. The basin would be converted into a multipurpose facility that would maintain its flood control function and temporarily store stormwater and dry-weather discharges, although its capacity and the amount of surface water diverted to it is unknown at this time. It has an area of about 60 acres. The new storage basin at the Riverside Basin includes the following components: expansion of the storage capacity of the existing Riverside Basin by excavation of the bottom and other grading improvements to expand storage capacity and create conservation storage; and booster pump stations, pipelines and storage basins to convey stormwater and dry-weather discharges from the new storage basin to recharge facilities in the northern part of the basin. The proposed new storage basin will require conveyance facilities that include an estimated 5,000 LF of pipelines and presently unknown number, locations and capacities of booster pump stations, reservoirs and related appurtenances.

<u>Modifications to an Existing Basin, Riverside Basin: Operational Scenario</u>
Refer to the Operational Scenario under ***New Storage Basin: California Institution for Men*** above.

Modifications to an Existing Basin: Jurupa Basin (PE2, PE5, PE8/9)
The OBMPU envisions constructing improvements at the Jurupa Basin. The location of the Jurupa Basin is depicted on Exhibit 12. The new recharge resulting from this new storage basin will meet the objectives of **PEs 2, 5 and 8/9**, the objectives of which are outlined under Section 3.4, Project Characteristics above.

<u>Modifications to an Existing Basin, Jurupa Basin: Summary of Facilities</u>
The modifications to Jurupa Basin includes demolition of existing internal berms, constructing new internal berms, grading improvements to improve internal hydraulics within the basin, removing fine-grained materials from the Jurupa Basin floor to improve its infiltration rate and increase recharge capacity, and improvements at the Jurupa pump station intake that include the construction of trash racks or their functional equivalent and access to remove trash and debris from the pump intake structure.

Modifications to an Existing Basin, Jurupa Basin: Operational Scenario
This Jurupa Basin improvements in this project will change the operation of the basin from a temporary storage basin to a temporary storage and recharge reservoir, although its capacity and the amount of surface water to be diverted and recharged is unknown at this time. This would result in increased diversions from San Sevaine Creek, increased pumping to the RP3 recharge basin and increased recharge in the Jurupa Basin. Basin maintenance is expected to occur every two to three years, consisting of grading activities to remove fine-grained sediments, repair berms and hydraulic structures, removal of debris and trash that's diverted with the stormwater and dry-weather discharges, removal of vegetation and vector management.

Flood Managed Aquifer Recharge (PE2, PE5, PE8/9)
The OBMPU envisions constructing flood managed aquifer recharge (MAR) facilities in the northeast part of basin to recharge supplemental water. This assumes that land in existing agricultural uses can be flooded to achieve managed aquifer recharge. The potential cumulative area of these facilities is about 200 acres, which represents the total agricultural land use area in the northern part of the Chino Basin. The precise location of the proposed new flood MAR facilities is unknown at this time, beyond that they would be located within northern portion of the Chino Basin as shown on Exhibit 12, and its capacity and the amount of surface water diverted to it is unknown at this time. The new recharge resulting from this new storage basin will meet the objectives of **PEs 2, 5, and 8/9**, the objectives of which are outlined under Section 3.4, Project Characteristics above.

Flood Managed Aquifer Recharge: Summary of Facilities
Facilities to implement this include diversion structures and conveyance facilities that would convey surface water to the available agricultural land. Conveyance facilities include pipelines, booster stations, basins and related appurtenances. The proposed new MAR facilities would require conveyance facilities that include an estimated 35,000 LF of new pipelines and presently unknown number, locations and capacities of booster pump stations, basins and related appurtenances.

Flood Managed Aquifer Recharge: Operational Scenario
Operations at these facilities consist of diversion and capture of supplemental water to flood existing agricultural land. Facility maintenance is expected to occur every two to three years, consisting of minor grading activities to remove fine-grained sediments, repair berms and hydraulic structures and removal of nuisance vegetation, debris and trash.

MS4 Compliant Projects (PE2, PE4, PE8/9)
The OBMPU envisions collaborating with the MS4 permittees (typically cities and counties) to ensure MS4-compliance projects prioritize recharge. This will result in the construction of new MS4-compliance facilities that increase recharge in the Chino Basin. The Watermaster does not directly develop any MS4-compliance projects; these projects will occur as development within the overall Chino Basin area occurs. The MS4 compliance initiative meets the objectives of **PEs 2, 4 and 8/9**, the objectives of which are outlined under Section 3.4, Project Characteristics above.

MS4 Compliant Projects: Operational Scenario
Operations of these MS4 compliant projects consists of diversion and capture of on-site stormwater and dry-weather discharges for treatment and recharge, although the location and volume of such diversion and recharge projects is unknown at this time. Maintenance is expected to occur annually and will include activities specific to each facility type and could include: removal of debris and trash and replacement of components (e.g., filters).

CONCLUSION

The conveyance facilities required to increase recharge in the Chino Basin include an estimated 275,000 LF of pipelines and presently unknown booster pump stations, reservoirs and minor appurtenances whose locations and capacities to achieve the OBMPU goals are presently unknown.

3.5.3.2 Storage Reservoirs: Construction Scenario

The OBMPU proposes to develop 4 new storage reservoirs (CIM, Mills Wetlands, Vulcan Basin, and the Confluence Project), and install modifications to 3 existing reservoir/basins (Riverside Basin, Lower Cucamonga Ponds, and Jurupa Basin).

With respect to new storage reservoirs, it is forecast that for site preparation of a basin and access road, no more than 2 acres will be actively graded on a given day, while the OBMPU envisions constructing an area of up to 260 to 310 acres of new storage reservoirs. Each new basin is anticipated to be excavated to depths ranging from 20 to 100 feet. Given the area required to install the 3 new storage reservoirs, it is anticipated that the time required for the construction of these 3 new storage reservoirs is about 6-18 months per basin or a total of 18 months to 4.5 years to construct all reservoirs.

It is anticipated that grading activities will occur over an average of up to 90 to 120-day period and will require two bull dozers, two front end loaders, two water trucks, several scrapers, two excavators and four dump/haul trucks operating 6-8 hours per day. Calculations assume 20 workers will each commute 40 miles round-trip to each of the three storage basin sites. It is anticipated that no more than two reservoirs would be constructed per year.

Construction of each storage basin—including the construction of modified basins—will require the delivery and installation of equipment and materials. It is not known whether each site will balance as the basins will require excavation to reach the desired depth. However, it is anticipated that no more than 2 million cubic yards (cy) of materials total would be hauled off site by 15 cy trucks. No more than 100 round trips per day at 30 miles round-trip would be required to accomplish the effort to remove excess materials off-site. This would occur over the 30 year horizon with some periods of no hauling activities, and other periods that would reach 100 round trips per day. An estimated total of 110 round trips per day (trucks and employees) would be required to haul excess materials to a soil receiving facility. Additionally, given that it is known that contaminated soils may exist at one or more of the proposed storage basin sites, any contaminated soils will need to be properly characterized by identifying the contaminant discovered, and, based on the contaminants discovered, the soils will either be treated, blended, or directly disposed of at an appropriate facility.

It is assumed that at least two of the storage reservoirs described herein will require lining to prevent high groundwater issues in perched aquifers. The lining will consist of filling the basin floor with bentonite and soil, and compacting the top soil by rolling or tamping.

In addition to the above construction equipment, heavy duty trucks will be employed for on-site deliveries. Smaller trucks and automobiles will be utilized for on-site supervision and employee commuting. The diesel delivery trucks are assumed to require 300 on-road miles per day for a total of 30 days.

It is anticipated that the modifications proposed at the Lower Cucamonga Ponds, Riverside Basin, and Jurupa Basin, it is anticipated that each facility will require 60 days to complete grading activities, and will require one bull dozer, a front-end loader, water truck, grader, excavator and two dump/haul trucks operating 8 hours per day. Completion of the modifications to these basins is anticipated to require a total of 6 months to a year to complete per facility. As with the above outline for construction of new storage reservoirs, it is anticipated that the proposed basin modification will require the delivery and installation of equipment and materials. This phase of construction will result in 6 truck trips on the worst-case day with an average round trip of 40 miles delivering construction materials and equipment (concrete, steel, pipe, etc.). Calculations assume six workers will each commute 40 miles round-trip to the work site. In addition to the above construction equipment, heavy duty trucks will be employed for on-site deliveries. Smaller trucks and automobiles will be utilized for on-site supervision and employee commuting. The diesel delivery trucks are assumed to require 300 on-road miles per day for a total of 10 days. Any additional excavation required would fall under the construction scenario discussed in the paragraphs above, and would fall within the anticipated that 2 million cy of materials total that would be hauled off the 7 storage reservoir sites.

Flood Managed Aquifer Recharge Facilities

In addition to the proposed storage reservoirs, the OBMPU proposes up to 200 acres of Flood Managed Aquifer Recharge (MAR) facilities within existing agricultural use areas. MAR facility construction consists of grading existing agricultural lands to be able to hold and recharge surface water. The precise locations of the proposed new flood MAR facilities are unknown at this time, beyond that they will be located within northern portion of the Chino Basin as shown on Exhibit 12. As such, impacts related to the construction of these facilities have not been fully defined beyond that Flood MAR facilities are assumed to be a fraction of the impacts of the storage reservoirs.

3.5.3.3 Storage Bands: Summary

The OBMPU proposes the expansion of the safe storage capacity from 600,000 af (through June 30, 2021) to between 700,000 af and 1,000,000 af going forward. Generally, this expansion would not result in any visible above ground impacts; however, in order to ensure safe storage capacity within the Chino Basin, the facilities outlined herein (as part of 3.5 Summary of All Facilities) are intended to support this expansion.

3.5.4 Project Category 4: Desalters and Water Treatment Facilities

3.5.4.1 Water Treatment Plants: Summary of Facilities, Operational Scenarios, and Construction Scenarios

Please note that IEUA's 2017 FMP PEIR included extensive evaluations of future modifications to its four Water Reclamation Plants (WRPs: RP-1, RP-4, RP-5, and CCWRF). These previously analyzed projects are considered part of the baseline conditions, however, they are summarized here for completeness. The findings of this three-year old PEIR will be extensively referenced in this document.

Modifications to an Existing Imported Water Treatment Facility: Water Facilities Authority Agua de Lejos Treatment Plant (PE2, PE4, PE5, PE8/9).

In order to meet the objectives of **PE2** (Exhibit 12) and **PE4** (Exhibit 14), the OBMPU envisions constructing improvements to the Water Facilities Authority (WFA) Agua de Lejos Treatment

Plant. The WFA modifications also meet the objectives of **PEs 5 and 8/9**, the objectives of which are outlined under Section 3.4, Project Characteristics above.

Modifications to an Existing Imported Water Treatment Facilities, Water Facilities Authority Agua de Lejos Treatment Plant: Summary of Facilities
These modifications include the removal of some or all its solids handling limitations, and envisions other improvements to increase its capacity, thereby increasing in-lieu recharge capacity. Additionally, the OBMPU envisions constructing improvements to the WFA Agua de Lejos Treatment Plant to increase its capacity by up to 25,000 afy and also envisions an increase in the use of imported water purchased from Metropolitan Water District of Southern California by up to 25,000 afy. The specific improvements needed to increase the capacity of the plan are currently unknown, though some of the surface water supplied could be obtained through Three Valleys Municipal Water District (TVMWD) and its Miramar Treatment Plant.

Modifications to an Existing Imported Water Treatment Facilities, Water Facilities Authority Agua de Lejos Treatment Plant: Operational Scenario
This project consists of expanding the existing solids handling capacity at the Water Facilities Authority Agua de Lejos Treatment Plant from 20 mgd in wintertime and 40 mgd in summertime, to a constant capacity of 81 mgd. This will result in constantly operating the plant at two to four times its current capacity. The energy consumption anticipated to result from increasing operations at the Facility is not known at this time, though the overall program operational impacts are discussed under Chapter 4.5, Energy.

Modifications to an Existing Imported Water Treatment Facilities, Water Facilities Authority Agua de Lejos Treatment Plant: Construction Scenario
The OBMPU envisions constructing improvements to the Water Facilities Authority (WFA) Agua de Lejos Treatment Plant to remove some or all its solids handling limitations, and envisions other improvements to increase its capacity to its original design capacity, thereby increasing in-lieu recharge capacity. The specific improvements needed to increase the capacity of the plan are currently unknown.

Upgrade Existing Recycled Water Treatment Plant(s) (PE7)
The OBMPU envisions constructing new treatment trains at one or more IEUA recycled water treatment plants (RP-1, RP-4, RP-5, CCWRF) to reduce the TDS concentration of recycled water to levels that ensure compliance with IEUA and Watermaster's recycled water permits, which would meet the objectives of **PE7** by enabling the Watermaster to maintain Hydraulic Control. The facilities and/or improvements that may need to be implemented are listed below and shown on Exhibit 25.

Upgrade Existing Recycled Water Treatment Plant(s): Summary of Facilities
The area disturbed during construction of the new treatment train capacity expansion would be limited to the disturbed areas at IEUA's existing recycled water treatment plants, as described in IEUA's 2017 FMP PEIR.

Upgrade Existing Recycled Water Treatment Plant(s): Operational Scenario
Upgrades to the existing recycled water treatment plants will result in the operation of new treatment trains at one or more IEUA recycled water treatment plants. (See IEUA's 2017 FMP PEIR.)

Upgrade Existing Recycled Water Treatment Plant(s): Construction Scenario

The construction of a new treatment train (i.e. advanced water treatment to minimize TDS concentration in the recycled water generated at IEUA's Treatment Plants) may occur at one or more of IEUA's Recycled Water Reclamation Plants (WRP). As analyzed in IEUA's 2017 FMP, it is assumed that advanced recycled water treatment would be developed at one or more of IEUA's existing Treatment Plants, and that no more than one water treatment facility would be constructed per year.

3.5.4.2 Desalters and Advanced Water Treatment Facilities

Modifications to the Chino Desalters (PE4, PE7, PE8/9)

In order to achieve the objectives of **PE4** and **PE7**, the OBMPU envisions expanding the existing Chino Desalter capacity by between 2,000 afy (to achieve **PE4**'s goals alone) and 6,000 afy (to achieve both **PE4**'s and **PE7**'s goals) by adding new wells and either expanding the Chino-I and/or Chino-II treatment capacity or constructing a new treatment facility and product conveyance facilities. The location of the Chino Desalters is shown on Exhibit 14. The facilities that would enable the Watermaster to maintain Hydraulic Control as envisioned under the OBMPU are shown on Exhibit 25. The expansion of the Chino Desalters or construction of new functionally equivalent facilities could be used to mitigate the loss of net recharge and Safe Yield caused by a Storage and Recovery Program, which would meet the objectives of **PE 8/9**, the objectives of which are outlined under Section 3.4, Project Characteristics, above.

Modifications to the Chino Desalters: Summary of Facilities

The new wells required to expand the Chino Desalters are discussed under Section 3.5.1.2 ASR, Injection and Pumping Wells, above. The area disturbed during construction of the treatment plant capacity expansion—either through expansion of existing facilities or construction of a new facility—would be limited to the disturbed areas at the existing Chino Desalter treatment plant sites. Conveyance facilities will be required to convey the treatment plant product water to its end potable use. These conveyance facilities include pipelines, booster pump stations, reservoirs and minor appurtenances whose number, locations and capacities are presently unknown.

Modifications to the Chino Desalters: Operational Scenario

Desalter groundwater well production would increase by 2,000 to 6,000 afy. This would result in upgrades to the existing Chino Desalters to increase their combined capacities by up to 6 mgd or operation of up to a new 6 mgd desalter facility. Upgrades to the existing Chino Desalters or a new desalter facility will result in the operation of an additional 6 mgd of treatment through RO and pumping the additional product water into the distribution systems. The RO process would result in brine that would be disposed of through existing, expanded, or new brine management facilities as discussed under ***Brine Management Facilities (PE7)****, below.* The energy consumption anticipated to result from increasing operations at the Chino Desalters is not known at this time, though the overall program operational impacts are discussed under Chapter 4.5, Energy.

New Advanced Water Treatment Plant (PE5, PE7)

The OBMPU envisions constructing an advanced water treatment plant, which would maximize recycled water reuse (shown on Exhibit 16). The new advanced treatment plant meets the objectives of **PEs 5 and 7**, the objectives of which are outlined under Section 3.4, Project Characteristics above. This facility was previously evaluated in the 2017 FMP PEIR and data will be brought forward into this document.

<u>New Advanced Water Treatment Plant: Summary of Facilities</u>
Advanced water treatment refers to the following wastewater treatment processes: RO, membrane filtration, or functionally equivalent processes, and potentially ultraviolet (UV) disinfection. The area expected to be disturbed by the construction and operation of the plant is 10 acres. The location of this treatment plant is currently unknown; however, it could be collocated at an existing IEUA treatment plant.

The water produced by the new treatment plant could be used for direct potable reuse (DPR) and or indirect potable reuse (IPR). In either case, conveyance facilities will be required to convey the treatment plant product water to either use. These conveyance facilities include pipelines, booster pump stations, reservoirs and minor appurtenances whose number, locations and capacities are presently unknown. However, it is anticipated that the pipelines will be located below ground and within existing road rights-of-ways.

<u>New Advanced Water Treatment Plant: Operational Scenario</u>
Operations consist of running and maintaining the treatment plant. Operations will consist of treating up to 20 mgd of water through RO and microfiltration or functionally equivalent processes, and potentially ultraviolet (UV) disinfection. The plant will run 90 percent of the time. The energy requirements and chemicals required to operate the plants are presently unknown. Waste generation is presently unknown.

Brine Management Facilities (PE7)
The OBMPU envisions constructing brine management facilities for the expanded desalting described above that result in no net increase in brine disposal, which would meet the objectives of **PE7** by enabling the Watermaster to maintain Hydraulic Control. The specific brine management facilities are currently unknown.

<u>Brine Management Facilities: Operational Scenario</u>
The OBMPU envisions constructing brine management facilities that result in no net increase in brine disposal. The specific brine management facilities are currently unknown.

