Final | November 2021

Technical Memorandum 5 – Part 2: Sustainability of Basin Optimization Scenarios

Groundwater Sustainability Plan for the Spadra Basin

PREPARED FOR

SPADRA BASIN
GROUNDWATER SUSTAINABILITY
AGENCY

PREPARED BY

WEST YOST
Water. Engineered.

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Spadra Basin Groundwater Sustainability Agency

Project No. 954-80-20-01

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LIST OF ACRONYMS AND ABBREVIATIONS

af	Acre-Feet
afy	Acre-Feet Per Year
CBWM	Chino Basin Watermaster
CPP	California State Polytechnic University, Pomona
DWR	California Department of Water Resources
ft	Feet
Ft-amsl	Feet Above Mean Sea Level
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
LA Basin Plan	Water Quality Control Plan, Los Angeles Region
LA Regional Board	California Regional Water Quality Control Board Los Angeles Region
LA Sanitation Districts	Sanitation Districts of Los Angeles County
Metropolitan	Metropolitan Water District of Southern California
mgd	Million Gallons per Day
Pomona	City of Pomona

RO	Reverse Osmosis
SNMP	Salt and Nutrient Management Plan
SGMA	Sustainable Groundwater Management Act
State Water Board	State Water Resources Control Board
SWP	State Water Project
TM	Technical Memorandum
TVMWD	Three Valleys Municipal Water District
WEI	Wildermuth Environmental Inc.
West Yost	West Yost Associates, Inc.
WRP	Water Reclamation Plant
WVWD	Walnut Valley Water District

Technical Memorandum 5 – Part 2: Sustainability of Basin Optimization Scenarios

INTRODUCTION

The Spadra Basin is a small, non-adjudicated subbasin of the San Gabriel Valley Basin (Basin 4-013 as defined by the California Department of Water Resources [DWR]). Pursuant to the Sustainable Groundwater Management Act of 2014 (SGMA), the DWR designated the San Gabriel Valley Basin as a "low-priority" basin. The San Gabriel Valley Basin is considered low-priority because groundwater rights in most of the basin have been adjudicated; and as such, the SGMA does not require that a Groundwater Sustainability Plan (GSP) be prepared for the basin.

Although it is not a requirement of the SGMA, the Walnut Valley Water District (WVWD) and the City of Pomona (Pomona) collectively formed a Groundwater Sustainability Agency (GSA) for the Spadra Basin (Spadra Basin GSA) and decided to prepare and adopt a GSP with the dual objectives of achieving long-term sustainability and maximizing the beneficial use of the Spadra Basin.

The Spadra Basin GSA contracted Wildermuth Environmental Inc. (WEI), since acquired by West Yost Associates (West Yost), to help prepare the GSP. The scope of work includes preparing five technical memoranda in sequence. Each technical memorandum (TM) constitutes an interim milestone in the development of the final GSP for the Spadra Basin. The five technical memoranda include:

- Technical Memorandum 1 (TM 1) – Conceptual Model of the Spadra Basin
- Technical Memorandum 2 (TM 2) – Construction and Calibration of the Spadra Basin Groundwater Model
- Technical Memorandum 3 (TM 3) – Sustainable Management Criteria for the Spadra Basin
- Technical Memorandum 4 (TM 4) – Sustainability of Future Baseline Conditions
- Technical Memorandum 5 (TM 5) – Basin Optimization Scenarios to Achieve Sustainability

TM 1 through TM 5 will ultimately become sections in the final GSP for the Spadra Basin and be used to help prepare the GSP implementation plan in the final GSP. The outline of the final GSP for the Spadra Basin and mapping to each TM is as follows:

- Executive Summary
- Section 1: Introduction
- Section 2: Plan Area and Basin Setting (TM 1, TM 2, and TM 4)
- Section 3: Sustainable Management Criteria (TM 3)
- Section 4: Monitoring Network
- Section 5: Projects and Management Actions to Achieve Sustainability (TM 5)
- Section 6: GSP Implementation
- Section 7: References

The evaluation of the Baseline Scenario in TM 4 indicated that groundwater levels are projected to decline by 20-25 feet in the Spadra Basin over the next 60 years. This decline in groundwater levels is predicted to exceed the Minimum Thresholds for groundwater levels, and by proxy groundwater storage and land subsidence, and therefore is expected to cause Undesirable Results. The primary cause of these projected

declines in groundwater levels is an increase in groundwater pumping in the Baseline Scenario by 526 afy from the long-term average pumping in the Basin. The conclusion of TM 4 was that projects and programs are needed to support groundwater levels to avoid undesirable results, achieve long-term sustainability, and maximize the beneficial use of the Basin.

The objective of TM 5 is to describe the process and outcomes of identifying a preferred combination of projects and management plans to achieve long-term sustainability in the Spadra Basin and maximize its beneficial use.

The methods employed to achieve this objective are:

(i) With the Spadra Basin stakeholders, develop concepts for projects and management plans and describe them as "Basin Optimization Scenarios."

(ii) Evaluate the hydrologic response of the Spadra Basin to the Basin Optimization Scenarios over a 60-year planning horizon using the Spadra Basin groundwater model. Groundwater modeling will be the method to quantitatively evaluate and determine sustainability for each Basin Optimization Scenario based on the Sustainability Indicators for groundwater levels, and by proxy groundwater storage and land subsidence.

(iii) Compare the hydrologic response of the Spadra Basin for the Basin Optimization Scenarios to each other, and to the Baseline Scenario.

(iv) Prepare a cost analyses for the Basin Optimization Scenarios and compare the costs to each other and to the Baseline Scenario.

(v) Recommend a preferred Basin Optimization Scenario.

The contents in TM 5 will be become the contents for Section 5 of the GSP – *Projects and Management Actions to Achieve Sustainability*.

Draft TM 5 – Part 1 was prepared in June 2021 to describe the results of item (i) above. Appendix A includes the comments and responses to comments on the Draft TM5 – Part 1 and a Final TM 5 – Part 1 was completed in July 2021. Draft TM 5 – Part 2 was prepared in September 2021 to describe the results of items (ii) through (v). Appendix D includes the comments and responses to comments on the Draft TM5 – Part 2.

DEVELOPMENT OF THE BASIN OPTIMIZATION SCENARIOS

This section describes the accumulation of data and information from Spadra Basin stakeholders on potential projects and management actions in the Spadra Basin, and the combination of some of these projects and management actions into Basin Optimization Scenarios that are intended to achieve long-term sustainability and maximize the beneficial use of the Spadra Basin.

Potential Projects and Management Plan Concepts

The GSA conducted a call for projects from all Spadra Basin stakeholders via email in January 2021. Feedback on potential projects and management actions was received from California State Polytechnic University, Pomona (CPP), WVWD, City of Pomona (Pomona), and Forest Lawn Memorial Parks. This

feedback was compiled and presented at a Spadra Basin Advisory Committee meeting on February 25, 2021 for discussion amongst the stakeholders and to solicit additional feedback. Table 2-1 lists the various projects and plans with stakeholder attribution. Figure 2-1 is a map that shows the locations of the projects in the Spadra Basin.