3.5.4.3 Desalters and Advanced Water Treatment Facilities: Construction Scenario

The OBMPU envisions expanding the existing Chino Desalter capacity by a total of up to 6,000 afy. The area disturbed during construction of the treatment plant capacity expansion would be limited to the disturbed areas at the two existing Chino Desalter treatment plant sites. As such, desalter expansion is proposed occur within an existing facility and would not require grading or site preparation. Installation of the expansion equipment would require a maximum of 15 workers and typical construction site equipment (cranes for setting ion exchange vessels, front end loaders, fork lifts, etc.) Impact estimates will assume 1 vehicle round-trip per worker and 10 deliveries per day resulting in about 25 round-trips per day over a construction period of 12 months. The average daily round-trip is anticipated to be 40-miles.

Conversely, the OBMPU envisions constructing a new advanced water treatment plant. The area expected to be disturbed by the construction and operation of the plant is 10 acres. It is anticipated that a new advanced treatment plant would be designed to treat up to 20 mgd of water. The construction of the 20 mgd advanced water treatment facility would consist of site clearing, grading, construction of facilities, installation of equipment, and site completion. Construction equipment would include the following: one bull dozer or motor grader, backhoes, loaders, dump trucks, crew trucks, concrete trucks, cranes, personal vehicles, compactor, delivery trucks, and a water truck. It is anticipated that the maximum number of construction personnel at a site on any given day will be 15 persons. The maximum number of truck deliveries is forecasted at 10 per day at 40-miles round-trip per day of construction. Materials and equipment would be delivered to the site including piping, building materials, concrete forms, roofing materials, HVAC equipment, pumps, diffusers, screens, belt presses, and screw presses. The advanced water treatment facility would require about 18 months to construct.

Brine Management Facilities

The OBMPU envisions constructing brine management facilities that result in no net increase in brine disposal. The specific brine management facilities are currently unknown.

3.5.4.4 Groundwater Treatment Facilities: Summary of Facilities, Operational Scenarios, and Construction Scenarios

Groundwater Treatment at Well Sites (PE5, PE6, PE8/9)

The OBMPU envisions constructing water treatment facilities at well sites or at sites near to wells to treat groundwater to meet drinking water standards for local use; this would meet the objectives of **PE6** because groundwater treatment facilities would address the contaminants of concern within the Chino Basin based on the recommendations of the *Groundwater Quality Management Plan*. The construction of water treatment facilities at well sites or at sites near to wells to treat groundwater has the potential to mitigate the effects of Storage and Recovery Programs on the remediation projects, which would meet the objectives of **PE 8/9**, the objectives of which are outlined under Section 3.4, Project Characteristics above. Additionally, the construction of groundwater treatment facilities meets the objectives of **PE 5**, the objectives of which are outlined under Section 3.4, Project Characteristics above.

<u>Groundwater Treatment at Well Sites: Summary of Facilities</u>

The area expected to be disturbed by the construction and operation of the treatment facilities would be limited to existing well sites if the plant is located at an existing well site; and will range from about 0.5 acres to 2 acres per facility for new treatment facilities located near a well site. New pipelines, booster pumps, reservoirs and related appurtenances will be required to convey groundwater to each treatment plant that is not collocated with a well. The precise number, locations and capacities of the proposed new water treatment plants, pipelines, booster pumps, reservoirs and related appurtenances are presently unknown. However, it is anticipated that for off-wellsite treatment plants, the pipelines will be constructed underground and within existing road rights-of-ways. The length of pipelines to convey groundwater to an off-wellsite treatment plant is expected to range between 2,500 to 10,000 LF, connecting one to four wells to the treatment plant. It is assumed that the groundwater treatment facilities would be located at or near wells shown in on Exhibit 18 where the water quality in water produced at those wells currently exceed drinking water MCLs.

<u>Groundwater Treatment at Well Sites: Operational Scenario</u>

Operations consist of running and maintaining the treatment plant. The treatment plants are assumed to operate 50 to 90 percent of the time. The energy requirements and chemicals required to operate these plants are presently unknown. Waste generation is presently unknown.

<u>Groundwater Treatment at Well Sites: Construction Scenario</u>

The OBMPU envisions constructing water treatment facilities at well sites or at sites near to wells to treat groundwater to meet drinking water standards for local use. The area expected to be disturbed by the construction and operation of the proposed treatment facilities would be limited to existing well sites; and will range from about 0.5 acres to 2 acres per facility for new treatment facilities located near a well site. Construction of water treatment facilities may involve site demolition; site paving; site prep/grading; excavation and installation of yard pipes; installation of treatment facilities; site finishing (landscaping, misc. curb/cutter, etc.); site drainage (above and below grade). Construction equipment would include the following: one bull dozer or motor grader, backhoes, loaders, dump trucks, crew trucks, concrete trucks, cranes, personal vehicles, compactor, delivery trucks, and a water truck. It is anticipated that the maximum number of construction personnel at a site on any given day will be 5 persons. The maximum number of truck deliveries is forecasted at 5 per day at 40-miles round-trip per day of construction. Each water treatment facility will require about three months to construct.

Regional Groundwater Treatment (PE5, PE6, PE8/9)

The OBMPU envisions constructing regional water treatment facilities that treat groundwater from multiple wells to meet drinking water standards for local use and/or export; this would meet the objectives of **PE6** because groundwater treatment facilities would address the contaminants of concern within the Chino Basin based on the recommendations of the *Groundwater Quality Management Plan*. The construction of regional water treatment facilities has the potential to mitigate the effects of Storage and Recovery Program on the remediation projects, which would meet the objectives of **PE 8/9**, the objectives of which are outlined under Section 3.4, Project Characteristics above. Additionally, the construction of regional groundwater treatment facilities meets the objectives of **PE 5**, the objectives of which are outlined under Section 3.4, Project Characteristics above.

<u>Regional Groundwater Treatment: Summary of Facilities</u>

The area expected to be disturbed by the construction and operation of the treatment facilities is expected to be less than 20 acres per facility. New pipelines, booster pumps, reservoirs and related appurtenances will be required to convey groundwater to each treatment plant. The precise number, locations and capacities of the proposed new water treatment plants are presently unknown. However, it is anticipated that the pipelines will be constructed underground and within existing road rights-of-ways. The length of pipelines to convey groundwater the proposed treatment plants is expected to range between 5,000 to 50,000 LF, connecting up to ten wells to the treatment plant. It is assumed that the regional groundwater treatment facilities will be located in close proximity to wells shown in on Exhibit 18 where the water quality in water produced at those wells currently exceed drinking water MCLs.

<u>Regional Groundwater Treatment: Operational Scenario</u>

Operations consist of running and maintaining the treatment plant. The treatment plants are assumed to operate 50 to 90 percent of the time. The energy requirements and chemicals required to operate these plants are presently unknown. Waste generation is presently unknown.

<u>Regional Groundwater Treatment: Construction Scenario</u>

The OBMPU envisions constructing an unknown number of regional water treatment facilities located in the vicinity of multiple wells. The area expected to be disturbed by the construction of the proposed treatment facilities would be 10 acres due to the pipeline installation required to convey water from multiple wells to a centralized location at which the treatment facility will be located. A regional groundwater treatment facility would will range from about 2 acres to 4 acres in size per facility. Construction of water treatment facilities may involve site demolition; site paving; site prep/grading; excavation and installation of yard pipes; installation of treatment facilities; site finishing (landscaping, misc. curb/cutter, etc.); site drainage (above and below grade).[31] Construction equipment would include the following: one bull dozer or motor grader, backhoes, loaders, dump trucks, crew trucks, concrete trucks, cranes, personal vehicles, compactor, delivery trucks, and a water truck. It is anticipated that the maximum number of construction personnel at a site on any given day will be 10 persons. The maximum number of truck deliveries is forecasted at 10 per day at 40-miles round-trip per day of construction. Each regional water treatment facility will require about 12-months to construct.

Improve Existing Groundwater Treatment Facilities (PE5, PE6, PE8/9)

The OBMPU envisions constructing improvements at existing treatment facilities to enable them to continue to treat contaminated groundwater to drinking water standards for local use; this would meet the objectives of **PE6** because groundwater treatment facilities would address the contaminants of concern within the Chino Basin based on the recommendations of the *Groundwater Quality Management Plan*. The improvement of existing groundwater treatment facilities has the potential to mitigate the effects of Storage and Recovery Programs on the remediation projects, which would meet the objectives of **PE 8/9**, the objectives of which are outlined under Section 3.4, Project Characteristics above. Additionally, the construction of improvements at existing treatment facilities meets the objectives of **PE 5**, the objectives of which are outlined under Section 3.4, Project Characteristics above.

Improve Groundwater Treatment Facilities: Summary of Facilities

These treatment plants treat contaminants known at the time they were designed and constructed. New treatment processes may need to be added to these existing plants with current and future drinking water regulations. The capacities of these treatment improvements are presently unknown. The treatment processes that could be used include granulated activated carbon, air stripping, ion exchange, reverse osmosis, biological, and other processes.

Improve Groundwater Treatment Facilities: Operational Scenario

Operations consist of running and maintaining the treatment plant. The treatment plants are assumed to operate 80 to 90 percent of the time. The energy requirements and chemicals required to operate the proposed improvements at these plants are presently unknown. Waste generation associated with the proposed improvements at these plants is presently unknown.

Improve Groundwater Treatment Facilities: Construction Scenario

Construction required to improve existing groundwater treatment facilities are presently unknown, though some of the components provided under Groundwater Treatment at Well Sites: Construction Scenario and Regional Groundwater Treatment: Construction Scenario may apply to the proposed improvements.

3.5.5 Other: Biological Monitoring

3.5.5.1 PBHSP Biological Monitoring (PE1)

The objective of PE 1 under the OBMPU includes continuing the ongoing monitoring and reporting program and developing and updating an *OBMP Monitoring and Reporting Work Plan*, which is considered to be part of the baseline and is included here as it is a part of the comprehensive OBMPU. Watermaster's biological monitoring program is conducted pursuant to the adaptive monitoring program (AMP) for the Prado Basin Habitat Sustainability Program (PBHSP). The

[31] Please refer to the discussion of the construction scenario for conveyance facilities for a depiction of the construction associated with installation of pipeline that may be associated with the proposed regional groundwater treatment facilities.

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 time series 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. Under the OBMPU, Watermaster will continue these efforts.

3.6 ENTITLEMENTS, APPROVALS AND OTHER AGENCY PARTICIPATION

Implementation of future individual project(s) in accordance with the OBMPU may require a variety of approvals from other agencies. This section summarizes agency approvals that have been identified to date. This list may be expanded as the environmental review proceeds. Consequently, it should not be considered exhaustive.

- Notice of Intent (NOI) to the State Water Resources Control Board (SWRCB) for a NPDES general construction stormwater discharge permit. This permit is granted by submittal of an NOI to the SWRCB, but is enforced through a Storm Water Pollution Prevention Plan (SWPPP) that identifies construction best management practices (BMPs) for the site. In the project area, the Santa Ana Regional Water Quality Control Board enforces the BMP requirements described in the NPDES permit by ensuring construction activities adequately implement a SWPPP. Implementation of the SWPPP is carried out by the construction contractor, with the Regional Board and county providing enforcement oversight.

- The project includes the potential discharge of fill into or alterations of "waters of the United States," "waters of the State," and stream beds of the State of California. Regulatory permits to allow fill and/or alteration activities due to project activities such as pipeline installation are likely be required from the Army Corps of Engineers (ACOE), the Regional Board, and California Department of Fish and Wildlife (CDFW) over the life of the OBMPU. A Section 404 permit for the discharge of fill material into "waters of the United States" may be required from the ACOE; a Section 401 Water Quality Certification may be required from the Regional Board; a Report of Waste Discharge may be required from the Regional Board; and a 1600 Streambed Alteration Agreement may be required from the CDFW.

- The U.S. Fish and Wildlife Service (USFWS) and/or CDFW may need to be consulted regarding threatened and endangered species documented to occur within an area of potential impact for future individual projects. This could include consultations under the Fish and Wildlife Coordination Act.

- Land use permits may be required from local jurisdictions, such as individual cities and the two Counties (Riverside and San Bernardino).

- Air quality permits may be required from the South Coast Air Quality Management District (SCAQMD).

- Encroachment permits may be required from local jurisdictions, such as individual cities, California Department of Transportation (Caltrans), the two counties (Riverside and San Bernardino), Flood Control agencies, and private parties such as Southern California Edison, The Gas Company, or others such as BNSF Railway Company.

- Watermaster has a separate approval process for determining material physical injury to the stakeholders within the Chino Basin.

- State Water Resources Control Board will be a responsible agency if permits or funding are requested from the State Revolving Fund Program or Division of Drinking Water.

This is considered to be a partial list of other permitting agencies for future OBMPU future individual projects.

3.7 CEQA RESPONSIBLE AGENCIES

In addition to the above agencies that may be required to review and grant authorizations for future OBMPU projects, the Chino Basin Watermaster functions as a unique entity that has been created by the court. The Watermaster is composed of a Board that consists of member agencies from three groups: an Appropriative Pool, Non-Appropriative Pool, and Agricultural Pool, and four other public agencies (see below), effectively the water producers in the Chino Basin. Individual members of the various pools may assume responsibility for implementing individual projects and activities covered by this OBMPU SEIR. To do this the individual agency would identify a specific project or activity evaluated in this CEQA document and then conduct a shortened environmental review under Sections 15162 and 15168 of the State CEQA Guidelines. Such a review for CEQA compliance could conclude that the project falls within the scope of analysis in this document, i.e., it is consistent with the findings in this PEIR; decide that the proposed project or activity is a minor technical change relative to the OBMPU project description and is subject to an Addendum; or the agency could find that a project or activity exceeds the scope of the this CEQA document's evaluation and requires a supplemental or subsequent environmental document as outlined in State CEQA Guidelines Sections 15162 or 15163. These Responsible Agencies include:

<u>Agricultural Pool, 2019*</u>

State of California, California Institution for Men
State of California, Department of Conservation
State of California, Department of Justice

- Please note that specific companies or parties that are not public agencies are part of the Agricultural Pool, but individuals or group representatives do not have authority to implement CEQA. Please refer to Appendix 1 for a list of all Agricultural Pool participants.

<u>Non-Agricultural Pool, 2019*</u>

City of Ontario
County of San Bernardino
Monte Vista Water District

- Please note that specific companies or parties that are not public agencies are part of the Agricultural Pool, but individuals or group representatives do not have authority to implement CEQA. Please refer to Appendix 1 for a list of Non-Agricultural Pool participants.

Appropriative Pool Committee, 2019

Monte Vista Water District
Cucamonga Valley Water District
City of Chino
City of Chino Hills
City of Fontana
City of Norco
City of Ontario
City of Pomona
City of Upland
County of San Bernardino
Jurupa Community Services District
West Valley Water District

- Please note that specific companies or parties that are not public agencies are part of the Appropriative Pool Committee, but individuals or group representatives do not have authority to implement CEQA. Please refer to Appendix 1 for a list of all Appropriative Pool Committee participants.

Other Agencies Participating in the Judgment/Agreements

IEUA
Three Valleys Municipal Water District
Western Municipal Water District
Chino Basin Water Conservation District

In all future circumstances, IEUA will remain the Lead Agency for the OBMPU CEQA document and the Watermaster will maintain annual records for cumulative projects implemented under the OBMPU on an annual basis. A CEQA Responsible Agency shall coordinate with these agencies when it assumes CEQA Lead Agency status for a future specific project. Thus, IEUA and Watermaster will continue to accumulate information on implementation of the OBMPU and provide a future project specific Lead Agency with essential information regarding the cumulative impact circumstances at the time a proposed specific project is ready for implementation.

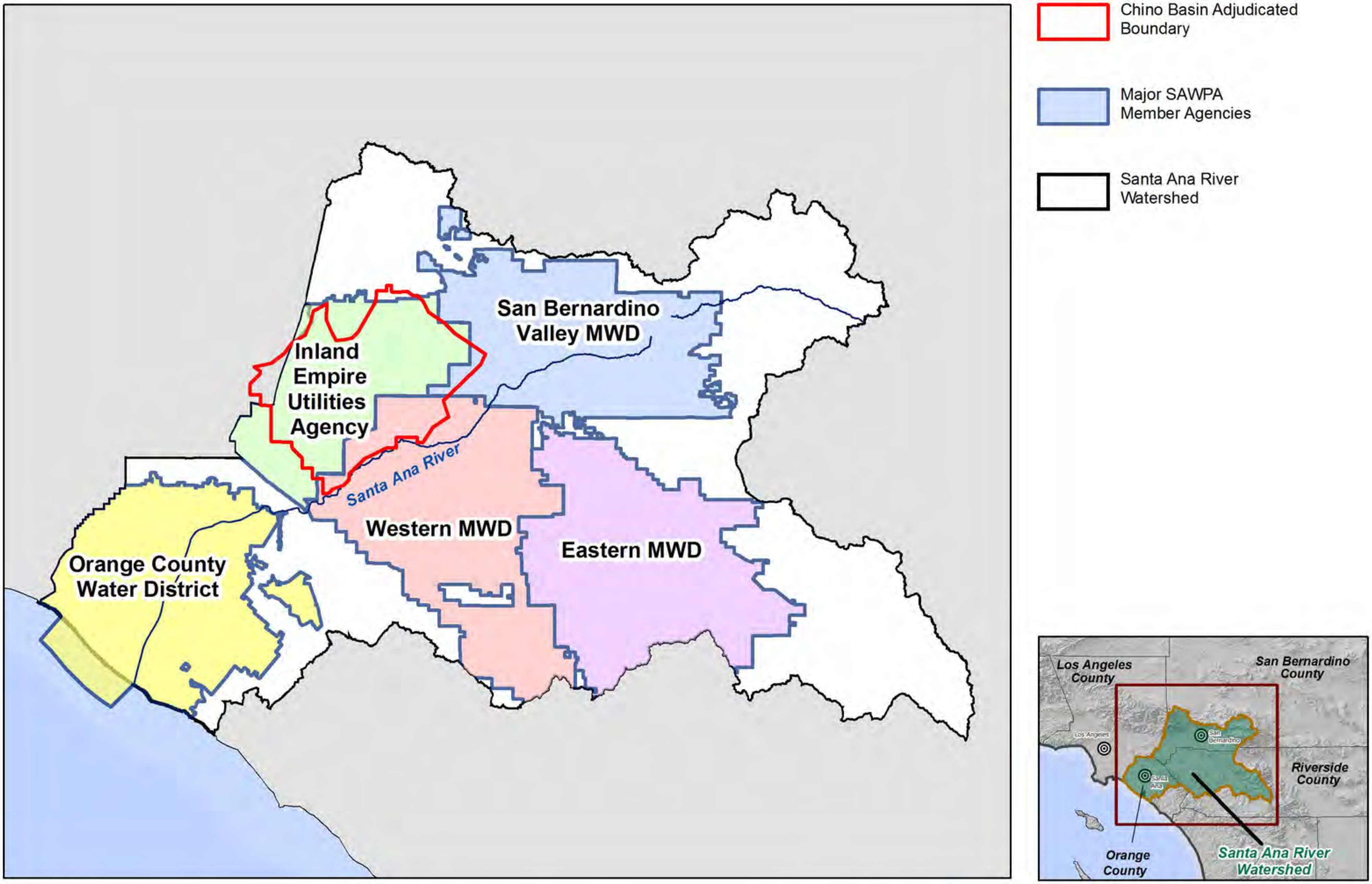
3.8 CUMULATIVE PROJECTS

The intent of a cumulative impact evaluation is to provide the public and decision-makers with an understanding of a given project's contributions to area-wide or community environmental impacts when added to other or all development proposed in an area. The state CEQA Guidelines provide two alternative methods for making cumulative impact forecasts: (1) a list of past, present and reasonably anticipated projects in the project area, or (2) the broad growth impact forecast contained in general or regional plans. Because of the planning character of this project, it will be evaluated in the context of adopted General Plans.

From a water planning perspective, the 2000 OBMP PEIR (Peace I Agreement) and the 2010 Peace II SEIR (Peace II Agreement) represent a cumulative, or carrying capacity, evaluation of water resources in the Chino Basin. Thus, the analysis of Chino Basin water resources contained in this document represents a cumulative analysis of the activities and facilities required to manage the Basin's water resources. No other projects were identified within the project area or vicinity that would contribute directly to cumulative impacts or cumulative demand for local groundwater infrastructure. This does not include individual water infrastructure projects implemented by local water purveyors to supply potable water to customers. Most of the city General Plans for the Chino Basin assume that buildout or near buildout will occur within their jurisdiction by 2050. Thus, substantial general growth in these cities will occur concurrent with the implementation of the OBMPU. Individual water purveyor infrastructure will be implemented as needed in the future as growth occurs in the Chino Basin, but it is not possible to identify future specific projects without speculation. It is assumed that the proponents of such projects will incorporate the impact evaluations in this document as part of their cumulative impact analyses when such specific projects are proposed.

Because the OBMPU addresses comprehensive water management facilities or activities within a portion of the upper Santa Ana River watershed, there may also be other projects within the watershed that will be implemented. The only such project that is currently defined sufficiently to address under this cumulative impact analysis is the Habitat Conservation Plan (HCP) currently under consideration by the San Bernardino Valley Municipal Water District (Valley District). Where pertinent, the impacts from implementing the HCP on behalf of the upper Santa Ana River watershed will be considered in this document as a possible cumulative impact.

Exhibit 1



Produced by:

WEI
Wildermuth Environmental, Inc.

Author: GAR
Date: 12/16/2019
Name: 1.) Chino in SAR Watershed

Prepared for:

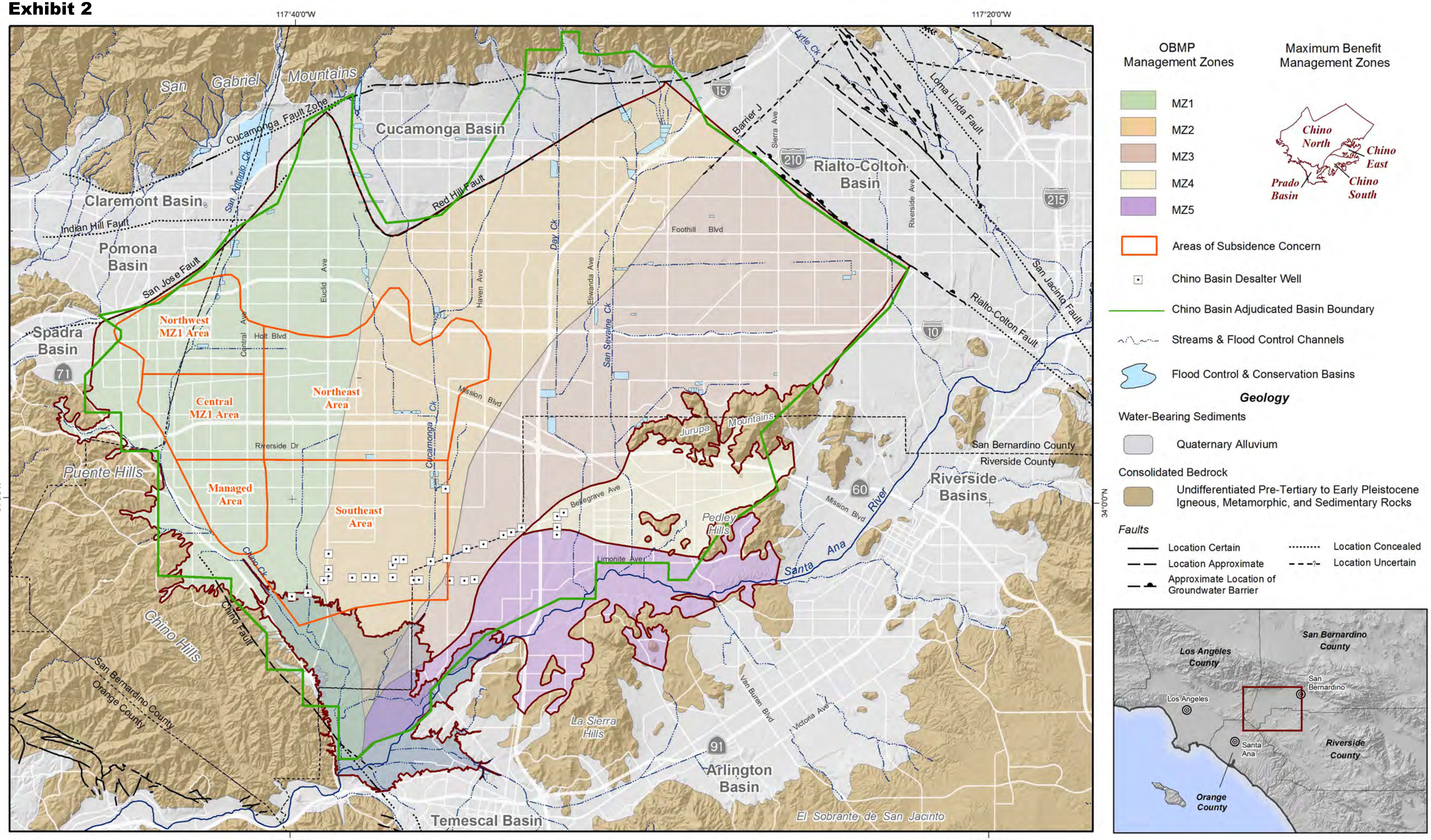
OBMP 2020 Update
Project Description

Chino Basin Watermaster
Partners in Basin Management

Location of the Chino Basin and the Santa Ana River Watershed

Figure 1-1

Exhibit 2



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Author: LG
Date: 12/19/2019
Document Name: 2.) Project Location + Bulletin 118

0 1 2 3 4 5 Miles
0 2 4 6 8 KM

Prepared for:

OBMP 2020 Update
Project Description

Chino Basin

OBMP Management Zones, Maximum Benefit Management Zones and Areas of Subsidence Concern

Figure 1-1

Exhibit 3

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

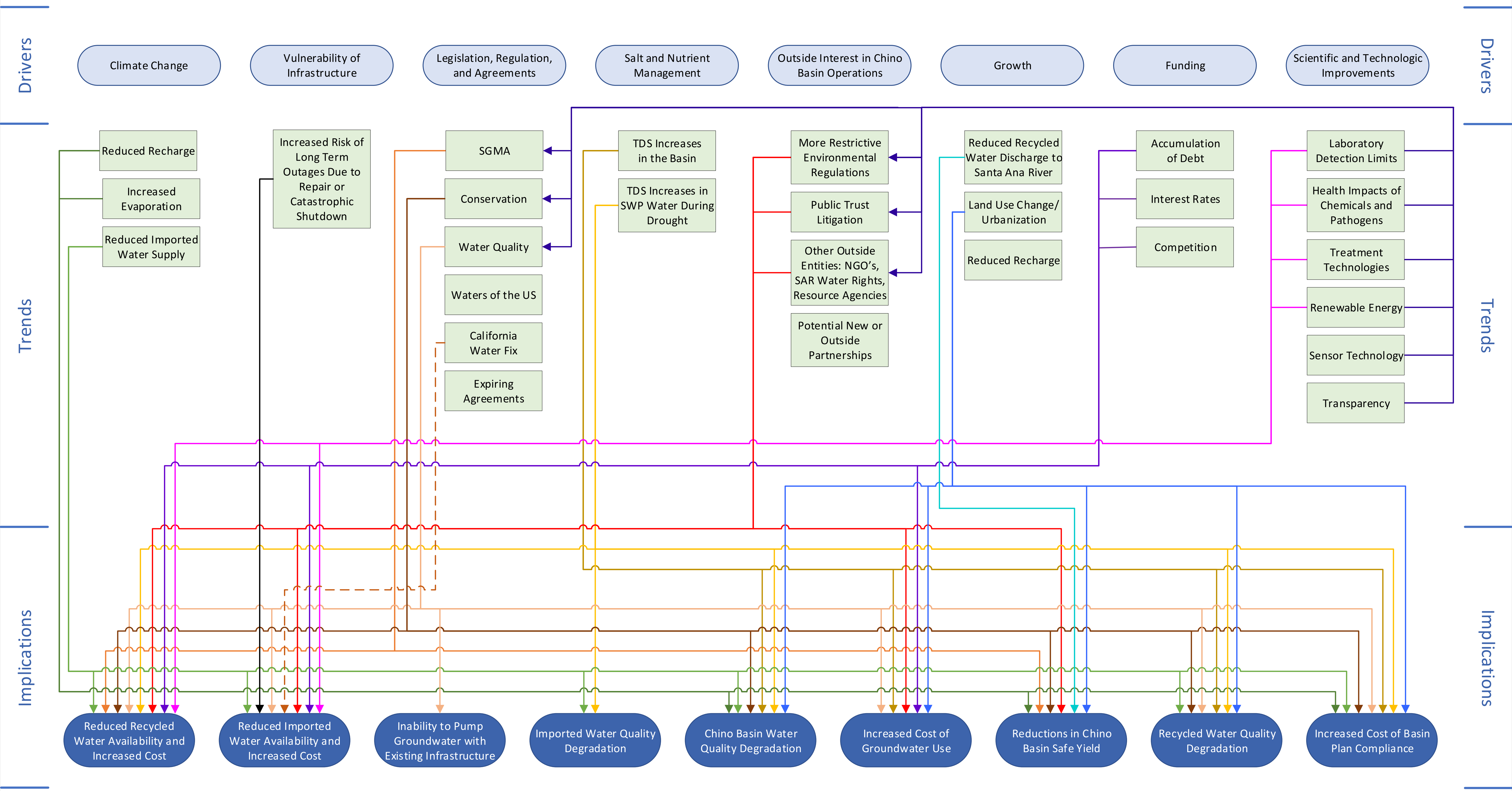


Exhibit 4

Implementation actions for the next 20 years by Program Element
Program Element 1
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.
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* .
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.
Program Element 2
Continue to convene the Recharge Investigations and Projects Committee.
Complete the 2023 Recharge Master Plan Update (RMPU).
Implement recharge projects based on need and available resources.
Update the RMPU no less than every five years (2028, 2033, 2038).
Program Element 4
Implement Watermaster's Subsidence Management Plan, and adapt it as necessary.
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.
Program Element 5
The IEUA will maximize the reuse of its recycled water in the Chino Basin.
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.
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.
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.
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.

Implementation actions for the next 20 years by Program Element
Program Element 6
Re-convene the water quality committee and meet periodically to update groundwater quality management priorities.
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* and prepare a long-term emerging contaminants monitoring plan.
Continue to support the Parties in identifying funding from outside sources to finance cleanup efforts.
Develop and implement a *Groundwater Quality Management Plan* and periodically update it.
Implement long-term emerging contaminants monitoring plan.
Continue to conduct investigations to assist the parties and/or the Regional Board in accomplishing mutually beneficial objectives as needed.
Implement projects of mutual interest.
Program Element 7
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.
Continue to implement the maximum-benefit salt and nutrient management plan pursuant to the Basin Plan.
Starting in 2025 and every five years thereafter, update water quality projections to evaluate compliance with the maximum-benefit salt and nutrient management plan.
Program Element 8/9
Complete and submit to the Court the 2020 Safe Yield Recalculation.
Complete and submit to the Court the 2020 Storage Management Plan (SMP).
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.
Assess losses from storage accounts based on the findings of the 2020 Safe Yield Recalculation.
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
Perform safe yield recalculation every 10 years (2030, 2040).
Update the storage loss rate following each recalculation of Safe Yield (2030, 2040) and during periodic updates of the SMP.

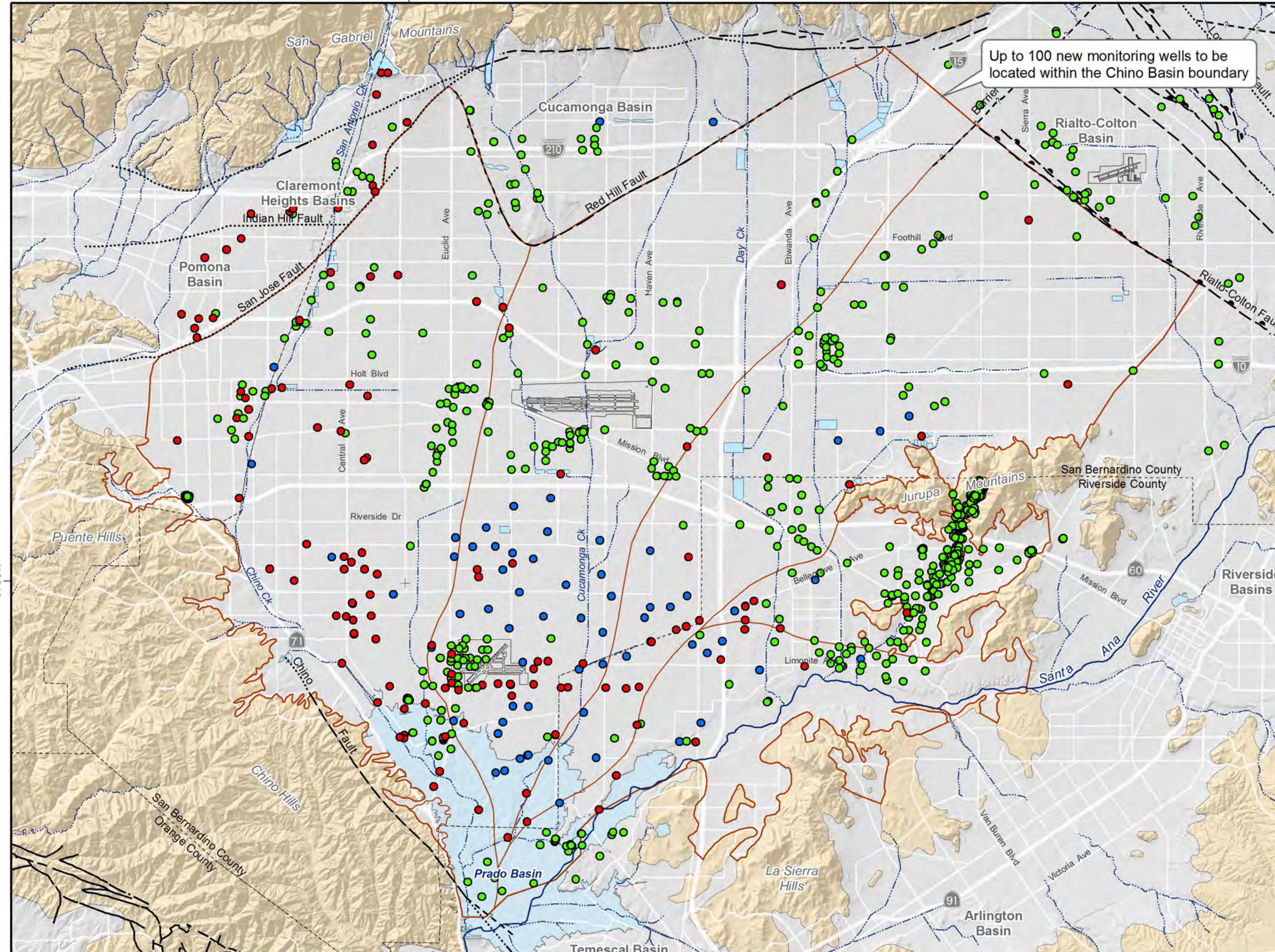
Actions in blue represent actions that are not in the 2000 OBMP ("new" actions).