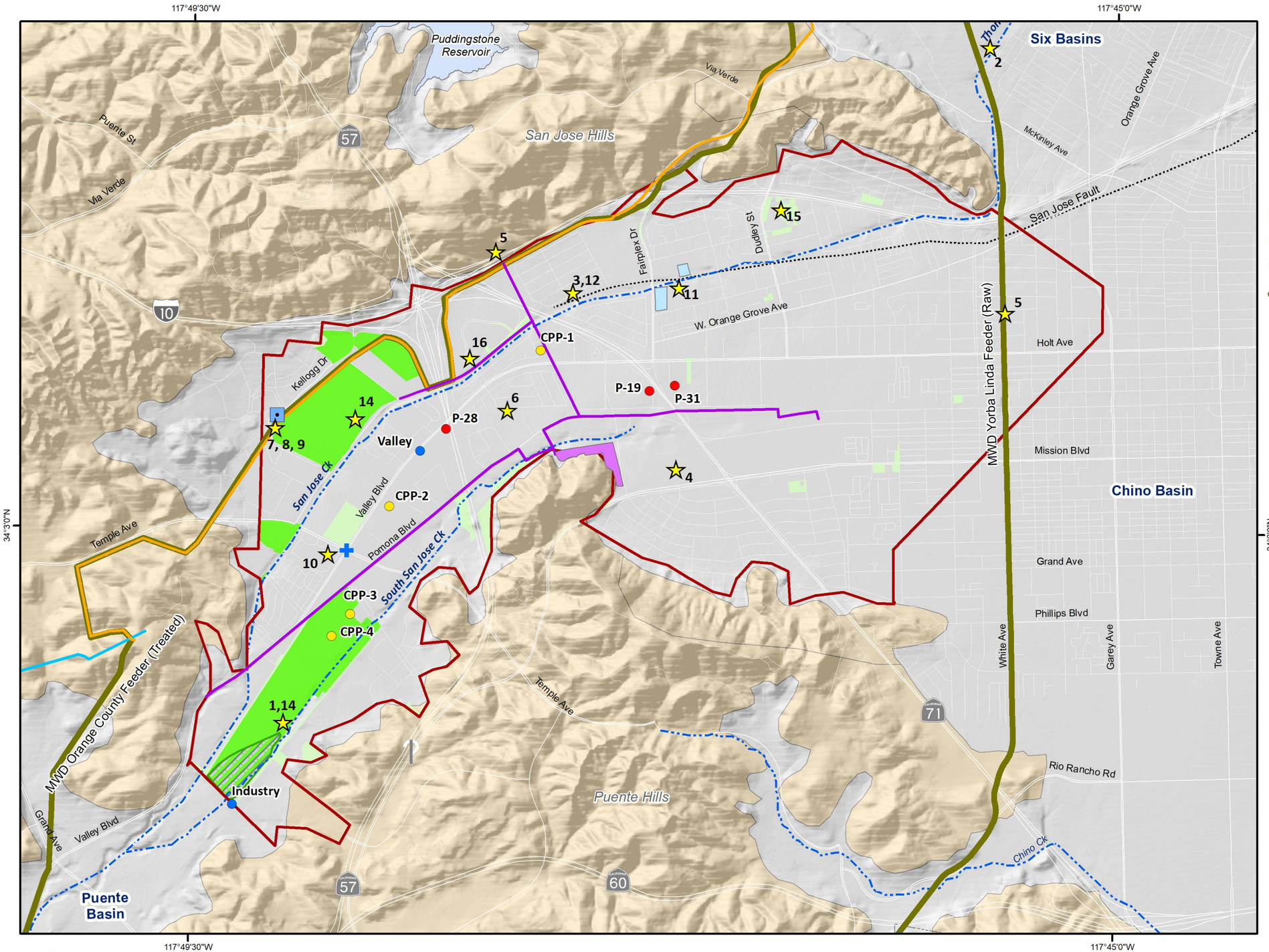
The primary project concepts of interest to the stakeholders were: artificial recharge projects that will support groundwater levels and augment the yield of the basin; the use of surplus recycled water from the Pomona WRP that otherwise is discharged to South San Jose Creek and exits the Spadra Basin; and groundwater treatment projects to increase the potable use of the Spadra Basin. These project concepts and other feedback were used to develop three Basin Optimization Scenarios, described below.

Table 2-1. Proposed Projects and Management Actions for the Spadra Basin

Map ID	Project Description	Proposing Agency
Recharge Projects		
1	Convert CPP agricultural land at the confluence of San Jose Creek and South San Jose Creek into spreading grounds	CPP, Pomona
2	Develop a spreading connection off of the MWD Foothill Feeder - Rialto Pipeline at Thompson Creek Channel	CPP, WVWD
3	Redirect storm water flows in the area to new spreading grounds	CPP, Forest Lawn
4	Recharge surplus recycled water from the Pomona WRP after contractual obligations are met, via spreading or injection	CPP, Pomona, Forest Lawn, WVWD
5	Utilize three large diameter pipelines for imported water that run through the Spadra Basin as sources for artificial recharge; 1) The MWD's Orange County Feeder treated water pipeline, 2) The Pomona Walnut Rowland Joint Water Line (JWL) treated water pipeline, and 3) The MWD's Yorba Linda Feeder raw water pipeline.	WVWD
11	Selecting recharge locations where there is easy connection to different types of recharge waters (storm water, recycled water, and imported water) - Example shown in map for Map ID 11	Feb 2021 Advisory Committee Meeting
12	Construction of rubber dams in the San Jose Creek to divert storm water for recharge;	Feb 2021 Advisory Committee Meeting
13	Construction of underground infiltration galleries under sports fields at John Marshall Middle School or other schools/parks for recharge of recycled water and other waters	Feb 2021 Advisory Committee Meeting
14	Recharge storm water and recycled water through flood irrigation at Cal Poly Pomona agricultural lands when land is fallow	Feb 2021 Advisory Committee Meeting
15	Potential recharge location south east of the intersection of the 10 Freeway and Dudley Street.	Feb 2021 Advisory Committee Meeting

Table 2-1. Proposed Projects and Management Actions for the Spadra Basin

Map ID	Project Description	Proposing Agency
16	Potential recharge location at University Corporate Center Drive, however previous studies have indicated that the soil is potentially not conducive for recharge	Feb 2021 Advisory Committee Meeting
Pump and/or Treatment Projects		
6	Construct a new production well	CPP
7	Connect all wells to the Reverse Osmosis Plant	CPP
8	Operate Reverse Osmosis Plant at maximum capacity 24/7 with surplus potable water going to Pomona, Walnut and Rowland	CPP, Pomona, WVWD
9	Expand treatment capacity at the CPP Reverse Osmosis Plant	CPP, Forest Lawn
10	Utilizing an existing intertie at the intersection of Temple and Valley between WVWD and the City of Pomona, to facilitate use of Spadra Basin water by WVWD by leveraging Pomona's existing pumping capacity in the basin.	WVWD
Management Strategies		
	Replace recycled water going to Forest Lawn with groundwater	CPP
	Conjunctive Water Management to maximize the use of all water resources available to the parties, including storm, recycled, imported, and groundwaters, and the storage capacity of the groundwater basin.	Forest Lawn
	Maximize recharge and pumping to assist in groundwater cleanup and characterize impacts to neighboring basins	Forest Lawn
	Increase reliability of irrigation water with an increase in the use of recycled water	Forest Lawn
	Inventory all existing and adjacent (public and private) water facilities to optimize the basin	Forest Lawn
	Leverage existing infrastructure to move surplus water around between parties	WVWD
	Increase and maximize groundwater pumping with increased artificial recharge	Forest Lawn, WVWD
	Implementing treatment and leveraging cleanup of point sources in the basin	Feb 2021 Advisory Committee Meeting
	Design a management plan to optimally manage and use the basin for local reliable sources without a storage a recovery program	Feb 2021 Advisory Committee Meeting
	Implement recharge programs with a steady and reliable source of water with matched increased pumping.	Feb 2021 Advisory Committee Meeting



4 Location of Proposed Project (labeled by ID in Table 2-1)

Existing Facilities

Existing Production Wells (Symbolized by Well Owner)

- Cal Poly Pomona (CPP)
- City of Pomona (Pomona)
- Walnut Valley Water District (WVWD)

Imported Water Pipelines

- Pomona Walnut Rowland (PWR) Joint Feeder (Treated)
- Badillo Grand Pipeline, Treated
- MWD Orange County Feeder (Treated), and Yorba Linda Feeder (Raw)

- Pomona Water Reclamation Plant (WRP)
- Pomona WRP Recycled Water Pipelines
- CPP Reverse Osmosis (RO) Plant
- Intertie between WVWD and Pomona

Other

- CPP Agricultural Lands
- Agricultural Land at Confluence of San Jose and South San Jose Creeks
- Vacant Land
- Streams & Flood Control Channels
- Spadra Basin (GSP Boundary)

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Date: 9/22/2021
File: Figure 2-1 projects.mxd

0 0.5 1 1.5 Miles
0 0.5 1 1.5 2 Kilometers

Prepared for:
Spadra Basin Groundwater Sustainability Agency
Groundwater Sustainability Plan
SPADRA BASIN GROUNDWATER SUSTAINABILITY AGENCY

Map of Proposed Locations for New Projects for the Spadra Basin

Figure 2-1

Basin Optimization Scenarios

Three Basin Optimization Scenarios have been developed over the 60-year planning period: Basin Optimization Scenario 1 – Sustainability through Substitution; Basin Optimization Scenario 2 – Sustainability through Recharge; and Basin Optimization Scenario 3 – Maximum Beneficial Use. All three scenarios are intended to achieve long-term sustainability in the Basin, and Basin Optimization Scenario 3 is intended to maximize its beneficial use. The scenarios will be evaluated using the Spadra Basin groundwater model for the same 60-year planning period of 2019-2079 that was used to evaluate the Baseline Scenario. The hydrologic response of the Spadra Basin to the Basin Optimization Scenarios will be compared to the Sustainable Management Criteria set in the Spadra Basin for groundwater levels, and by proxy groundwater storage and land subsidence. Additionally, cost estimates will be prepared for each Basin Optimization Scenario and compared to each other and the cost of the Baseline Scenario.