Exhibit 5

List of facilities to be evaluated in CEQA	PE1	PE2	PE4	PE5	PE6	PE7	PE8/9
New monitoring wells	✓	✓	✓	✓	✓	✓	✓
New surface water and groundwater recharge monitoring facilities	✓	✓					✓
New meteorological monitoring facilities	✓	✓					✓
New meter installation at pumping wells	✓						
New extensometers	✓		✓				✓
New benchmarks	✓		✓				✓
New stormwater diversion, storage, transfer and recharge facilities		✓	✓	✓			✓
CIM storage facilities*		✓	✓	✓			✓
Flood MAR*		✓	✓	✓			✓
Regional conveyance:*		✓	✓	✓			✓
Lower Cucamonga Basin		✓		✓			✓
Mills Wetlands		✓		✓			✓
Riverside Basin		✓		✓			✓
Vulcan Basin *		✓		✓			✓
Confluence Project*		✓		✓			✓
Injection wells*		✓	✓	✓			✓
Treatment (for some sources)*		✓	✓	✓			✓
Restore WFA Agua de Lejos Treatment Plant capacity for in-lieu recharge		✓	✓	✓			✓
MS4 recharge project incentives		✓	✓				✓
Relocate pumping from MZ1 to MZ2/3 and southern portion of the Chino Basin and/or increase recharge in MZ1			✓				✓
New production wells*			✓				✓
Acquire supplemental water supplies*		✓		✓			
Regional conveyance				✓			✓
New dedicated regional conveyance facilities				✓			✓
North-south pipeline*				✓			✓
East-west pipeline*				✓			✓
Incorporate local conveyance facilities into a regional conveyance system*				✓			✓
Maximize recycled water reuse				✓			
Expand system for indirect reuse*				✓			
Advanced water treatment*				✓		✓	
Direct potable use*				✓			
New regional groundwater treatment plants (up to 10 mgd for local use; up to 30 mgd for export)*				✓	✓		✓
Expansion of existing groundwater treatment plants*				✓	✓		✓
Upgrade recycled water treatment plant to desalt effluent*						✓	
Maintain or increase groundwater pumping in Chino Creek Well Field (CCWF) area:							
New production wells in CCWF area*						✓	✓
Acquire wells in CCWF area*						✓	✓
New ASR wells in MZ2/3 north of Highway 60*							✓

*Includes conveyance infrastructure

Exhibit 6



Groundwater-Level Monitoring Program
Wells symbolized by Measurement Frequency

- Measurement by CBWM Staff - Monthly (69 wells)
- Measurement by Transducer - Every 15 Minutes (177 wells)
- Measurement by Owner at Various Frequencies (1,077 wells)

OBMP Management Zones

Streams & Flood Control Channels

Flood Control & Conservation Basins

Geology

Water-Bearing Sediments

Quaternary Alluvium

Consolidated Bedrock

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

Faults

Location Certain
Location Approximate
Approximate Location of Groundwater Barrier
Location Concealed
Location Uncertain

Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: SO
Date: 12/17/2019
File: 6.) Map of GWL.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

Prepared for:
OBMP 2020 Update
Scoping Report

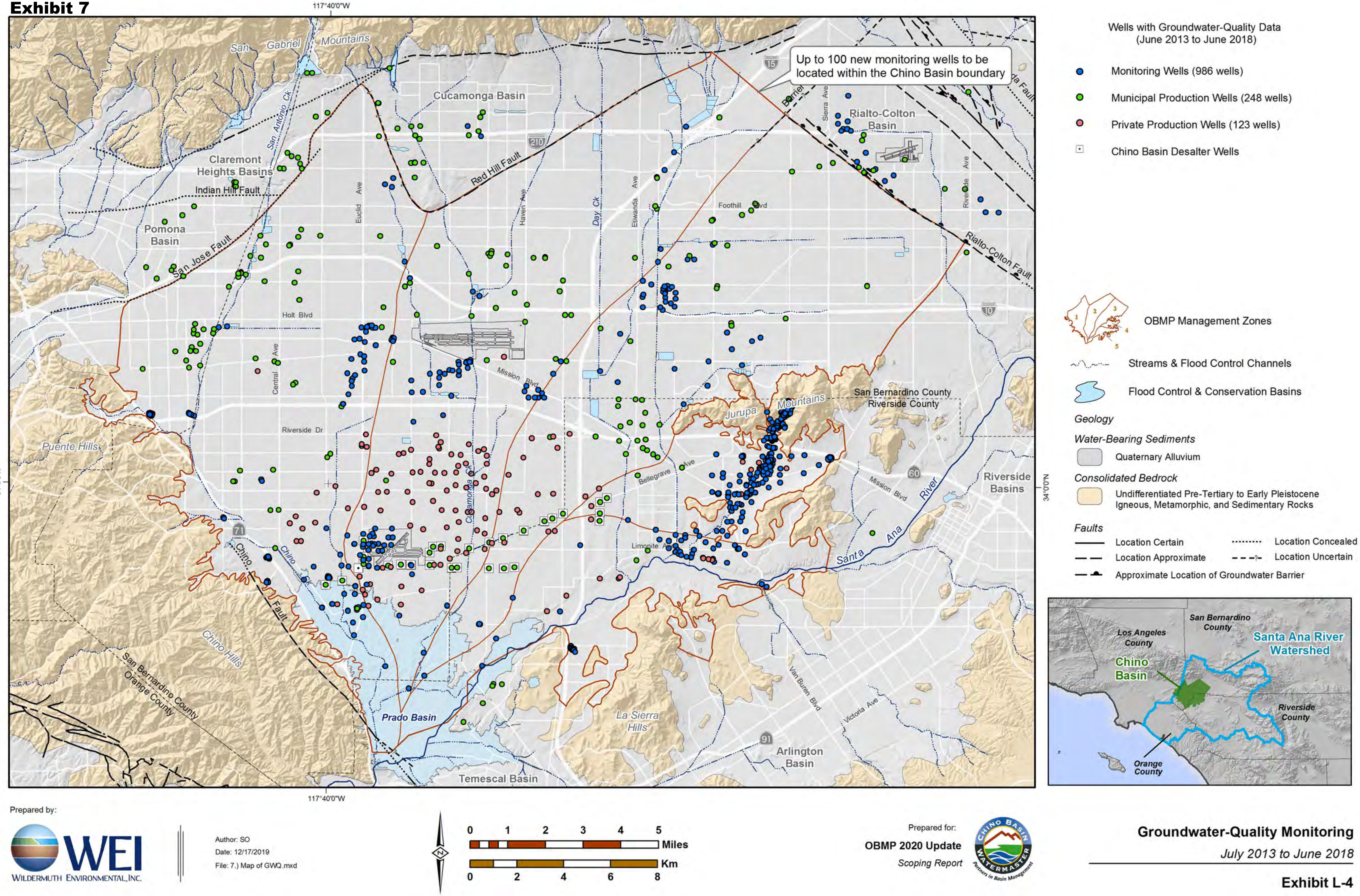
Chino Basin Watermaster
Partners in Basin Management

Groundwater-Level Monitoring

Well Location and Measurement Frequency
Fiscal Year 2017/18

Exhibit L-3

Exhibit 7



Prepared by:

WEI
WILDERMUTH ENVIRONMENTAL, INC.

Author: SO
Date: 12/17/2019
File: 7.) Map of GWQ.mxd

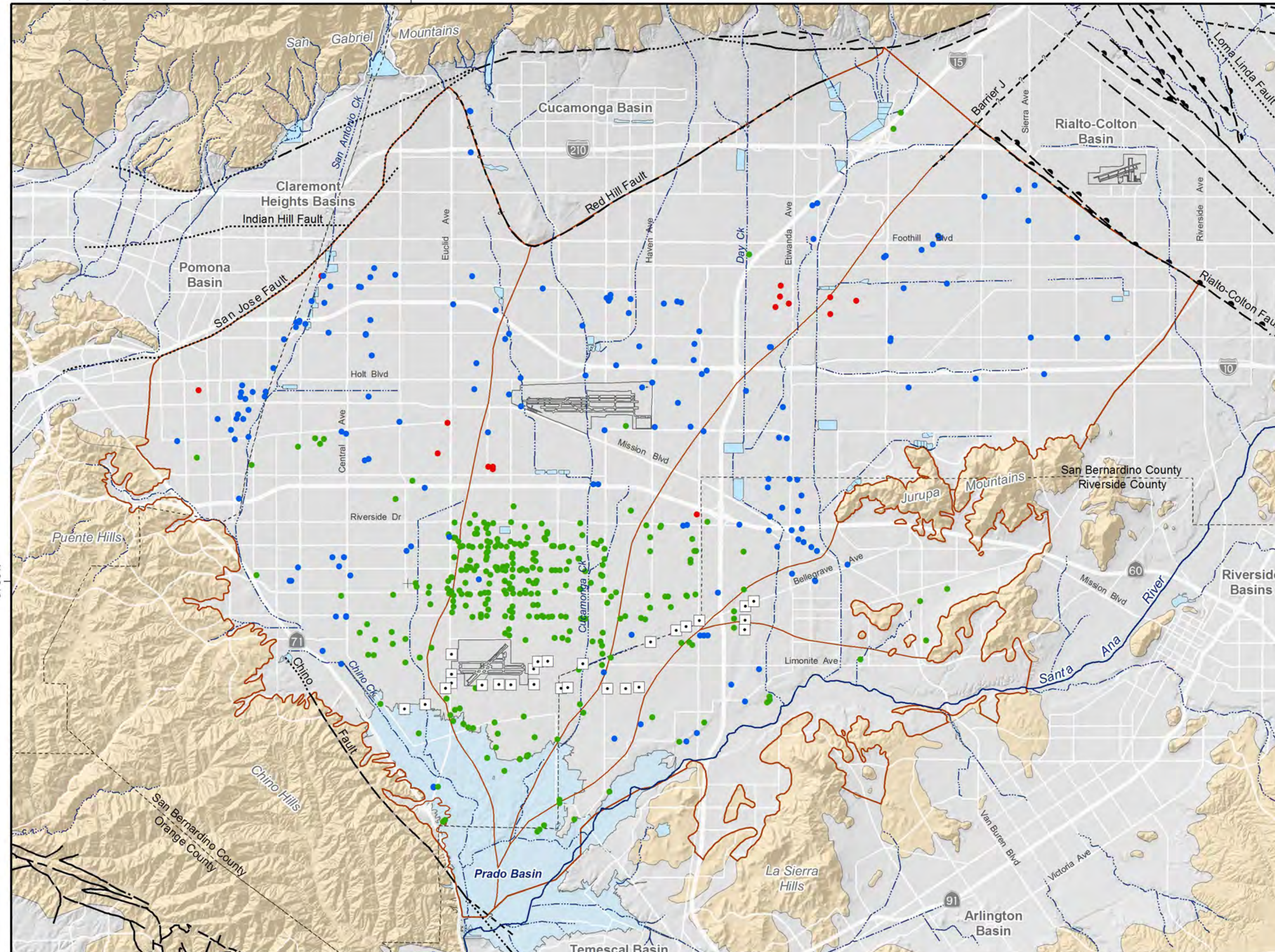
Prepared for:

OBMP 2020 Update
Scoping Report

Groundwater-Quality Monitoring
July 2013 to June 2018

Exhibit L-4

Exhibit 8



Groundwater Production Wells by Pool

- Agricultural Pool (Pool 1 - 276 Wells) *Potential to install in-line flow meters*
- Overlying Non-Agricultural Pool (Pool 2 - 13 Wells)
- Appropriative Pool (Pool 3 - 143 Wells)
- Chino Basin Desalter Authority (25 Wells)

OBMP Management Zones

Streams & Flood Control Channels

Flood Control & Conservation Basins

Geology

Water-Bearing Sediments

Quaternary Alluvium

Consolidated Bedrock

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

Faults

- Location Certain
- Location Approximate
- Approximate Location of Groundwater Barrier
- Location Concealed
- Location Uncertain

Prepared by:

WEI
WILDERMUTH ENVIRONMENTAL, INC.

Author: SO
Date: 12/16/2019
File: 8.) Map of GWP.mxd

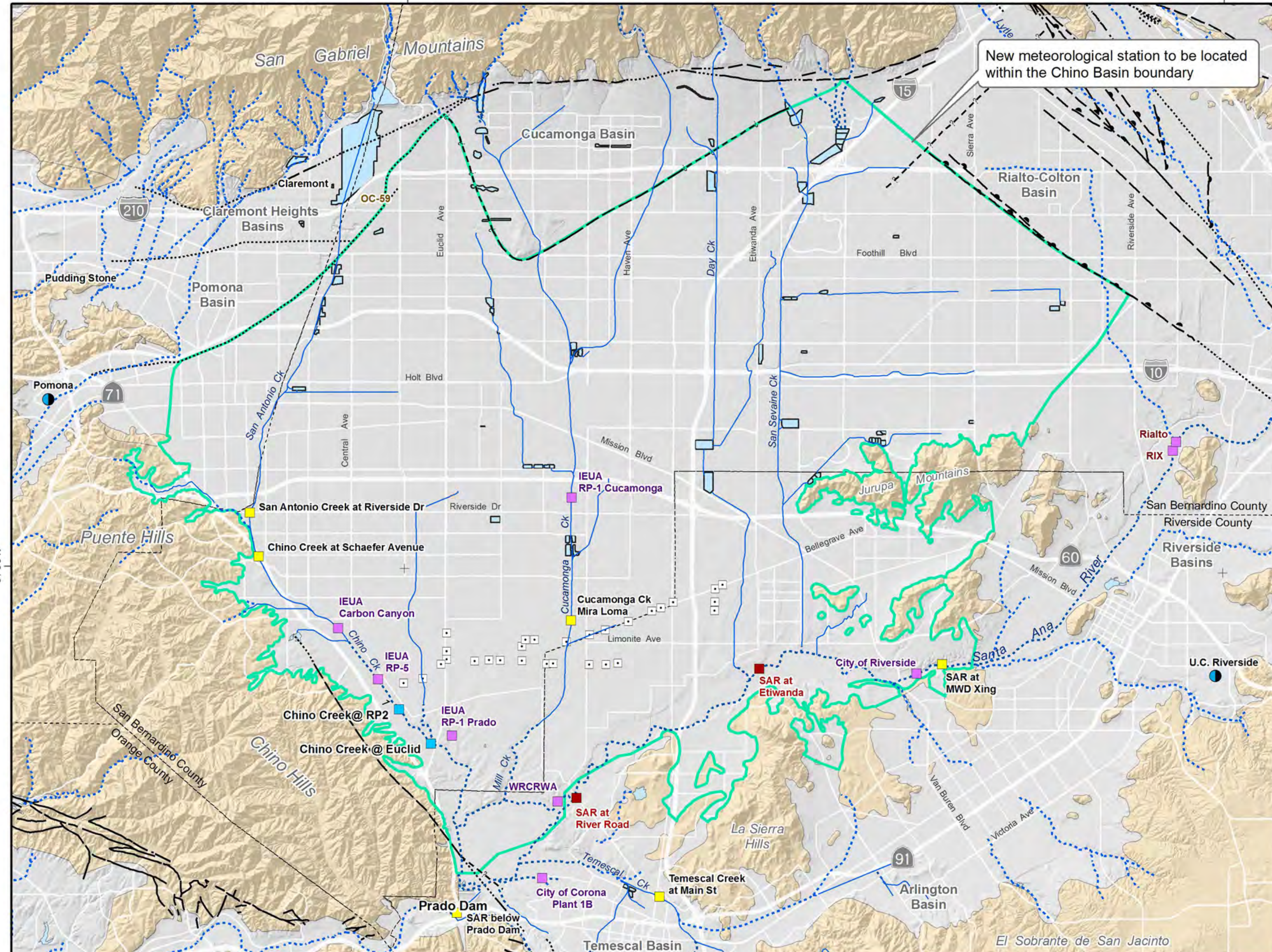
0 1 2 3 4 5 Miles
0 2 4 6 8 Km

Prepared for:
OBMP 2020 Update
Scoping Report

Groundwater-Production Monitoring
Fiscal Year 2017/18

Exhibit L-2

Exhibit 9



Concrete-Lined Channels

Unlined Rivers and Streams

Flood Control & Conservation Basins

Locations of new flow and stage measuring equipment

Surface-Water Monitoring Program

POTW Discharge Outfall

USGS Stream Gage Station

Maximum-Benefit Monitoring Program Site

PBHSP Site

Climate Monitoring Program

CIMIS Stations (Temperature and Evaporation)

Chino Basin - Area to Extract Grided Data from PRISM and NEXRAD Data Sets (Precipitation)

Chino Basin Desalter Authority Well

Geology

Water-Bearing Sediments

Quaternary Alluvium

Consolidated Bedrock

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

Faults

Location Certain

Location Concealed

Location Approximate

Location Uncertain

Approximate Location of Groundwater Barrier

Prepared by:

WEI WILDERMUTH ENVIRONMENTAL, INC.

Author: SO
Date: 12/19/2019
File: 9.) Map of SWQ

0 1 2 3 4 5 Miles

0 2 4 6 8 Km

Prepared for:

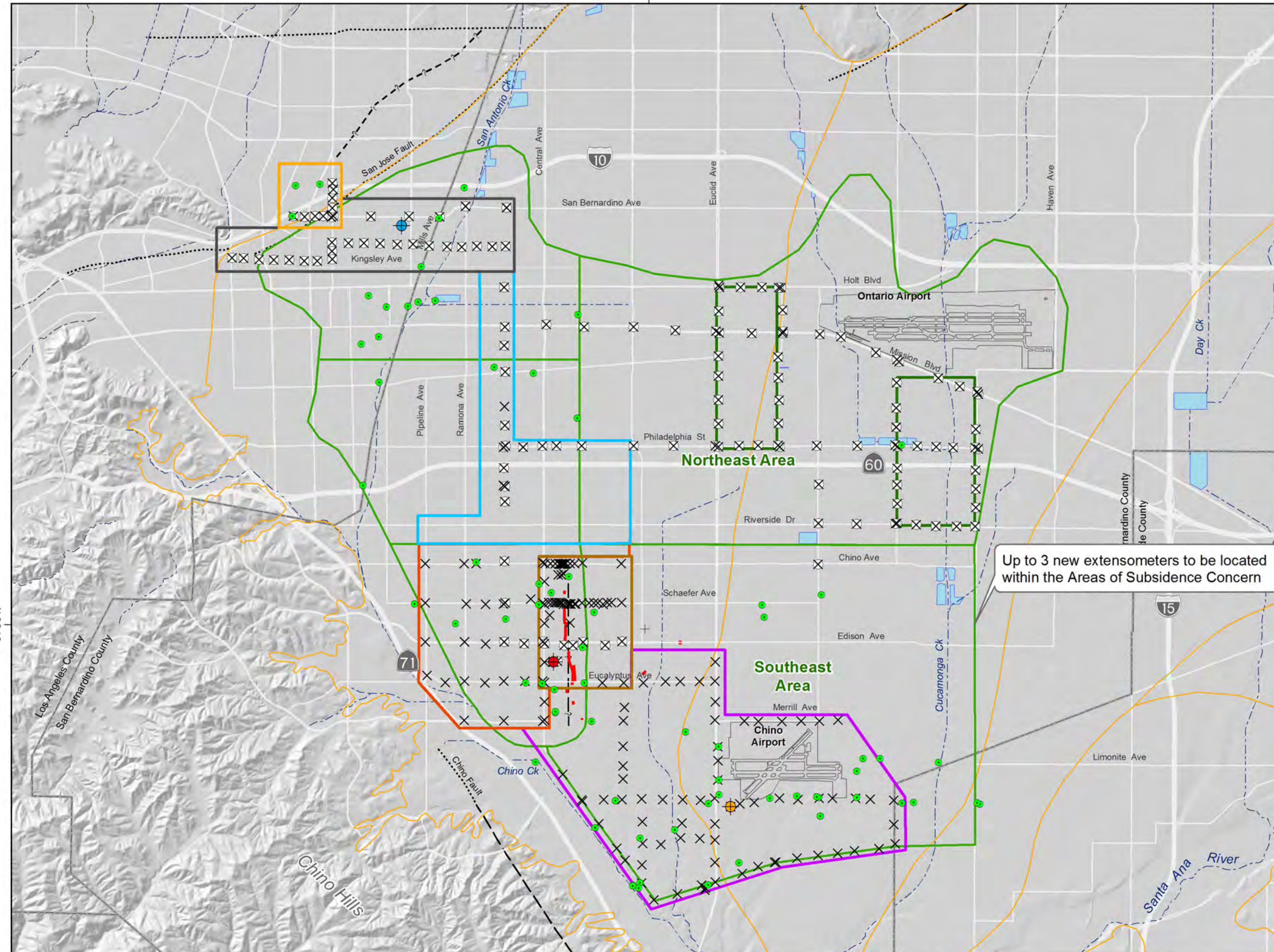
OBMP 2020 Update

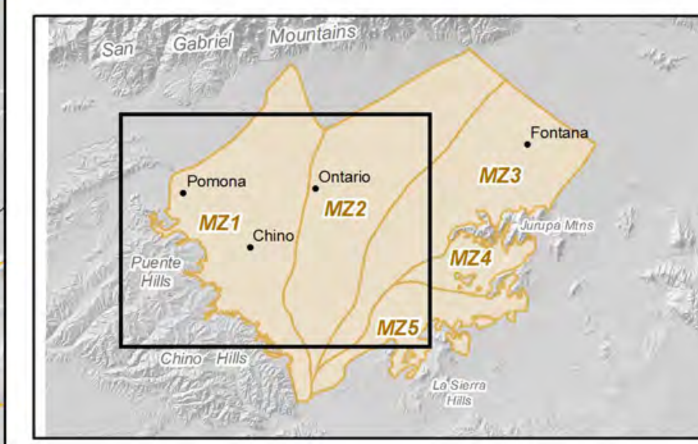
Scoping Report

Surface-Water and Climate Monitoring

Exhibit L-5

Exhibit 10





Ground-Level Monitoring Network Facilities

- Ayala Park Extensometer
- Chino Creek Extensometer
- Pomona Extensometer
- Well Equipped with Pressure Transducer (2018/19)
- Ground-Level Survey Benchmark
- Ground-Level Survey Benchmark (Measured in April 15, 2019)

Ground-Level Survey Areas

- Managed Area
- Fissure Zone Area
- Central Area
- Northwest Area
- San Jose Fault Zone Area
- Northeast Area
- Southeast Area

- Areas of Subsidence Concern
- Flood Control and Conservation Basins
- Fault (solid where accurately located; dashed where approximately located or inferred; dotted where concealed)
- Ground Fissures
- Approximate Location of the Riley Barrier

Prepared by:

WEI
WILDERMUTH ENVIRONMENTAL, INC.

Author: NWS
Date: 12/18/2019
File: 10.) Subsidence Monitoring.mxd

0 1 2 3 4 5 Miles

0 2 4 6 8 Km

Prepared for:

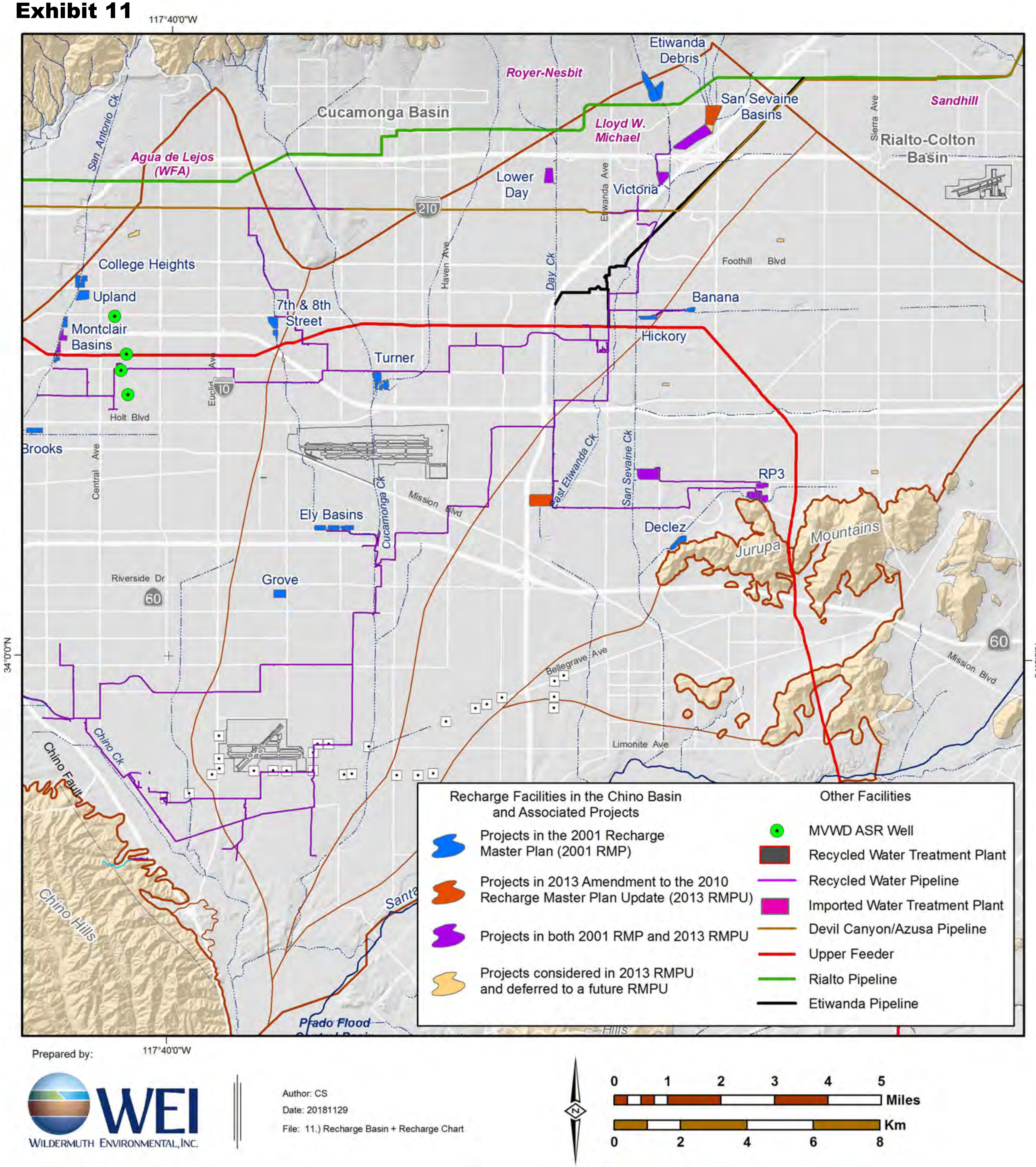
OBMP 2020 Update
Scoping Report

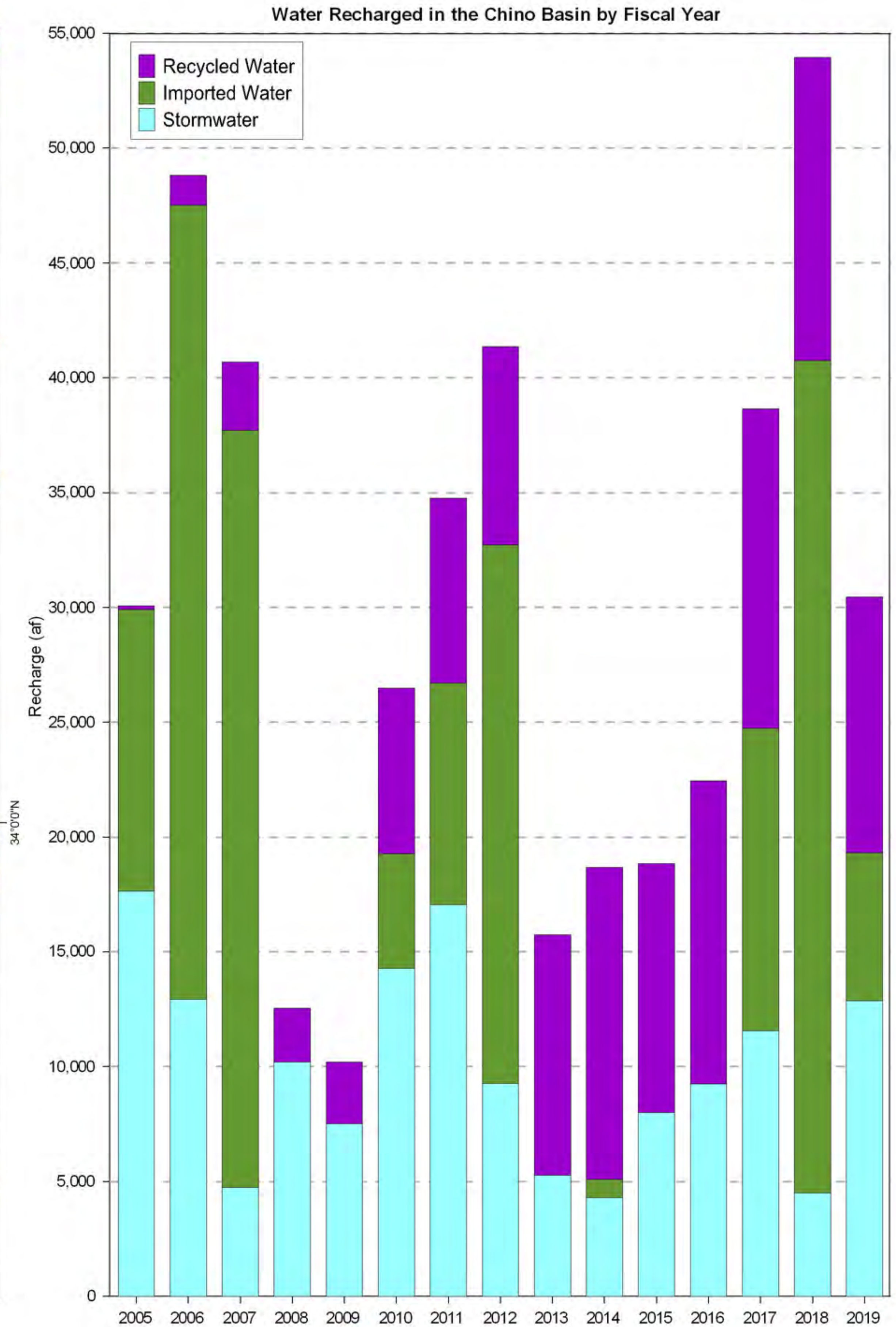
CHINO BASIN WATERMASTER — Partners in Basin Management

Ground-Level Monitoring Network
Western Chino Basin

Exhibit L-6

Exhibit 11





Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: CS
Date: 20181129
File: 11.) Recharge Basin + Recharge Chart

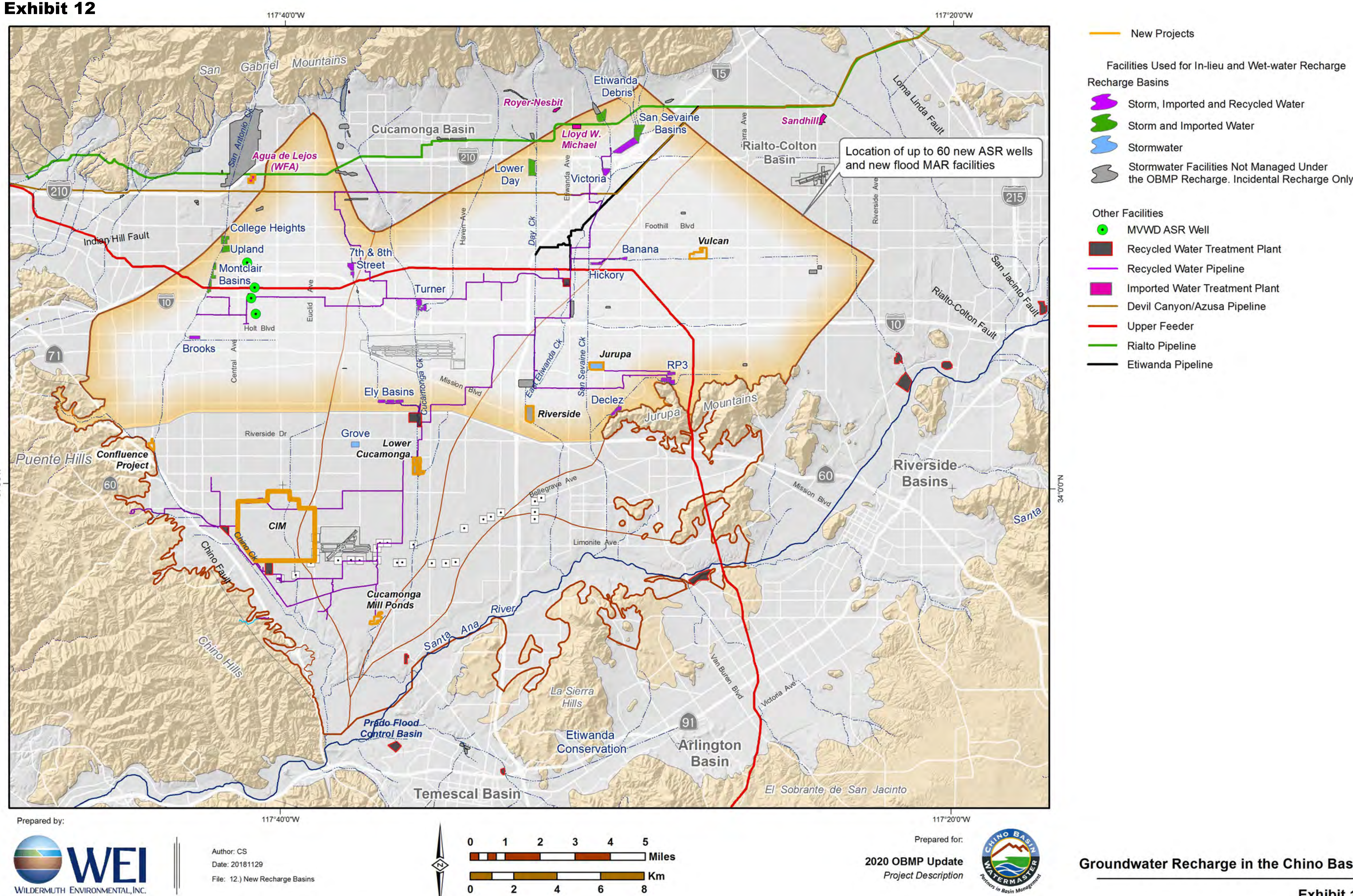
Prepared for:

2020 OBMP Update
Project Description

Groundwater Recharge in the Chino Basin

Exhibit 10

Exhibit 12



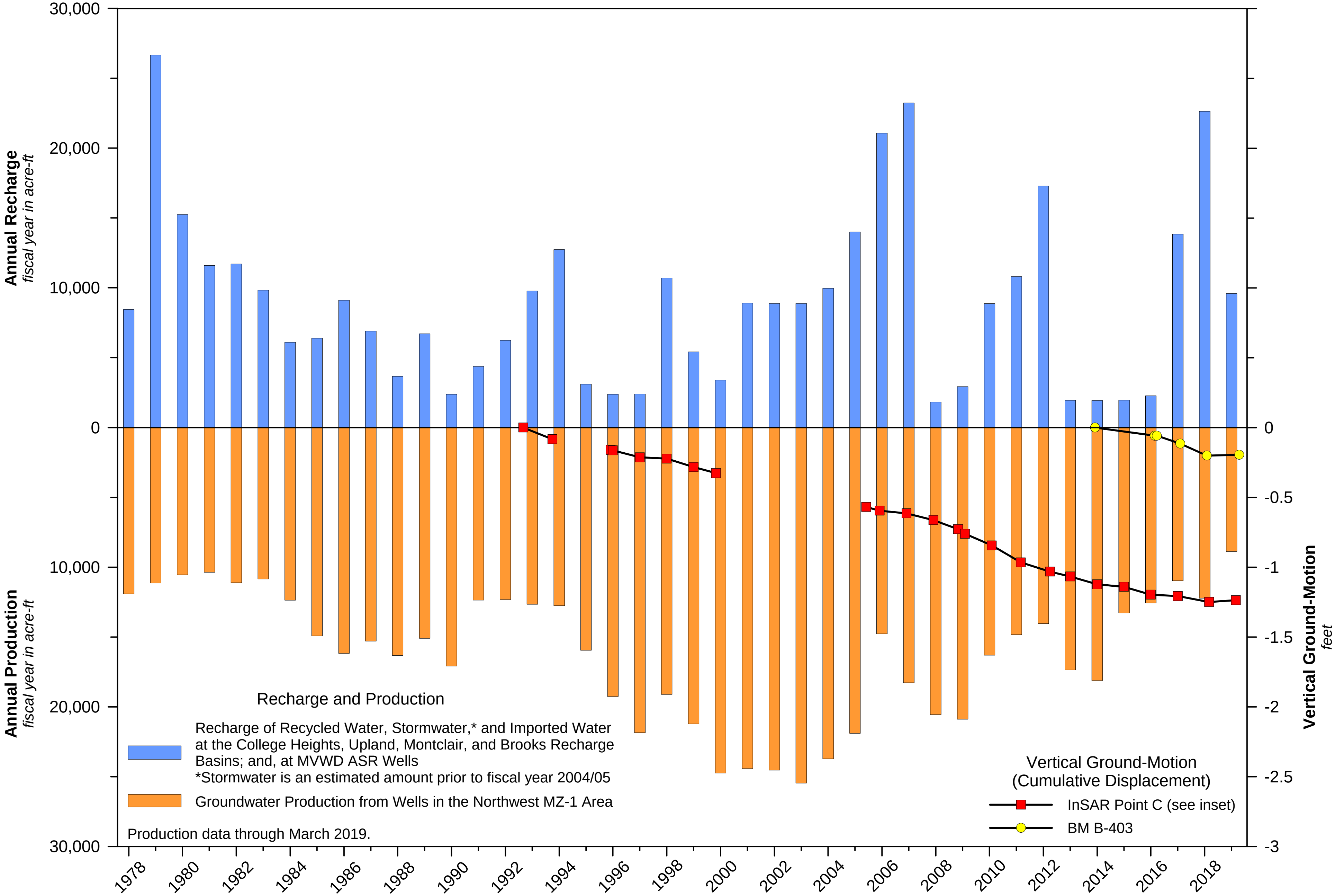
WEI Wildermuth Environmental, Inc.