The primary cause of the projected decline in groundwater levels in the Baseline Scenario is an increase in projected groundwater pumping by 526 acre-feet per year (afy) from the long-term average pumping for the 1978 to 2018 historical period. This observation was used to set the assumption that about 500 afy of recharge or decreased pumping is needed to support groundwater levels and achieve long-term sustainability in the Spadra Basin for the Basin Optimization Scenarios.

All three Basin Optimization Scenarios include the use of surplus recycled water from the Pomona WRP to achieve the objectives of the scenarios. Surplus recycled water is tertiary-treated effluent from the Pomona WRP that is not delivered for direct reuse to existing customers in the Spadra Basin for irrigation or commercial purposes.

Currently, this surplus recycled water is discharged to the South San Jose Creek where it exits the Spadra Basin and either evaporates, is recharged about 15 miles downstream at the Montebello Forebay, or is consumed by riparian vegetation at the Montebello Forebay. The surplus recycled water from the Pomona WRP is about 3.3 million gallons per day (mgd) or about 3,500 afy. The Sanitation Districts of Los Angeles County (LA Sanitation Districts) filed for a wastewater change petition (WW 0104) with the State of California Water Resources Control Board (State Water Board) in October 2019 to reduce the discharge of treated recycled water to the South San Jose Creek from the Pomona WRP to zero for all months of the year (State Water Board, 2019) and be redirected for other uses. This change petition was approved in October 2020 allowing for the potential utilization of this surplus recycled water in the Spadra Basin (State Water Board and California Environmental Protection Agency [EPA] 2020).

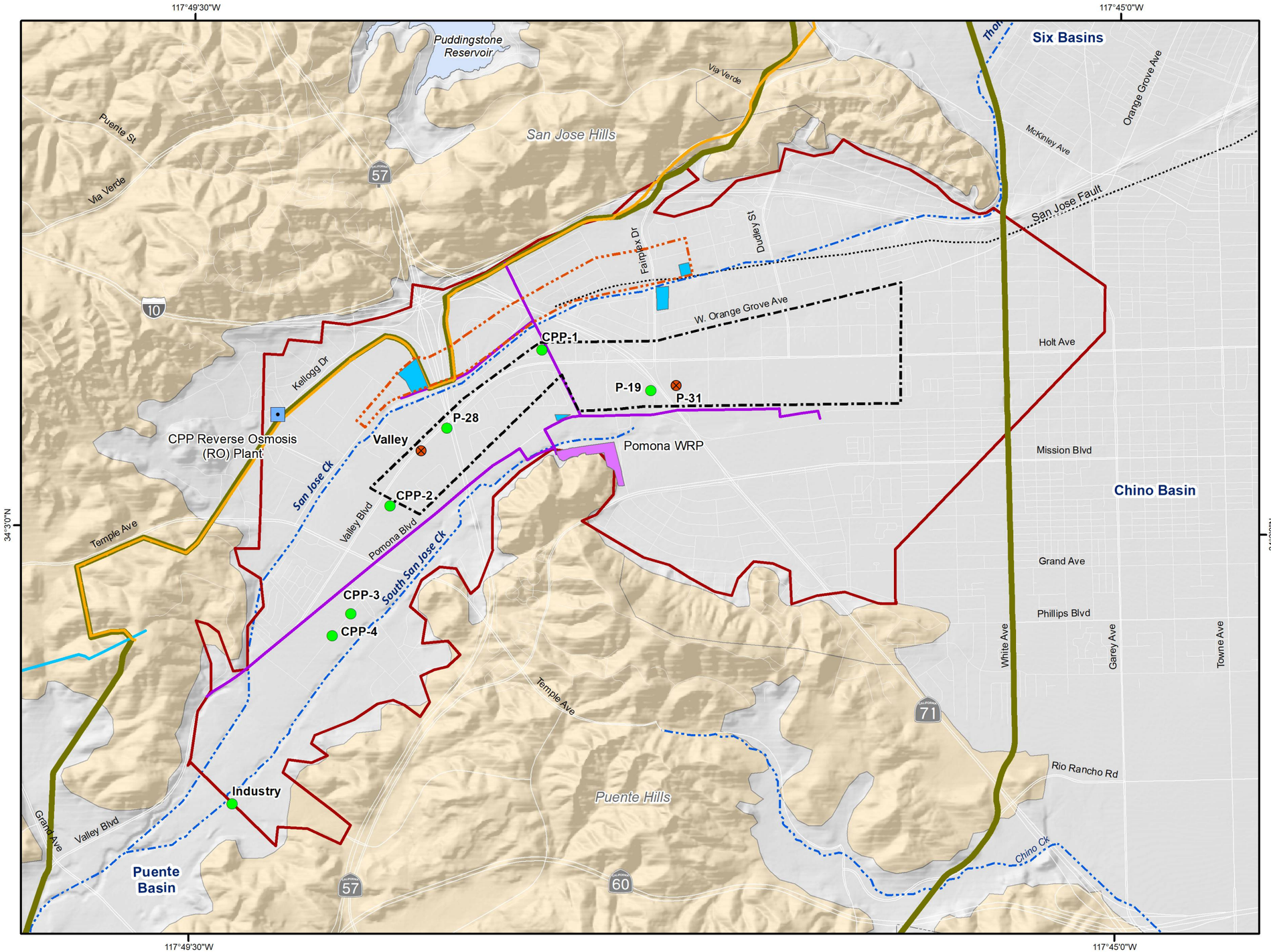
The LA Sanitation Districts completed a final Environmental Impact Report (FEIR) for the reduced discharge to the San Gabriel River Watershed envisioned in the wastewater change petition for the Pomona WRP and three other treatment plants in the watershed (ESA, 2019). The FEIR includes a mitigation measure for the LA Sanitation Districts to implement an Adaptive Monitoring Plan (AMP) in coordination with the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Wildlife (CDFW) to ensure the quantity and quality of the riparian and wetland habitat downstream is maintained during reduced flow from the upstream treatment plants. A draft AMP was developed and included as an attachment to the FEIR (Wood, 2019) and includes the monitoring of various vegetation parameters and trigger levels to implement responsive measures that could include resumed discharges to the river and tributary channels in sufficient volumes to support the habit sustained by historical discharges. If the final GSP includes the projects that utilize the surplus recycled water from the Pomona WRP, a contingency plan to address the uncertainty of the future availability of all or part of the surplus recycled water will be developed during the planning phases of the projects and management actions

during GSP implementation.[1] The contingency plan will include a description of the options for alternative water sources for recharge and projects and management strategies if the surplus recycled water is no longer available.

Recycled water is considered the primary source of recharge for the Basin Optimization Scenarios 2 & 3 because of the stakeholder interest to utilize this local available source of water that is currently not being used in the Spadra Basin. Basin Optimization Scenarios 2 & 3 contemplate the use of recycled water for artificial recharge ranging from 500 afy to 3,500 afy at locations that are conceptual at this time. However, it is also possible that imported water, storm water, dry weather flow, or a combination of waters could be recharged at some of the potential locations

Each Basin Optimization Scenario is summarized below. Figure 2-2 is a map of the Spadra Basin that shows the locations of all existing wells, potential new wells, and potential new recharge facilities included in the three Basin Optimization Scenarios.

[1] The final GSP will include a description of how the projects will be taken from the concepts described in the GSP to final design and then through construction in a phased approach of implementation.



Exsisting Wells

- Well Planned to be Active in Baseline Scenario
- Well Planned to be Inactive in Baseline Scenario

Exsisting Facilities

- Pomona WRP Recycled Water Pipelines
- Pomona Water Reclamation Plant (WRP)
- CPP Reverse Osmosis (RO) Plant

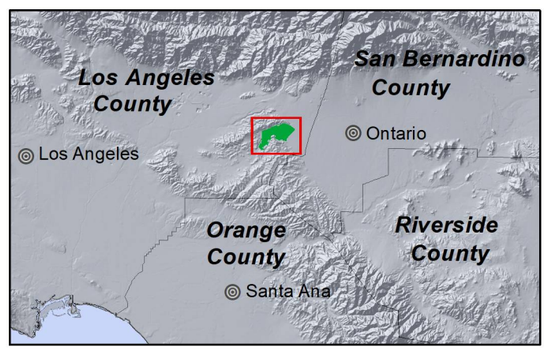
Imported Water Pipelines

- Pomona Walnut Rowland (PWR) Joint Feeder (Treated)
- Badillo Grand Pipeline (Treated)
- MWD Orange County Feeder (Treated), and Yorba Linda Feeder (Raw)

New Wells and Facilities

- Potential Location for Underground Recharge Gallery
- Target Area for New Injection Wells
- Target Area for New Production Wells

- Streams & Flood Control Channels
- Spadra Basin (GSP Boundary)



Prepared by:

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Date: 9/22/2021
File: Figure 2-2_BOS_Wells_Facilities_New.mxd

0 0.5 1 1.5 Miles
0 0.5 1 1.5 2 Kilometers

Prepared for:

Spadra Basin Groundwater Sustainability Agency
Groundwater Sustainability Plan

SPADRA BASIN GROUNDWATER SUSTAINABILITY AGENCY

Map of Potential Locations for New Wells and Facilities for Basin Optimization Scenarios

Figure 2-2

Basin Optimization Scenario 1 – Sustainability through Substitution

Objective. Support groundwater levels and achieve sustainability in the Spadra Basin by decreasing groundwater pumping.

Description. Scenario 1 eliminates groundwater pumping at Cal Poly wells CPP-2, CPP-3, and CPP-4 (wells currently used for non-potable supply for irrigation) and replaces it with surplus tertiary-treated recycled water from the Pomona WRP. The combined planned pumping in the Baseline Scenario for CPP-2, CPP-3, and CPP-3 is 430 afy. Therefore, the 430 afy of groundwater supply will be replaced with 430 afy of recycled water from the Pomona WRP. This substitution is viable because the monthly surplus recycled water is greater than the monthly planned pumping at the CPP-2, CPP-3, and CPP-4 wells combined, even during the peak demand months in the summer. Additionally, the sites that are irrigated with groundwater pumped from these CPP wells are near the main recycled water pipelines where turnouts and extensions could be added for irrigation at these sites.

Permitting: Already permitted under existing WRRs for LACSD Order No. 97-072, and potentially the development of a salt and nutrient management plan (SNMP) for the Spadra Basin, or inclusion of the Spadra Basin in the San Gabriel Valley Basin SNMP (Stetson Engineers Inc., 2016).

Groundwater Pumping. In Scenario 1, a total of 1,376 afy is pumped from wells CPP-1, P-28, P-19, and Industry. This is 430 afy less than groundwater pumping in the Baseline Scenario.

Managed Aquifer Recharge. There is no artificial recharge included in Scenario 1.

Treatment. There is no additional groundwater treatment included in Scenario 1.

New Wells/Facilities. Additional recycled water pipeline and connections will be necessary to enable irrigation with recycled water at the sites currently irrigated with groundwater.

Basin Optimization Scenario 2 – Sustainability through Recharge

Objective. Support groundwater levels and achieve sustainability in the Spadra Basin via managed aquifer recharge of recycled water from Pomona WRP.

Description. Scenario 2 increases artificial recharge to the Spadra Basin from 0 afy to 500 afy via the construction of new recharge facilities for the recharge of recycled water from the Pomona WRP. Two different types of recharge facilities will be constructed for the recharge of 500 afy: an underground recharge gallery with an estimated capacity of 200 - 890 afy (dependent on the selected site's surface area) and an injection well with an estimated recharge capacity of 450 afy. The two types of recharge facilities provide for operational flexibility and reliability, and the option to increase recharge above 500 afy. The two recharge facilities can also act as a pilot program to test the functionality and success of the two types of facilities.

Permitting: The recharge of recycled water will require permitting from the California Regional Water Quality Control Board Los Angeles Regional (LA Regional Board) with oversight from the State Water Resources Control Board (State Water Board), and potentially the development of a salt and nutrient management plan (SNMP) for the Spadra Basin, or inclusion of the Spadra Basin in the San Gabriel Valley Basin SNMP (Stetson Engineers Inc., 2016).

Groundwater Pumping. In Scenario 2, a total of 1,806 afy is pumped from wells CPP-1, CPP-2, CPP-3, CPP-4, P-28, P-19, and Industry. This is equal to the planned pumping in the Baseline Scenario.

Managed Aquifer Recharge. In Scenario 2, a total of 500 afy of recycled water is artificially recharged in the Spadra Basin, an increase of 500 afy compared to the Baseline Scenario.

Treatment. There is no additional groundwater treatment included in Scenario 2.

New Wells/Facilities.

- One underground recharge gallery and associated recycled water pipeline. Figure 2-2 shows potential locations for an underground recharge gallery. These locations were identified because they are along and/or near the main Pomona WRP recycled water pipeline in the northern central portion of the Basin and not near existing production wells. The potential locations to the east of Highway 71 will require the construction of new recycled water pipeline, but this new pipeline could be utilized to irrigate the schools and parks in this area and to supply recharge to any new injection wells in this area.
- One injection well and associated recycled water pipeline and connections. The location of the injection well will be within the target area shown in Figure 2-2. This target area was identified as an area along and/or near the main Pomona WRP recycled water pipeline and not nearby or upgradient from existing production wells.

Basin Optimization Scenario 3 – Maximum Beneficial Use

Objective. Support groundwater levels, achieve sustainability, and maximize the beneficial use of the Spadra Basin by utilizing all available surplus recycled water from the Pomona WRP for artificial recharge, increasing groundwater production, and increasing groundwater treatment capacity to produce a new potable water supply from the Spadra Basin.

Description. Scenario 3 increases artificial recharge to the Spadra Basin from 0 afy to 3,500 afy via the construction of new recharge facilities for the recharge of recycled water from the Pomona WRP. Two different types of recharge facilities will be constructed for the recharge of 3,500 afy: one underground recharge gallery with an estimated capacity of 200 - 890 afy (dependent on the selected site's surface area) and seven injection wells with a combined recharge capacity of 3,150 afy. The two types of recharge facilities provide for operational flexibility and reliability.
The increase in recharge will be accompanied by an increase in pumping of 3,000 afy to recapture recharge over the 500 afy needed to achieve sustainability. This increase in production will be achieved by increasing production at wells P-19, P-28, and CPP-1 to 90 percent of the design capacity, and the construction and operation of five new production wells with an average pumping capacity of 525 afy each. Two inactive wells (Walnut and P-31) could be rehabilitated to help achieve the increase in pumping instead of constructing some of the new production wells.

Scenario 3 also includes expanding the Reverse Osmosis (RO) Plant owned and operated by CPP to increase the potable use of Spadra Basin groundwater. Currently, the RO Plant treats groundwater pumped from well CPP-1 with a design influent capacity of 538 afy. Scenario 3 assumes 4,304 afy of groundwater pumped from wells CPP-1, P-28, P-19, and five new production wells will be conveyed to an expanded RO Plant for treatment with an influent capacity of about 4,400 afy.

Permitting. Like Scenario2, the recharge of recycled water in Scenario 3 will require permitting from the LA Regional Board with oversight from the State Water Board, and potentially the development of a SNMP for the Spadra Basin, or inclusion of the Spadra Basin in the San Gabriel Valley Basin SNMP (Stetson Engineers Inc., 2016). Scenario 3 will also require a permit from the State Water Board DDW for water treatment.