2020 OBMP Update
Project Description

Groundwater Recharge in the Chino Basin

Exhibit 11

Exhibit 13



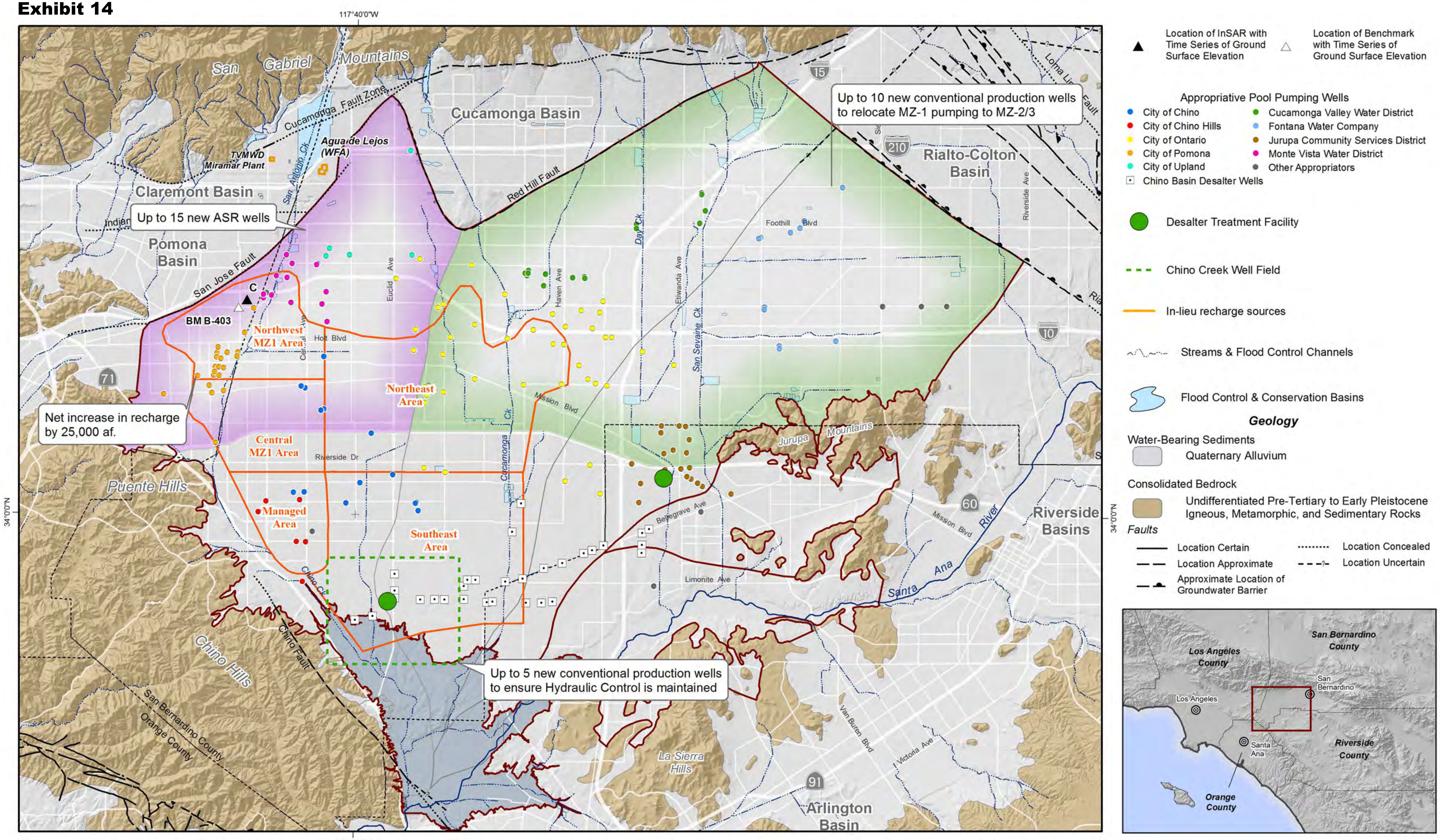
WEI
Wildermuth Environmental, Inc.

Prepared for:
OBMP 2020 Update
Scoping Report

Pumping, Recharge and Land Subsidence in the Northwest MZ-1 Area

Exhibit CG-3

Exhibit 14



Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: LG
Date: 12/20/2019
Document Name: 14.) Map of Chino Basin Concerns_new

0 1 2 3 4 5 Miles
0 2 4 6 8 KM

Prepared for:

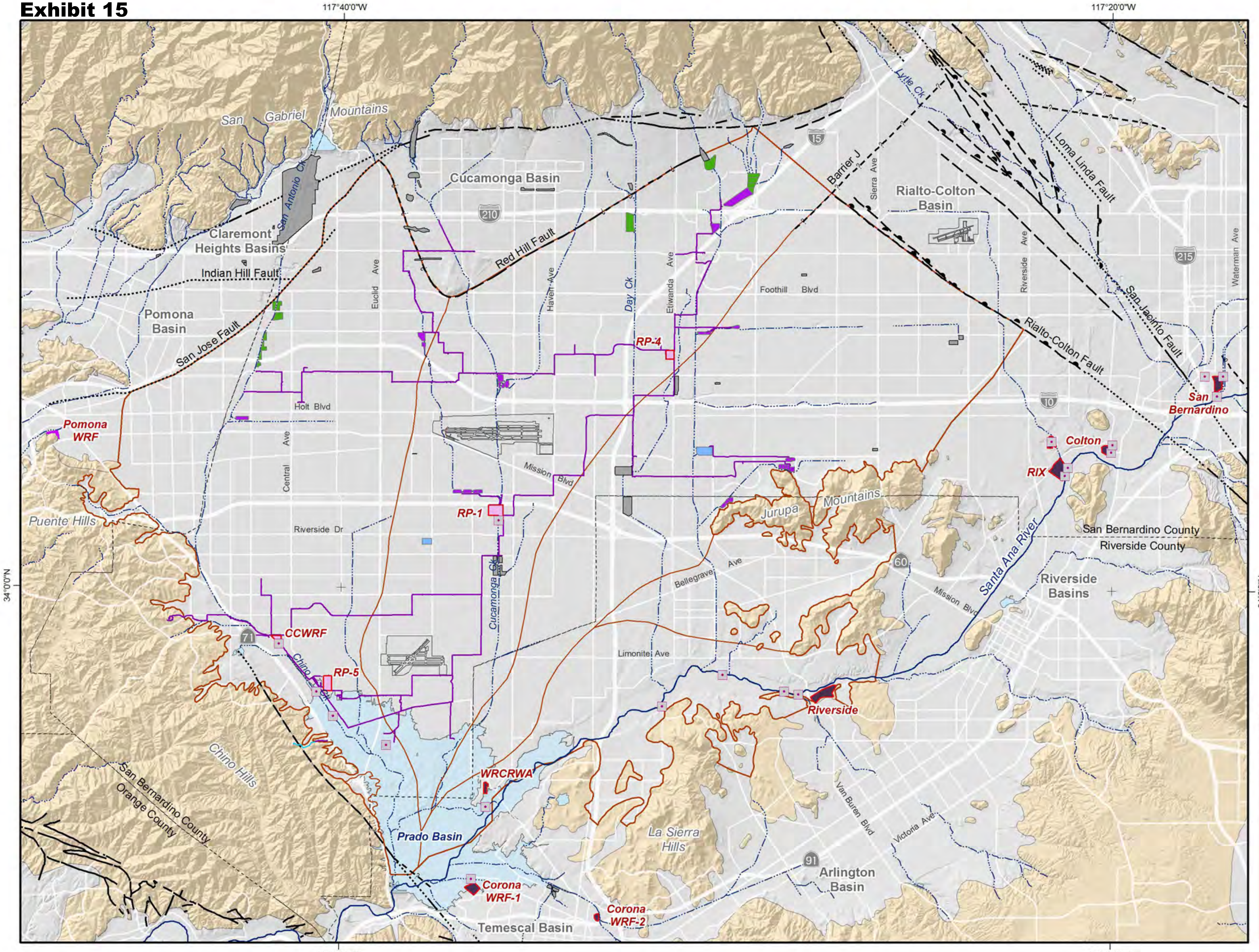
OBMP 2020 Update
Project Description

Chino Basin

OBMP Management Zones, Maximum Benefit Management Zones and Areas of Subsidence Concern

Figure 1-1

Exhibit 15



IEUA's Recycled Water Treatment Plant

Recycled Water Discharge Point

Recycled Water Distribution System

Recharge Basins

Storm, Imported and Recycled Water

Storm and Imported Water

Stormwater

Stormwater Facilities Not Managed Under the OBMP Recharge. Incidental Recharge Only

Other Recycled Water Treatment Plant

OBMP Management Zones

Streams & Flood Control Channels

Faults

Location Certain — Location Concealed

Location Approximate — Location Uncertain

Approximate Location of Groundwater Barrier

Geology

Water-Bearing Sediments

Quaternary Alluvium

Consolidated Bedrock

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: SO
Date: 12/20/2019
File: 15.) RW Treatment Plants.mxd

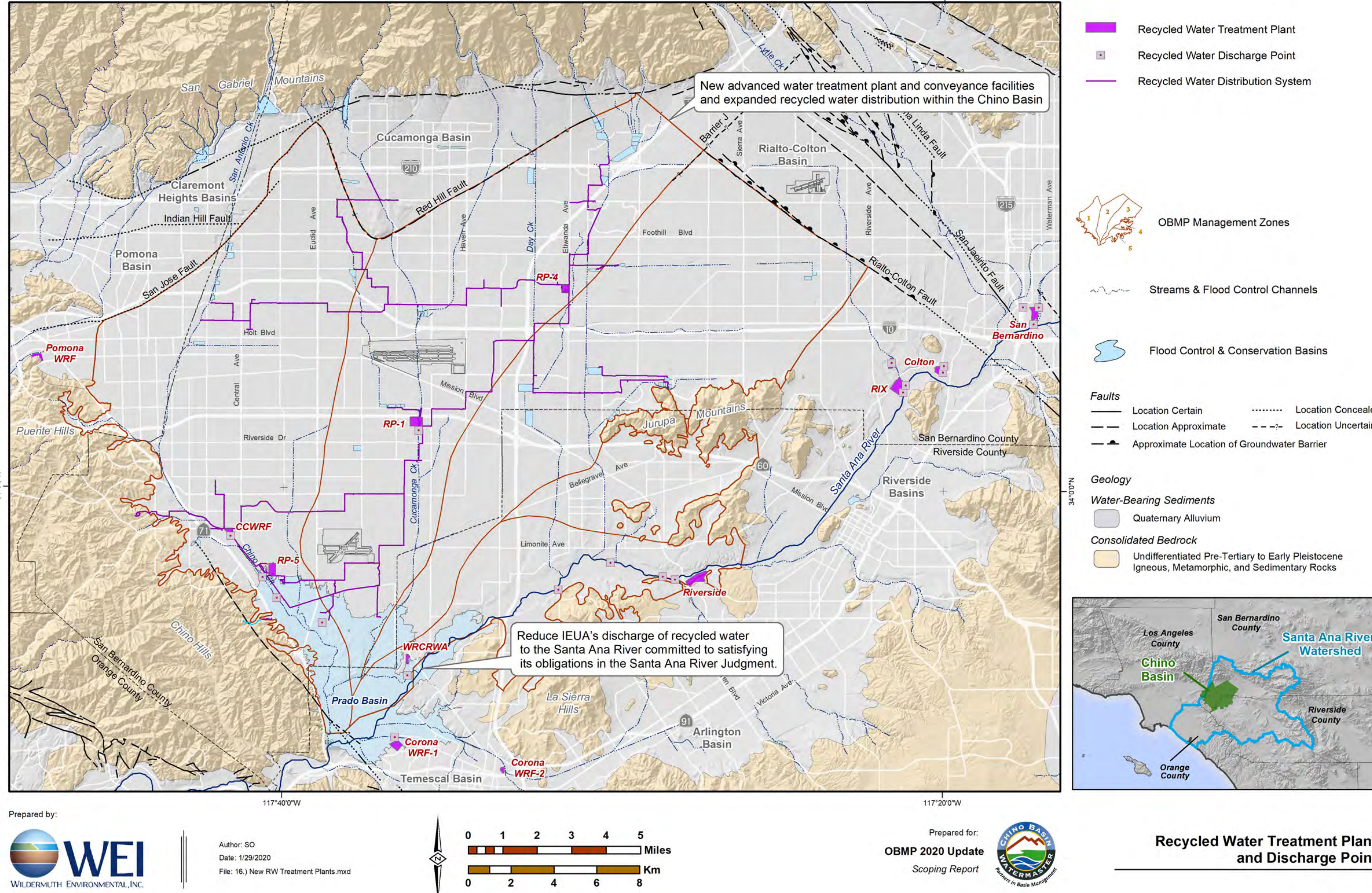
0 1 2 3 4 5 Miles
0 2 4 6 8 Km

Prepared for:
OBMP 2020 Update
Scoping Report

Recycled Water Treatment Plants and Discharge Points

Exhibit D-1

Exhibit 16



Prepared by:

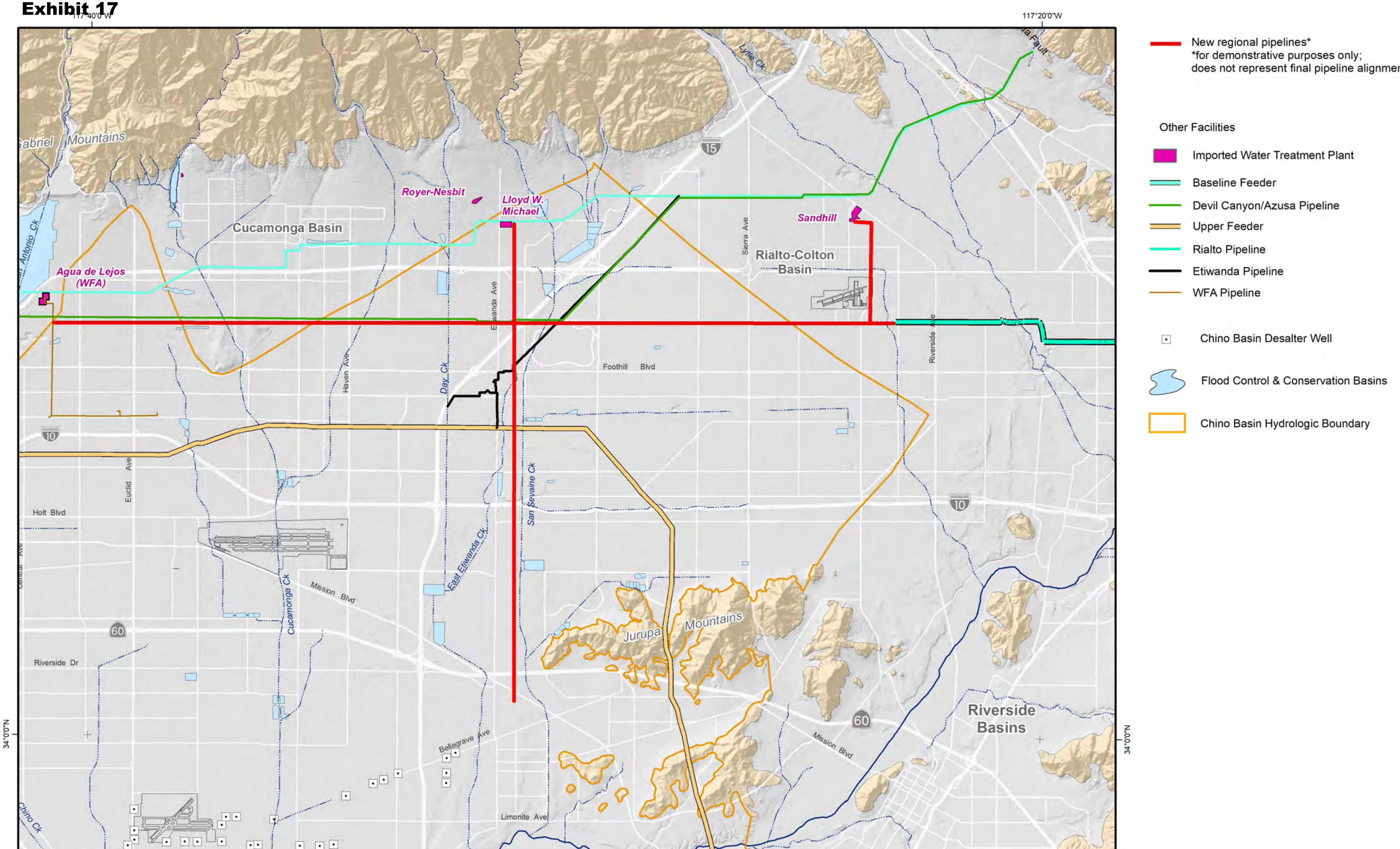
WEI
WILDERMUTH ENVIRONMENTAL, INC.

Author: SO
Date: 1/29/2020
File: 16.) New RW Treatment Plants.mxd

Prepared for:
OBMP 2020 Update
Scoping Report

Recycled Water Treatment Plants and Discharge Points

Exhibit 17



Prepared by:

WEI
WILDERMUTH ENVIRONMENTAL, INC.