Groundwater Pumping. In Scenario 3, a total of 4,864 afy is pumped from wells CPP-1, CPP-2, CPP-3, CPP-4, P-28, P-19, Industry, and five new production wells. This is an increase of about 3,000 afy from the planned pumping in the Baseline Scenario.

Managed Aquifer Recharge. In Scenario 3, a total of 3,500 afy of recycled water is artificially recharged in the Spadra Basin, an increase of 3,500 afy compared to the Baseline Scenario.

Treatment. In Scenario 3, the CPP RO Plant influent capacity is expanded from 538 afy to 4,300 afy for potable supply for the Spadra Basin water purveyors.

New Wells/Facilities.

- One underground recharge gallery and associated recycled water pipeline. Figure 2-2 shows potential locations for an underground recharge gallery. These locations were identified because they are along and/or near the main Pomona WRP recycled water pipeline and not near existing production wells. The potential locations to the east of Highway 71 will require the construction of new recycled water pipeline, but this new pipeline could be utilized to irrigate the schools and parks in this area and to supply recharge to any new injection wells in this area.

- Seven injection wells and associated recycled water pipeline**.** The location of the injection wells will be within the target area shown in Figure 2-2. This target area was identified as an area along and/or near the main Pomona WRP recycled water pipeline and not nearby or upgradient from existing production wells and the proposed target area for new production wells.
- Five new production wells and conveyance pipelines to the RO Plant. The location of the wells will be in the target area shown in Figure 2-2. This target area was identified because it is the along the central axis and deepest portion of the basin. The inactive wells (Valley and P-31) could be put back into use and conveyed to CPP RO Plant in lieu of constructing two of the new production wells.
- Expansion of the treatment capacity at the CPP RO Plant and conveyance pipelines to and from the RO plant.

The table below summarizes the Baseline and Basin Optimization Scenarios.

Table 2-2. Summary of Basin Optimization Scenarios vs. Baseline Scenario, afy

	Pumping	Pumping from Baseline	Recharge	Recharge from Baseline	New Facilities
Baseline	1,806	—	0	—	—
Scenario 1	1,376	-430	0	0	• Additional recycled water pipeline and connections
Scenario 2	1,806	0	500	500	• Underground recharge gallery and pipeline • Injection well and pipeline
Scenario 3	4,800	2,994	3,500	3,500	• Underground recharge gallery and pipeline • Seven Injection wells and pipeline • Five production wells and pipeline • Expansion of CPP RO Plant and pipeline

EVALUATION OF THE BASIN OPTIMIZATION SCENARIOS

The objective of this section is to describe the predicted hydrologic responses of the three Basin Optimization Scenarios described in Section 2.2 over the 60-year planning period of 2019 to 2079. The hydrologic responses were predicted with the Spadra Basin groundwater model and are compared against each other and the hydrologic response of the Baseline Scenario.

Figures 3-1a, 3-1b, and 3-1c show the locations of the existing and planned facilities that are included in Basin Optimization Scenarios 1, 2, and 3, respectively. Table 3-1 summarizes the facilities and operations for the Basin Optimization Scenarios. Tables 3-2a, 3-2b, 3-2c are the model-estimated annual water budgets of the Spadra Basin for the three Basin Optimization Scenarios over the planning period of 2019-2079.

The hydrologic responses are described in the sub-sections below, including groundwater levels, comparison of the groundwater levels to sustainability metrics set in TM 3, pumping sustainability, change in storage, subsurface outflow to the Chino and Puente Basins, and sustainable yield.

Table 3-1. Summary of Operational Assumptions for the Basin Optimization Scenarios and Facilities, afy

Facility	Capacity	Volume Assumed in Scenario			
		Baseline	Scenario 1	Scenario 2	Scenario 3
Assumed Start-up Year for Planned Facilities:			FY 2027	FY 2027	FY 2030
Pumping					
P-19	646	295	295	295	581
P-28	565	550	550	550	550
Industry Well	210	105	105	105	105
CPP-1	662	426	426	426	430
CPP-2	525	200	—	200	200
CPP-3	404	10	—	10	10
CPP-4	807	220	—	220	220
New Well 1	602	—	—	—	542
New Well 2	602	—	—	—	542
New Well 3	602	—	—	—	542
New Well 4	602	—	—	—	542
New Well 5	602	—	—	—	542
Total	**6,829**	**1,806**	**1,376**	**1,806**	**4,806**
Direct Reuse of Recycled Water					
Total for all Agencies	--	5,200	5,630	5,200	5,200
Artificial Recharge					
Underground Recharge Gallery	410	—	—	250	350
Injection Well 1	450 [(a)]	—	—	250	450
Injection Well 2	450	—	—	—	450
Injection Well 3	450	—	—	—	450
Injection Well 4	450	—	—	—	450
Injection Well 5	450	—	—	—	450
Injection Well 6	450	—	—	—	450
Injection Well 7	450	—	—	—	450
Total	**3,560**	**0**	**0**	**500**	**3,500**

Table 3-1. Summary of Operational Assumptions for the Basin Optimization Scenarios and Facilities, afy

Facility	Capacity	Volume Assumed in Scenario			
		Baseline	Scenario 1	Scenario 2	Scenario 3
Groundwater Treatment					
Wells where groundwater pumped is conveyed to RO Plant					
CPP-1	662	426	426	426	426
P-19	646	—	—	—	581
P-28	565	—	—	—	550
New Well 1	602	—	—	—	542
New Well 2	602	—	—	—	542
New Well 3	602	—	—	—	542
New Well 4	602	—	—	—	542
New Well 5	602	—	—	—	542
Total	**4,883**	**426**	**426**	**426**	**4,267**
Cal Poly RO Plant:	550-4,300 [(b)]	426	426	426	4,267

(a) Injection well capacity is estimated as 25% of the average capacity of the existing production wells in the center of the Spadra Basin
(b) 550 afy is the current capacity and 4,300 afy is the expansion capacity for Scenario 3

Table 3-2a. Water Budget for Spadra Basin - Basin Optimization Scenario 1 -- Fiscal Year 2019-2079 (acre-feet)