Author: CS
Date: 202001
File: 17.) Regional Pipelines

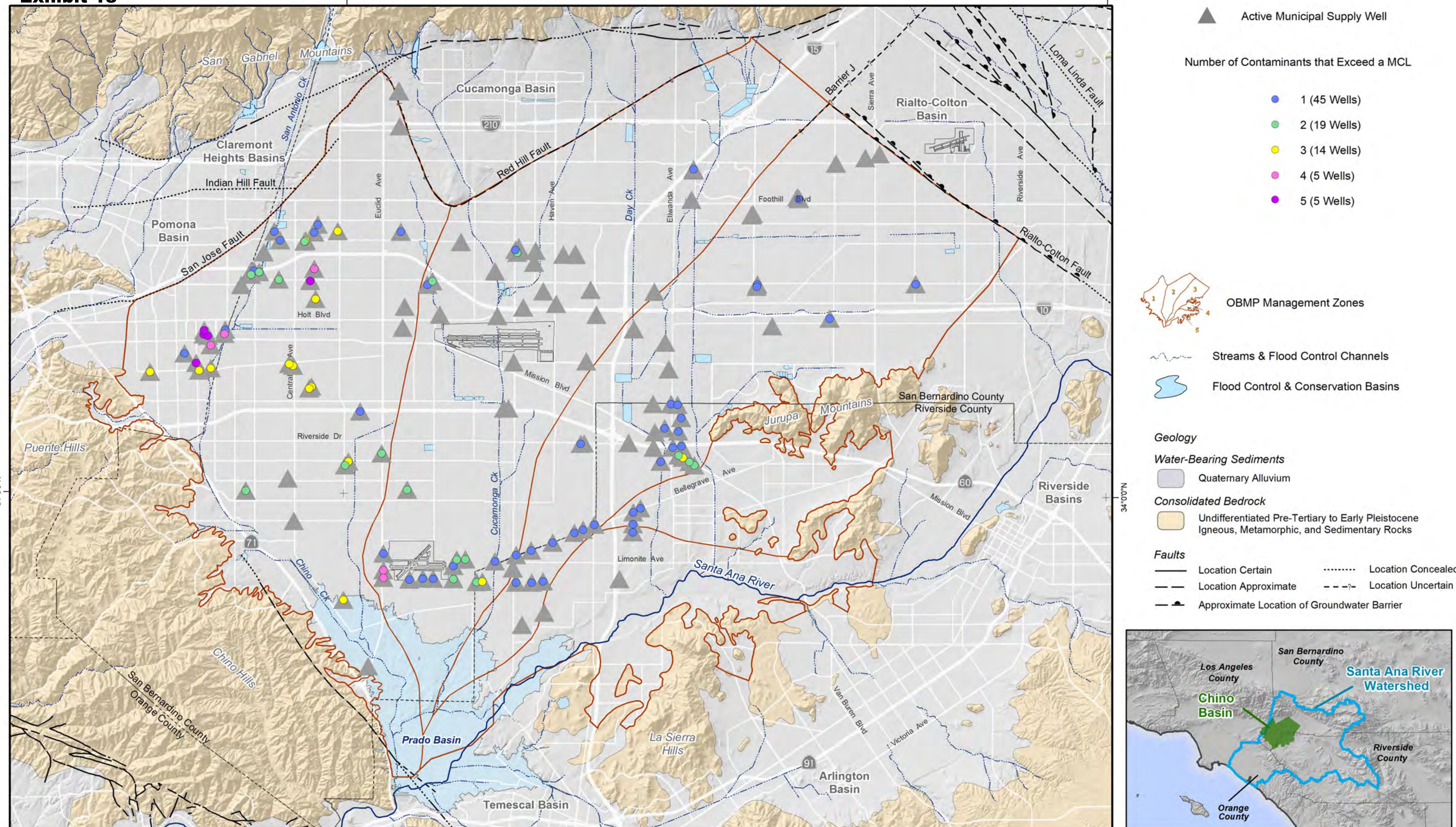
Prepared for:

2020 OBMP Update
Project Description

CHINO BASIN WATERMASTER
Partners in Basin Management

Regional Pipelines

Exhibit 18



Prepared by:

WEI Wildermuth Environmental, Inc.

Author: CS
Date: 1/30/2020
File: 18.) Exceedance_Count.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

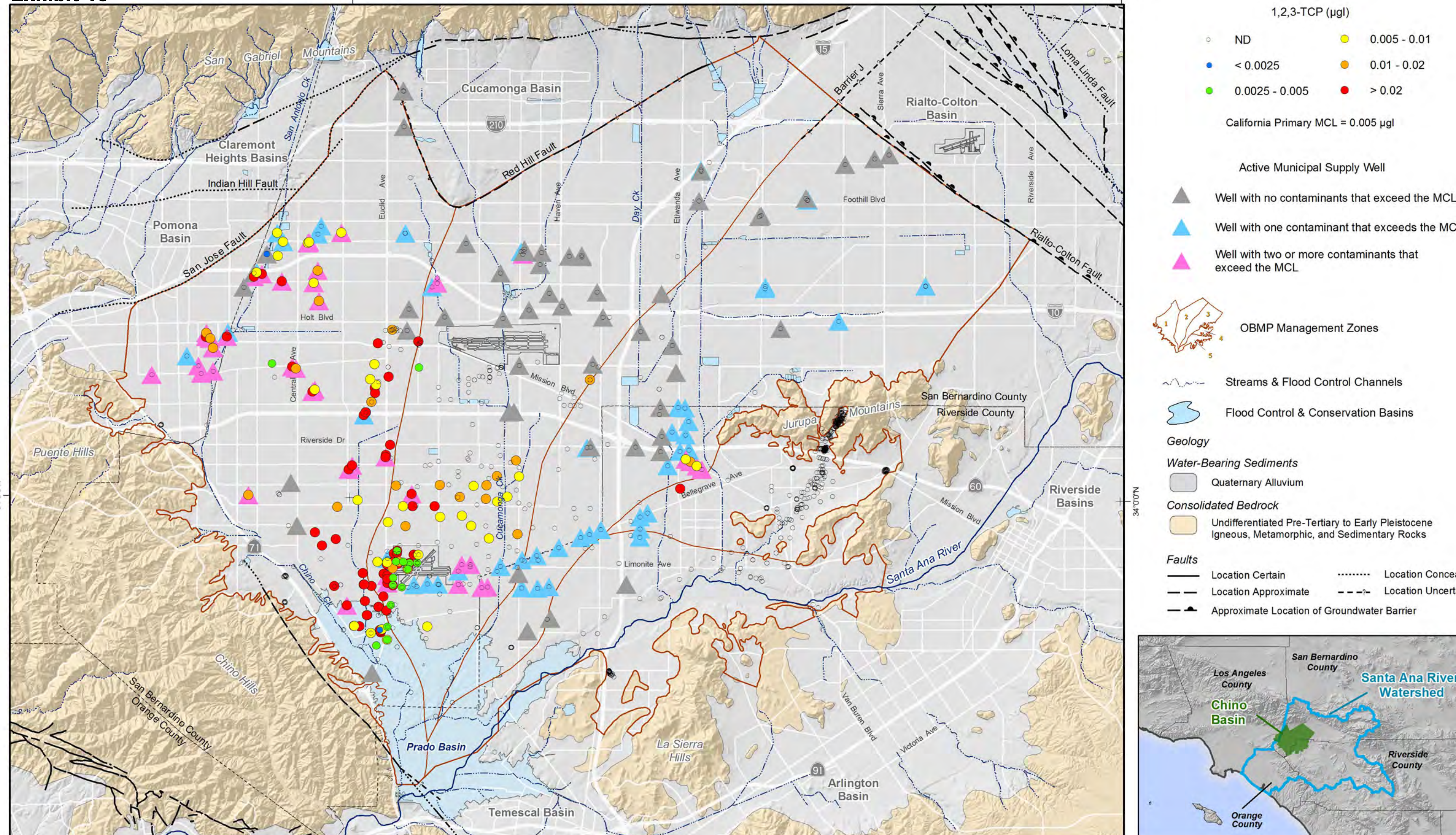
Prepared for:
OBMP 2020 Update
Scoping Report

Chino Basin Watermaster — Partners in Basin Management

Occurrence of Drinking Water Contaminants in Active Municipal Supply Wells in Chino Basin

2014-2018

Exhibit 19



1,2,3-TCP (μgl)

- ND
- < 0.0025
- 0.0025 - 0.005
- 0.005 - 0.01
- 0.01 - 0.02
- > 0.02

California Primary MCL = 0.005 μgl

Active Municipal Supply Well

- Well with no contaminants that exceed the MCL
- Well with one contaminant that exceeds the MCL
- Well with two or more contaminants that exceed the MCL

OBMP Management Zones

Streams & Flood Control Channels

Flood Control & Conservation Basins

Geology

Water-Bearing Sediments

Quaternary Alluvium

Consolidated Bedrock

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

Faults

- Location Certain
- Location Approximate
- Approximate Location of Groundwater Barrier
- Location Concealed
- Location Uncertain

Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: CS
Date: 12/16/2019
File: 19.) 1,2,3-TCP_2014-2018.mxd

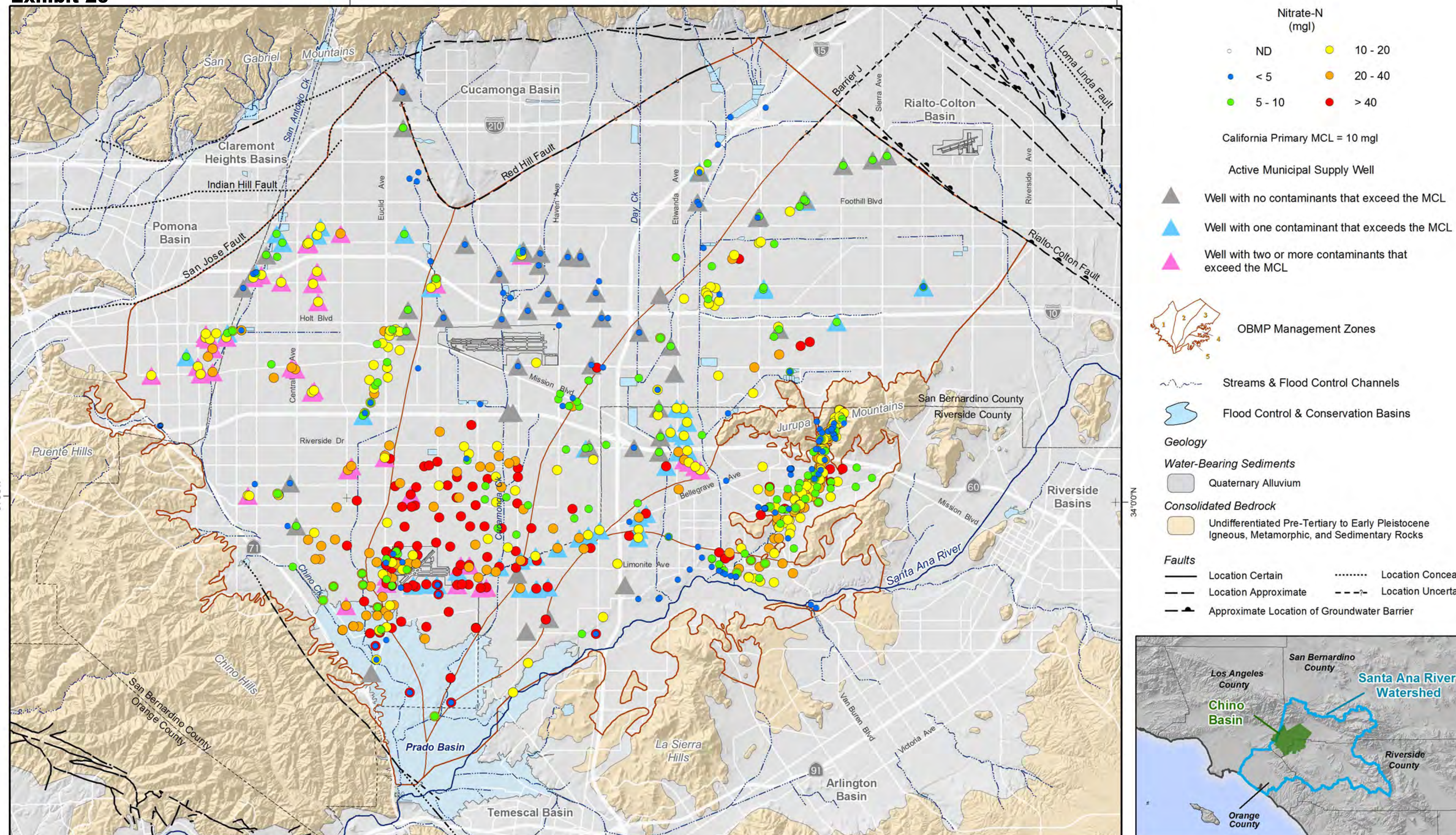
0 1 2 3 4 5 Miles
0 2 4 6 8 Km

Prepared for:
OBMP 2020 Update
Scoping Report

Maximum 1,2,3-Trichloropropane (1,2,3-TCP) Concentration
2014-2018

Exhibit EF-4

Exhibit 20



Prepared by:

WEI
WILDERMUTH ENVIRONMENTAL, INC.

Author: CS
Date: 12/16/2019
File: 20.) NO3_2014-2018.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

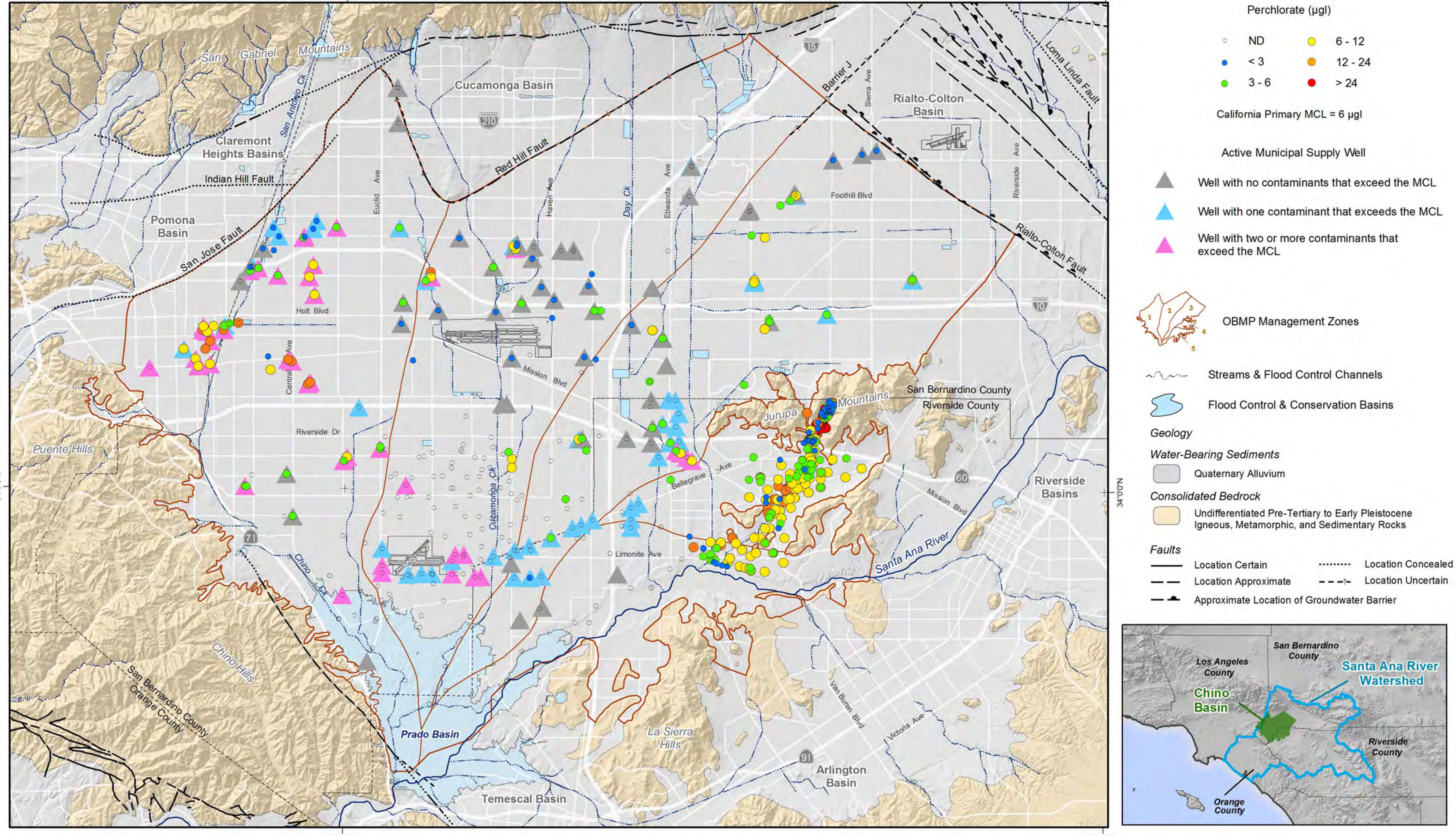
Prepared for:
OBMP 2020 Update
Scoping Report

CHINO BASIN WATERMASTER
Partners in Basin Management

Maximum Nitrate Concentration
2014-2018

Exhibit EF-3

Exhibit 21



Prepared by:

WEI WILDERMUTH ENVIRONMENTAL, INC.