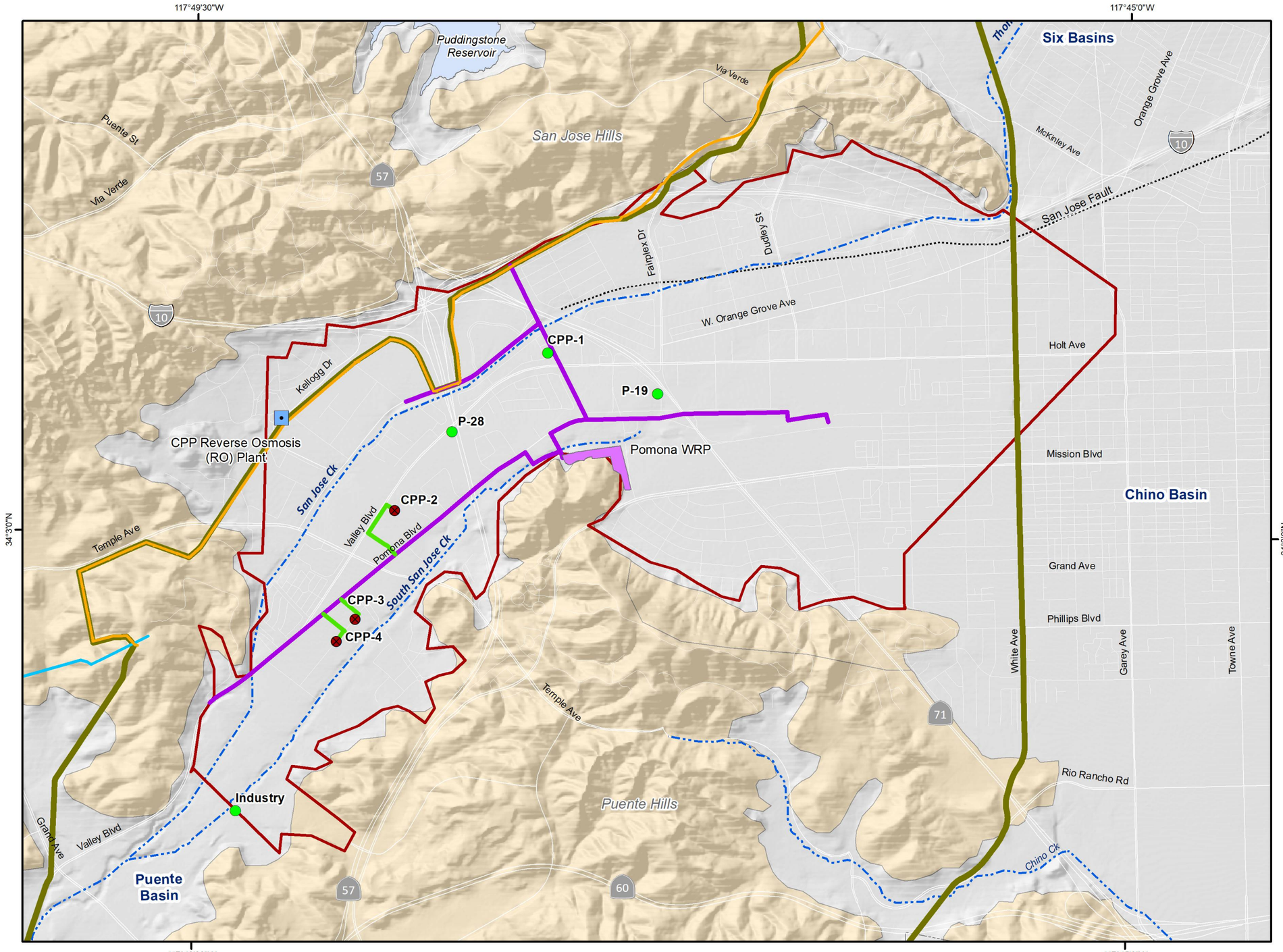
Fiscal Year	Recharge					Discharge				Change in Storage	
	Injection Well	DIPAW	Side Inflows	Vault Recharge	Total Recharge	Groundwater Pumping	Subsurface Outflow to Puente Basin	Subsurface Outflow to Chino Basin	Total Discharge	Total Recharge minus Total Discharge	Cumulative
2019	0	1,581	1,038	0	2,619	843	1,310	537	2,690	(71)	(71)
2020	0	1,705	1,035	0	2,741	707	1,437	389	2,533	207	136
2021	0	1,820	1,039	0	2,859	727	1,440	446	2,612	247	383
2022	0	1,921	1,039	0	2,960	702	1,491	492	2,685	275	658
2023	0	2,033	1,039	0	3,072	702	1,523	535	2,760	313	971
2024	0	2,037	1,036	0	3,073	702	1,543	557	2,802	271	1,242
2025	0	2,164	1,040	0	3,204	1,922	1,388	580	3,890	(686)	556
2026	0	2,168	1,040	0	3,208	1,922	1,254	590	3,766	(558)	(2)
2027	0	2,172	1,040	0	3,212	1,494	1,328	593	3,415	(203)	(205)
2028	0	2,175	1,038	0	3,212	1,494	1,360	593	3,447	(235)	(439)
2029	0	2,178	1,041	0	3,219	1,494	1,354	591	3,439	(221)	(660)
2030	0	2,181	1,041	0	3,222	1,376	1,344	587	3,307	(85)	(745)
2031	0	2,185	1,041	0	3,226	1,376	1,337	582	3,296	(70)	(814)
2032	0	2,188	1,037	0	3,225	1,376	1,332	580	3,288	(63)	(877)
2033	0	2,191	1,040	0	3,231	1,376	1,329	577	3,281	(50)	(927)
2034	0	2,194	1,040	0	3,234	1,376	1,325	573	3,274	(41)	(968)
2035	0	2,195	1,040	0	3,235	1,376	1,322	572	3,271	(36)	(1,003)
2036	0	2,197	1,037	0	3,234	1,376	1,319	570	3,265	(31)	(1,034)
2037	0	2,197	1,040	0	3,237	1,376	1,317	571	3,264	(27)	(1,061)
2038	0	2,198	1,040	0	3,238	1,376	1,314	574	3,264	(27)	(1,088)
2039	0	2,199	1,040	0	3,238	1,376	1,312	577	3,265	(27)	(1,115)
2040	0	2,199	1,037	0	3,235	1,376	1,310	580	3,266	(31)	(1,146)
2041	0	2,199	1,039	0	3,239	1,376	1,309	586	3,271	(32)	(1,178)
2042	0	2,200	1,039	0	3,239	1,376	1,307	594	3,277	(38)	(1,216)
2043	0	2,200	1,039	0	3,239	1,376	1,306	599	3,281	(42)	(1,258)
2044	0	2,201	1,036	0	3,237	1,376	1,304	602	3,283	(46)	(1,304)
2045	0	2,201	1,039	0	3,240	1,376	1,303	605	3,284	(44)	(1,348)
2046	0	2,202	1,038	0	3,240	1,376	1,302	606	3,284	(44)	(1,392)
2047	0	2,203	1,038	0	3,241	1,376	1,301	607	3,284	(43)	(1,435)
2048	0	2,203	1,035	0	3,237	1,376	1,299	607	3,282	(45)	(1,480)
2049	0	2,203	1,038	0	3,241	1,376	1,299	607	3,282	(41)	(1,521)
2050	0	2,204	1,037	0	3,241	1,376	1,298	607	3,281	(40)	(1,562)
2051	0	2,204	1,037	0	3,241	1,376	1,297	608	3,281	(40)	(1,601)
2052	0	2,204	1,034	0	3,238	1,376	1,295	608	3,280	(42)	(1,643)
2053	0	2,205	1,037	0	3,241	1,376	1,295	609	3,280	(38)	(1,681)
2054	0	2,205	1,036	0	3,242	1,376	1,294	609	3,279	(38)	(1,719)
2055	0	2,206	1,036	0	3,242	1,376	1,293	610	3,279	(37)	(1,756)
2056	0	2,206	1,033	0	3,239	1,376	1,292	610	3,278	(39)	(1,795)
2057	0	2,206	1,036	0	3,242	1,376	1,291	610	3,278	(36)	(1,831)
2058	0	2,207	1,035	0	3,242	1,376	1,291	611	3,277	(35)	(1,866)
2059	0	2,207	1,035	0	3,243	1,376	1,290	611	3,277	(34)	(1,900)
2060	0	2,208	1,032	0	3,239	1,376	1,289	611	3,276	(37)	(1,937)
2061	0	2,208	1,035	0	3,243	1,376	1,288	612	3,276	(33)	(1,970)
2062	0	2,208	1,034	0	3,243	1,376	1,288	612	3,276	(33)	(2,003)
2063	0	2,209	1,034	0	3,243	1,376	1,287	612	3,275	(32)	(2,035)
2064	0	2,209	1,031	0	3,240	1,376	1,286	612	3,274	(34)	(2,069)
2065	0	2,210	1,034	0	3,244	1,376	1,285	613	3,274	(31)	(2,100)
2066	0	2,210	1,034	0	3,244	1,376	1,285	613	3,274	(30)	(2,130)
2067	0	2,211	1,033	0	3,244	1,376	1,284	613	3,273	(29)	(2,159)
2068	0	2,211	1,030	0	3,241	1,376	1,283	613	3,272	(32)	(2,191)
2069	0	2,211	1,033	0	3,244	1,376	1,283	613	3,272	(28)	(2,219)
2070	0	2,212	1,033	0	3,244	1,376	1,283	613	3,272	(28)	(2,247)
2071	0	2,212	1,033	0	3,244	1,376	1,282	614	3,272	(27)	(2,274)
2072	0	2,212	1,029	0	3,242	1,376	1,281	617	3,274	(32)	(2,307)
2073	0	2,212	1,033	0	3,245	1,376	1,281	623	3,280	(35)	(2,341)
2074	0	2,213	1,033	0	3,245	1,376	1,280	626	3,282	(37)	(2,379)
2075	0	2,213	1,033	0	3,245	1,376	1,280	627	3,283	(38)	(2,416)
2076	0	2,213	1,029	0	3,242	1,376	1,279	627	3,282	(40)	(2,457)
2077	0	2,213	1,033	0	3,245	1,376	1,279	626	3,281	(35)	(2,492)
2078	0	2,213	1,033	0	3,245	1,376	1,278	613	3,267	(22)	(2,514)
2079	0	2,213	1,033	0	3,245	1,376	1,278	593	3,247	(2)	(2,516)
Statistics for the Calibration Period 2019 through 2079											
Total	0	132,163	63,203	0	195,366	81,509	80,315	36,058	197,882	(2,516)	
Average	0	2,167	1,036	0	3,203	1,336	1,317	591	3,244	(41)	
Median	0	2,203	1,036	0	3,240	1,376	1,298	607	3,277	(36)	
Maximum	0	2,213	1,041	0	3,245	1,922	1,543	627	3,890	313	
Minimum	0	1,581	1,029	0	2,619	702	1,254	389	2,533	(686)	