Author: CS
Date: 12/16/2019
File: 21.) CLO4_MCL_2014-2018.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

Prepared for:

OBMP 2020 Update

Scoping Report

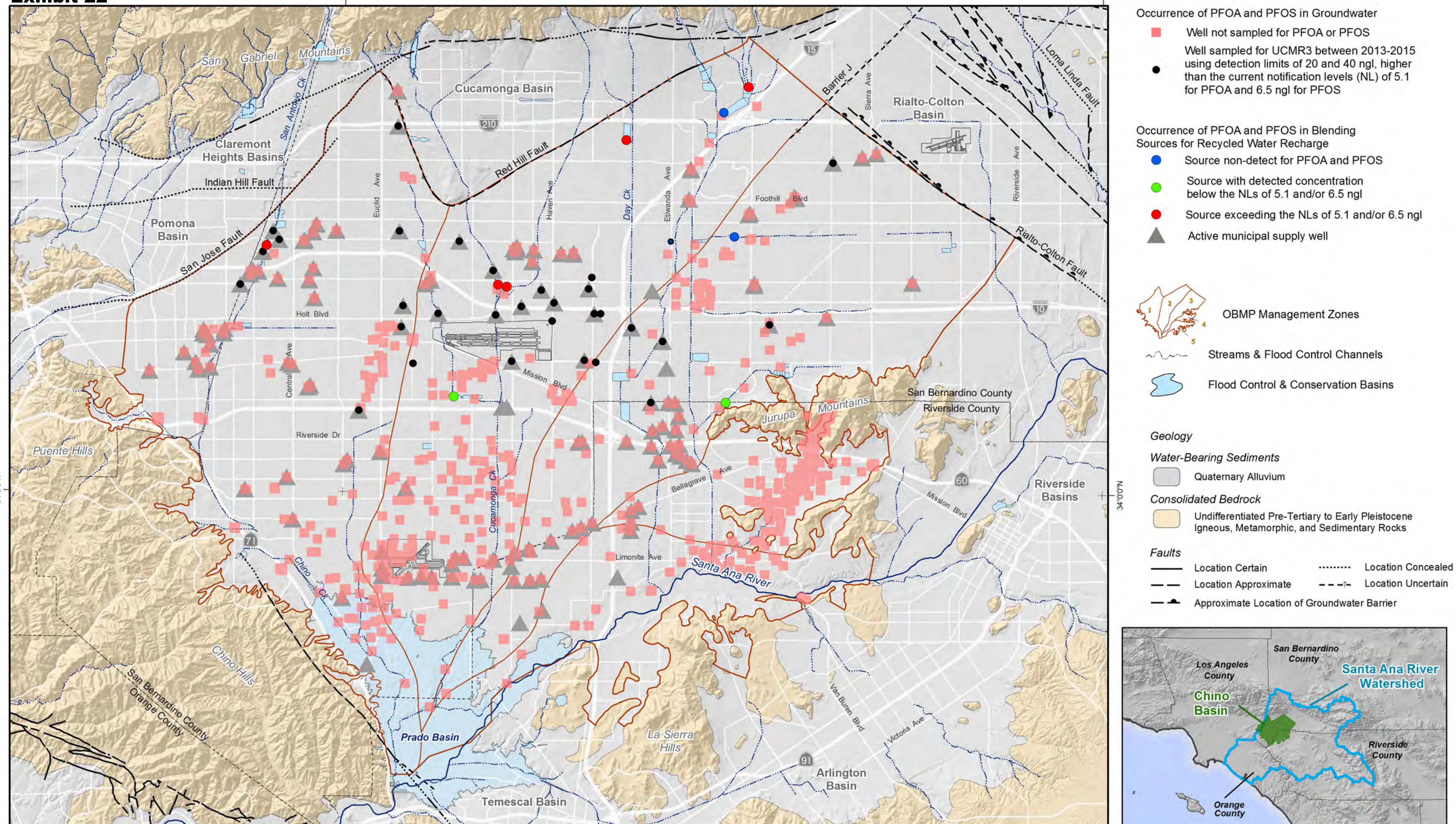
CHINO BASIN WATERMASTER Partners in Basin Management

Maximum Perchlorate Concentration

2014-2018

Exhibit EF-5

Exhibit 22



Prepared by:

WEI
WILDERMUTH ENVIRONMENTAL, INC.

Author: CS
Date: 12/18/2019
File: 22.) PFAS_1998-2019.mxd

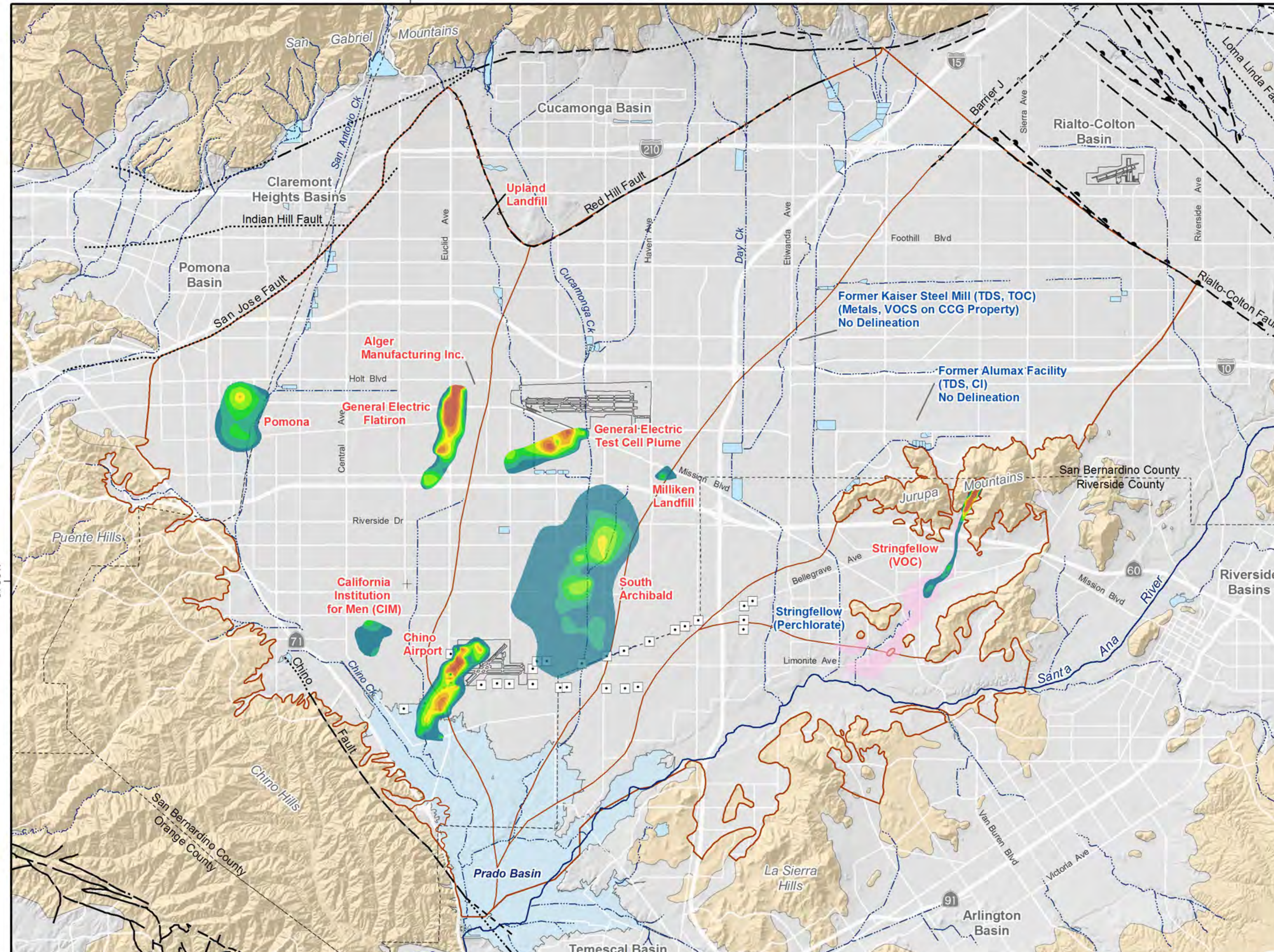
0 1 2 3 4 5 Miles
0 2 4 6 8 Km

Prepared for:
OBMP 2020 Update
Scoping Report

PFOA and PFOS Concentrations
Through March 2019

Exhibit EF-10

Exhibit 23



VOC Concentration (µgl)

- > 0 to ≤ 5
- > 5 to ≤ 10
- > 10 to ≤ 20
- > 20 to ≤ 50
- > 50 to ≤ 100
- > 100 to ≤ 200
- > 200 to ≤ 500
- > 500

The VOC plumes shown on this map are generalized illustrations of the estimated spatial extent of TCE or PCE, based on the maximum concentration measured at wells over the five-year period of July 2013 to June 2018. The VOC plume illustrations were created with the grid function in Golden Software's Surfer 16 using an ordinary kriging interpolation model with model input parameter estimation and optimization performed by semivariogram analysis in Golden Software's Surfer 16. Interpretations of the plume extent and boundary delineation were made based on measured concentrations and local groundwater flow patterns as predicted by the Chino Basin groundwater flow model.

VOC Plumes Labeled in Red by Name

Other Plumes - Labeled in Blue by Name and Dominant Contaminant

The plumes characterized by color ramp represent Watermaster's most recent characterization of the primary contaminant of concern. The spatial extent of the VOC contamination was delineated by Watermaster based on the five-year maximum concentrations of the primary contaminant of concern for the period of July 2013 to June 2018. The primary VOC contaminant of concern in all of the plumes is TCE with the exception of the CIM plume, which is PCE. The VOC plumes associated with the Upland Landfill and the Alger Manufacturing Facility are of limited geographical extent at the scale of this map, so only their general locations are identified.

Other point-source contamination plumes in the Chino Basin include the former Kaiser Steel Mill, the former Alumax Facility, and the Stringfellow NPL Site, which are labeled by name and the primary contaminants associated with the sites. The former Kaiser Steel Mill TDS and total organic carbon (TOC) plume has not been delineated since 2008 (WEI, 2008b), and there are no plume delineations for the contamination associated with the former Kaiser Steel Mill CCG Property for metals and VOCs or the former Alumax Facility for TDS and chloride (Cl). The Stringfellow perchlorate plume shown here was delineated in the most recent remediation evaluation report for the site (Kleinfelder, 2018).

Prepared by: WEI Wildermuth Environmental, Inc.

Author: LH
Date: 12/16/2019
File: 23.) Plumes_new_txt.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

Prepared for:
2018 State of the Basin Report
Groundwater Quality

Chino Basin Watermaster — Partners in Basin Management

Delineation of Groundwater Contamination
Plumes and Point Sources of Concern

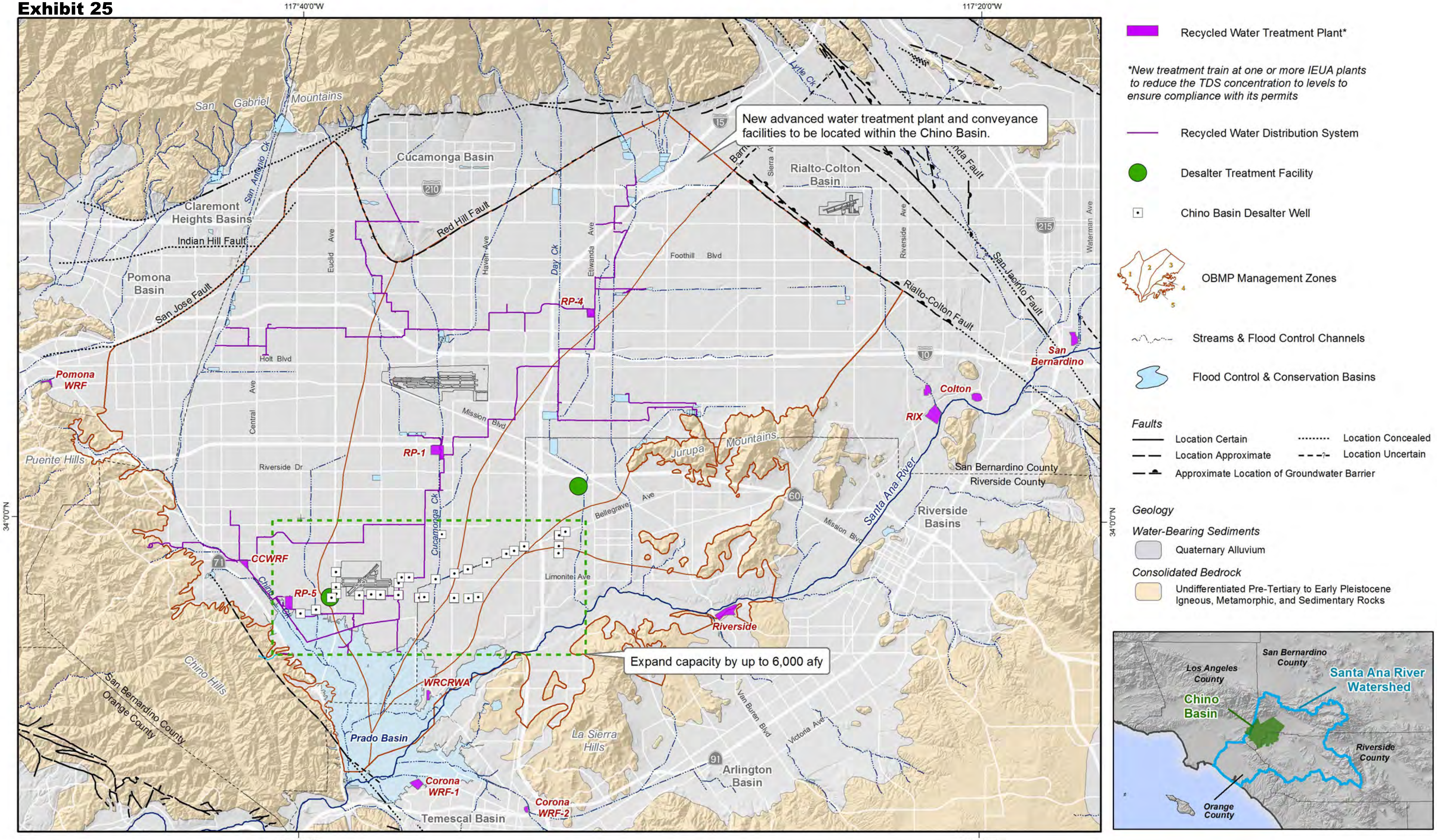
Exhibit 5-15

Exhibit 24

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 25



Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: SO
Date: 12/20/2019
File: 25.) Exhibit D-1_RW Treatment Plants.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

Prepared for:
OBMP 2020 Update
Scoping Report

Chino Basin Watermaster
Partners in Basin Management

Recycled Water Treatment Plants and Discharge Points

Exhibit D-1

Exhibit 26

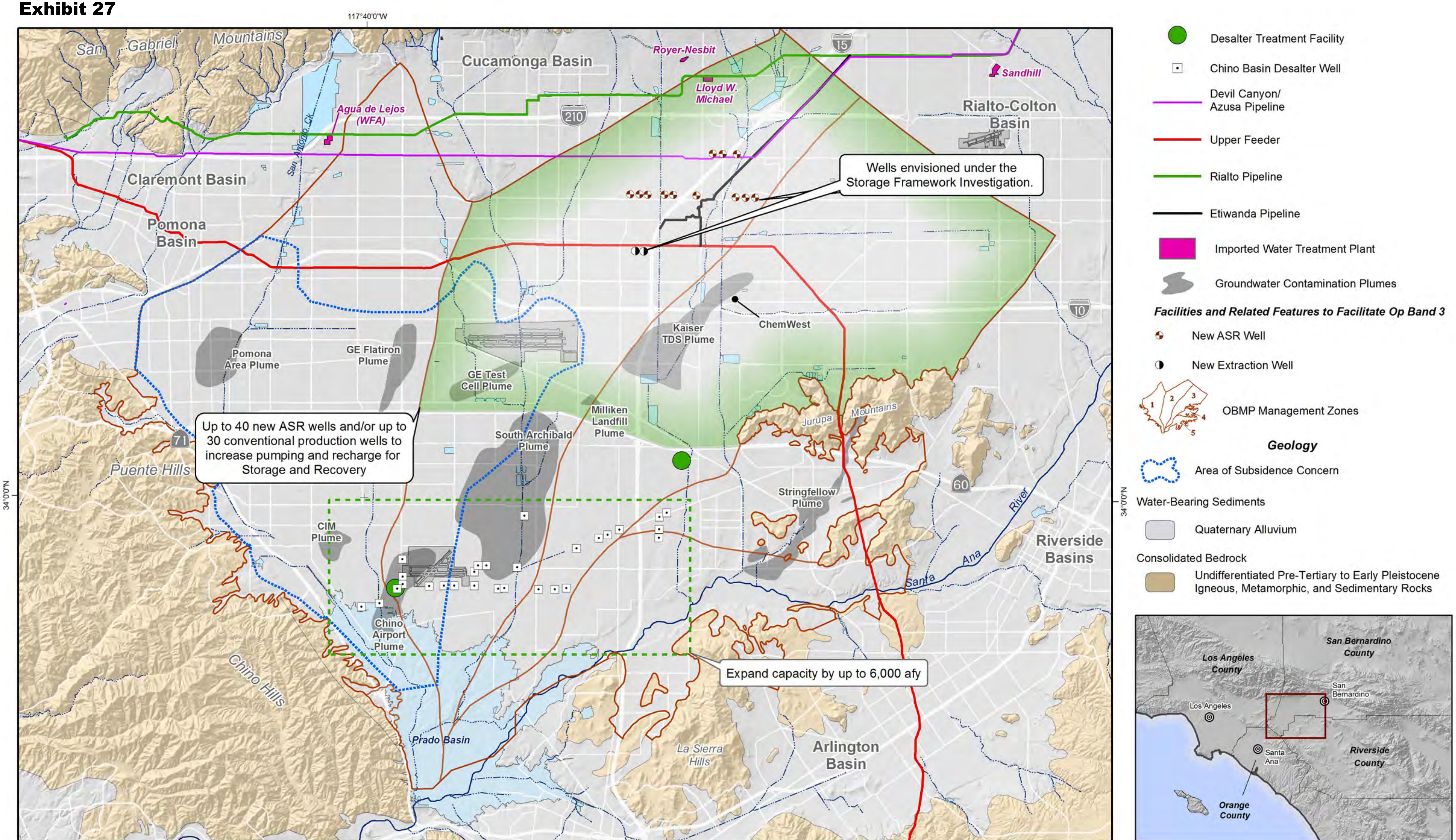
Exhibit 16

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.

Exhibit 27



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Siting of New ASR and Extraction Wells to Facilitate Storage and Recovery Programs in Op Band 3

Figure 6-2a