Table 3-2b. Water Budget for Spadra Basin - Basin Optimization Scenario 2 -- Fiscal Year 2019-2079 (acre-feet)

Fiscal Year	Recharge					Discharge				Change in Storage	
	Injection Well	DIPAW	Side Inflows	Vault Recharge	Total Recharge	Groundwater Pumping	Subsurface Outflow to Puente Basin	Subsurface Outflow to Chino Basin	Total Discharge	Total Recharge minus Total Discharge	Cumulative
2019	0	1,581	1,038	0	2,619	843	1,310	537	2,690	(71)	(71)
2020	0	1,705	1,035	0	2,741	707	1,437	389	2,533	207	136
2021	0	1,820	1,039	0	2,859	727	1,440	446	2,612	247	383
2022	0	1,921	1,039	0	2,960	702	1,491	492	2,685	275	658
2023	0	2,033	1,039	0	3,072	702	1,523	535	2,760	313	971
2024	0	2,037	1,036	0	3,073	702	1,543	557	2,802	271	1,242
2025	0	2,164	1,040	0	3,204	1,922	1,388	580	3,890	(686)	556
2026	0	2,168	1,040	0	3,208	1,922	1,254	590	3,766	(548)	8
2027	250	2,172	1,040	250	3,712	1,922	1,236	593	3,751	(38)	(30)
2028	250	2,175	1,038	250	3,712	1,922	1,253	593	3,768	(56)	(86)
2029	250	2,178	1,041	250	3,719	1,922	1,255	593	3,771	(52)	(138)
2030	250	2,181	1,041	250	3,722	1,806	1,255	590	3,651	71	(67)
2031	250	2,185	1,041	250	3,726	1,806	1,258	587	3,652	74	7
2032	250	2,188	1,037	250	3,725	1,806	1,263	586	3,655	70	77
2033	250	2,191	1,040	250	3,731	1,806	1,268	585	3,659	72	149
2034	250	2,194	1,040	250	3,734	1,806	1,273	583	3,662	72	221
2035	250	2,195	1,040	250	3,735	1,806	1,277	583	3,667	68	289
2036	250	2,197	1,037	250	3,734	1,806	1,281	582	3,669	64	354
2037	250	2,197	1,040	250	3,737	1,806	1,285	585	3,676	62	415
2038	250	2,198	1,040	250	3,738	1,806	1,289	589	3,683	55	470
2039	250	2,199	1,040	250	3,738	1,806	1,292	593	3,691	48	518
2040	250	2,199	1,037	250	3,735	1,806	1,295	597	3,698	38	556
2041	250	2,199	1,039	250	3,739	1,806	1,298	604	3,708	31	587
2042	250	2,200	1,039	250	3,739	1,806	1,300	613	3,719	21	607
2043	250	2,200	1,039	250	3,739	1,806	1,303	618	3,727	13	620
2044	250	2,201	1,036	250	3,737	1,806	1,305	622	3,733	4	624
2045	250	2,201	1,039	250	3,740	1,806	1,307	625	3,738	2	626
2046	250	2,202	1,038	250	3,740	1,806	1,309	627	3,742	(2)	624
2047	250	2,203	1,038	250	3,741	1,806	1,310	628	3,744	(4)	620
2048	250	2,203	1,035	250	3,737	1,806	1,311	629	3,746	(9)	611
2049	250	2,203	1,038	250	3,741	1,806	1,313	630	3,749	(8)	603
2050	250	2,204	1,037	250	3,741	1,806	1,314	630	3,750	(9)	594
2051	250	2,204	1,037	250	3,741	1,806	1,315	631	3,752	(11)	583
2052	250	2,204	1,034	250	3,738	1,806	1,316	632	3,753	(15)	568
2053	250	2,205	1,037	250	3,741	1,806	1,316	633	3,755	(14)	554
2054	250	2,205	1,036	250	3,742	1,806	1,317	633	3,757	(15)	539
2055	250	2,206	1,036	250	3,742	1,806	1,318	634	3,758	(16)	523
2056	250	2,206	1,033	250	3,739	1,806	1,318	635	3,758	(20)	504
2057	250	2,206	1,036	250	3,742	1,806	1,318	635	3,760	(18)	486
2058	250	2,207	1,035	250	3,742	1,806	1,319	636	3,761	(18)	468
2059	250	2,207	1,035	250	3,743	1,806	1,319	636	3,761	(19)	449
2060	250	2,208	1,032	250	3,739	1,806	1,319	637	3,762	(22)	427
2061	250	2,208	1,035	250	3,743	1,806	1,319	637	3,762	(20)	407
2062	250	2,208	1,034	250	3,743	1,806	1,319	638	3,763	(20)	387
2063	250	2,209	1,034	250	3,743	1,806	1,319	638	3,763	(20)	367
2064	250	2,209	1,031	250	3,740	1,806	1,319	638	3,763	(23)	344
2065	250	2,210	1,034	250	3,744	1,806	1,319	639	3,764	(20)	323
2066	250	2,210	1,034	250	3,744	1,806	1,319	639	3,764	(20)	303
2067	250	2,211	1,033	250	3,744	1,806	1,319	639	3,764	(20)	283
2068	250	2,211	1,030	250	3,741	1,806	1,318	640	3,764	(23)	260
2069	250	2,211	1,033	250	3,744	1,806	1,318	640	3,764	(20)	240
2070	250	2,212	1,033	250	3,744	1,806	1,318	640	3,764	(20)	219
2071	250	2,212	1,033	250	3,744	1,806	1,318	641	3,764	(20)	199
2072	250	2,212	1,029	250	3,742	1,806	1,318	644	3,767	(26)	174
2073	250	2,212	1,033	250	3,745	1,806	1,317	650	3,773	(28)	145
2074	250	2,213	1,033	250	3,745	1,806	1,317	653	3,776	(31)	114
2075	250	2,213	1,033	250	3,745	1,806	1,317	654	3,777	(32)	82
2076	250	2,213	1,029	250	3,742	1,806	1,317	655	3,777	(35)	47
2077	250	2,213	1,033	250	3,745	1,806	1,316	653	3,775	(30)	17
2078	250	2,213	1,033	250	3,745	1,806	1,316	640	3,762	(17)	(0)
2079	250	2,213	1,033	250	3,745	1,806	1,316	621	3,742	3	3
Statistics for the Calibration Period 2019 through 2079											
Total	13,250	132,163	63,203	13,250	221,866	104,293	80,448	37,132	221,873	3	
Average	217	2,167	1,036	217	3,637	1,710	1,319	609	3,637	0	
Median	250	2,203	1,036	250	3,740	1,806	1,316	629	3,753	(15)	
Maximum	250	2,213	1,041	250	3,745	1,922	1,543	655	3,890	313	
Minimum	0	1,581	1,029	0	2,619	702	1,236	389	2,533	(686)	

Table 3-2c. Water Budget for Spadra Basin - Basin Optimization Scenario 3 -- Fiscal Year 2019-2079 (acre-feet)

Fiscal Year	Recharge					Discharge				Change in Storage	
	Injection Well	DIPAW	Side Inflows	Vault Recharge	Total Recharge	Groundwater Pumping	Subsurface Outflow to Puente Basin	Subsurface Outflow to Chino Basin	Total Discharge	Total Recharge minus Total Discharge	Cumulative
2019	0	1,581	1,038	0	2,619	843	1,310	537	2,690	(71)	(71)
2020	0	1,705	1,035	0	2,741	707	1,437	389	2,533	207	136
2021	0	1,820	1,039	0	2,859	727	1,440	446	2,612	247	383
2022	0	1,921	1,039	0	2,960	702	1,491	492	2,685	275	658
2023	0	2,033	1,039	0	3,072	702	1,523	535	2,760	313	971
2024	0	2,037	1,036	0	3,073	702	1,543	557	2,802	271	1,242
2025	0	2,164	1,040	0	3,204	1,922	1,388	580	3,890	(686)	556
2026	0	2,168	1,040	0	3,208	1,922	1,254	590	3,766	(558)	(2)
2027	0	2,172	1,040	0	3,212	1,922	1,195	593	3,710	(498)	(500)
2028	0	2,175	1,038	0	3,212	1,922	1,155	593	3,669	(457)	(957)
2029	0	2,178	1,041	0	3,219	1,922	1,122	591	3,635	(412)	(1,369)
2030	3,150	2,181	1,041	350	6,722	4,806	1,123	585	6,513	209	(1,160)
2031	3,150	2,185	1,041	350	6,726	4,806	1,243	576	6,625	101	(1,060)
2032	3,150	2,188	1,037	350	6,725	4,806	1,290	568	6,664	61	(999)
2033	3,150	2,191	1,040	350	6,731	4,806	1,306	561	6,674	58	(941)
2034	3,150	2,194	1,040	350	6,734	4,806	1,313	556	6,675	58	(883)
2035	3,150	2,195	1,040	350	6,735	4,806	1,317	555	6,679	57	(826)
2036	3,150	2,197	1,037	350	6,734	4,806	1,321	553	6,680	54	(772)
2037	3,150	2,197	1,040	350	6,737	4,806	1,324	555	6,685	53	(719)
2038	3,150	2,198	1,040	350	6,738	4,806	1,327	558	6,691	47	(673)
2039	3,150	2,199	1,040	350	6,738	4,806	1,329	562	6,697	41	(632)
2040	3,150	2,199	1,037	350	6,735	4,806	1,332	566	6,704	32	(600)
2041	3,150	2,199	1,039	350	6,739	4,806	1,334	573	6,713	26	(574)
2042	3,150	2,200	1,039	350	6,739	4,806	1,336	581	6,723	16	(558)
2043	3,150	2,200	1,039	350	6,739	4,806	1,338	587	6,731	8	(550)
2044	3,150	2,201	1,036	350	6,737	4,806	1,340	591	6,737	0	(550)
2045	3,150	2,201	1,039	350	6,740	4,806	1,341	594	6,741	(1)	(551)
2046	3,150	2,202	1,038	350	6,740	4,806	1,343	596	6,745	(5)	(556)
2047	3,150	2,203	1,038	350	6,741	4,806	1,344	597	6,747	(6)	(562)
2048	3,150	2,203	1,035	350	6,737	4,806	1,345	597	6,749	(11)	(573)
2049	3,150	2,203	1,038	350	6,741	4,806	1,346	598	6,751	(10)	(583)
2050	3,150	2,204	1,037	350	6,741	4,806	1,347	599	6,752	(11)	(594)
2051	3,150	2,204	1,037	350	6,741	4,806	1,348	599	6,754	(12)	(606)
2052	3,150	2,204	1,034	350	6,738	4,806	1,349	600	6,755	(17)	(623)
2053	3,150	2,205	1,037	350	6,741	4,806	1,349	601	6,756	(15)	(638)
2054	3,150	2,205	1,036	350	6,742	4,806	1,350	602	6,758	(16)	(654)
2055	3,150	2,206	1,036	350	6,742	4,806	1,350	602	6,759	(17)	(671)
2056	3,150	2,206	1,033	350	6,739	4,806	1,350	603	6,759	(21)	(691)
2057	3,150	2,206	1,036	350	6,742	4,806	1,351	604	6,760	(18)	(710)
2058	3,150	2,207	1,035	350	6,742	4,806	1,351	604	6,761	(19)	(729)
2059	3,150	2,207	1,035	350	6,743	4,806	1,351	605	6,762	(19)	(748)
2060	3,150	2,208	1,032	350	6,739	4,806	1,351	605	6,762	(23)	(771)
2061	3,150	2,208	1,035	350	6,743	4,806	1,351	606	6,763	(20)	(791)
2062	3,150	2,208	1,034	350	6,743	4,806	1,351	606	6,763	(20)	(811)
2063	3,150	2,209	1,034	350	6,743	4,806	1,351	606	6,764	(20)	(832)
2064	3,150	2,209	1,031	350	6,740	4,806	1,351	607	6,764	(24)	(856)
2065	3,150	2,210	1,034	350	6,744	4,806	1,351	607	6,764	(21)	(876)
2066	3,150	2,210	1,034	350	6,744	4,806	1,351	607	6,764	(21)	(897)
2067	3,150	2,211	1,033	350	6,744	4,806	1,351	607	6,764	(20)	(918)
2068	3,150	2,211	1,030	350	6,741	4,806	1,351	608	6,764	(24)	(941)
2069	3,150	2,211	1,033	350	6,744	4,806	1,351	608	6,765	(20)	(962)
2070	3,150	2,212	1,033	350	6,744	4,806	1,350	608	6,765	(20)	(982)
2071	3,150	2,212	1,033	350	6,744	4,806	1,350	609	6,765	(20)	(1,002)
2072	3,150	2,212	1,029	350	6,742	4,806	1,350	612	6,768	(26)	(1,028)
2073	3,150	2,212	1,033	350	6,745	4,806	1,350	618	6,774	(29)	(1,057)
2074	3,150	2,213	1,033	350	6,745	4,806	1,350	621	6,776	(31)	(1,088)
2075	3,150	2,213	1,033	350	6,745	4,806	1,349	622	6,777	(32)	(1,121)
2076	3,150	2,213	1,029	350	6,742	4,806	1,349	623	6,777	(35)	(1,156)
2077	3,150	2,213	1,033	350	6,745	4,806	1,349	621	6,776	(31)	(1,187)
2078	3,150	2,213	1,033	350	6,745	4,806	1,348	608	6,763	(17)	(1,204)
2079	3,150	2,213	1,033	350	6,745	4,806	1,348	589	6,742	3	(1,201)
Statistics for the Calibration Period 2019 through 2079											
Total	157,500	132,163	63,203	17,500	370,366	254,293	81,652	35,626	371,571	(1,201)	
Average	2,582	2,167	1,036	287	6,072	4,169	1,339	584	6,091	(20)	
Median	3,150	2,203	1,036	350	6,740	4,806	1,349	597	6,749	(17)	
Maximum	3,150	2,213	1,041	350	6,745	4,806	1,543	623	6,777	313	
Minimum	0	1,581	1,029	0	2,619	702	1,122	389	2,533	(686)	



Existing Facilities

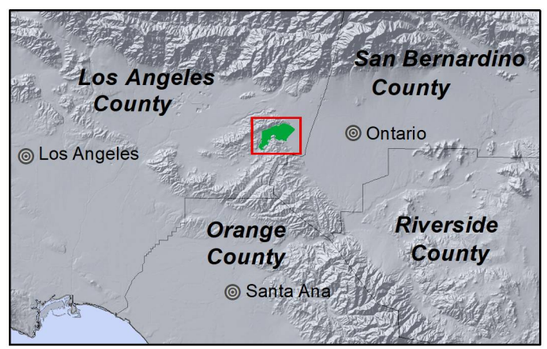
- Production Well Active in Scenario1
- Production Well Inactive in Scenario1
- Pomona Water Reclamation Plant (WRP)
- Pomona WRP Recycled Water Pipeline
- CPP Reverse Osmosis (RO) Plant

Planned New Facilities for Scenario 1

- Recycled Water Pipeline

Imported Water Pipelines

- Pomona Walnut Rowland (PWR) Joint Feeder (Treated)
- Badillo Grand Pipeline (Treated)
- MWD Orange County Feeder (Treated), and Yorba Linda Feeder (Raw)
- Streams & Flood Control Channels
- Spadra Basin (GSP Boundary)



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Author: VMW
Date: 9/30/2021
File: Figure 3-1a Facilities_Sc1.mxd

0 0.5 1 1.5 Miles
0 0.5 1 1.5 2 Kilometers

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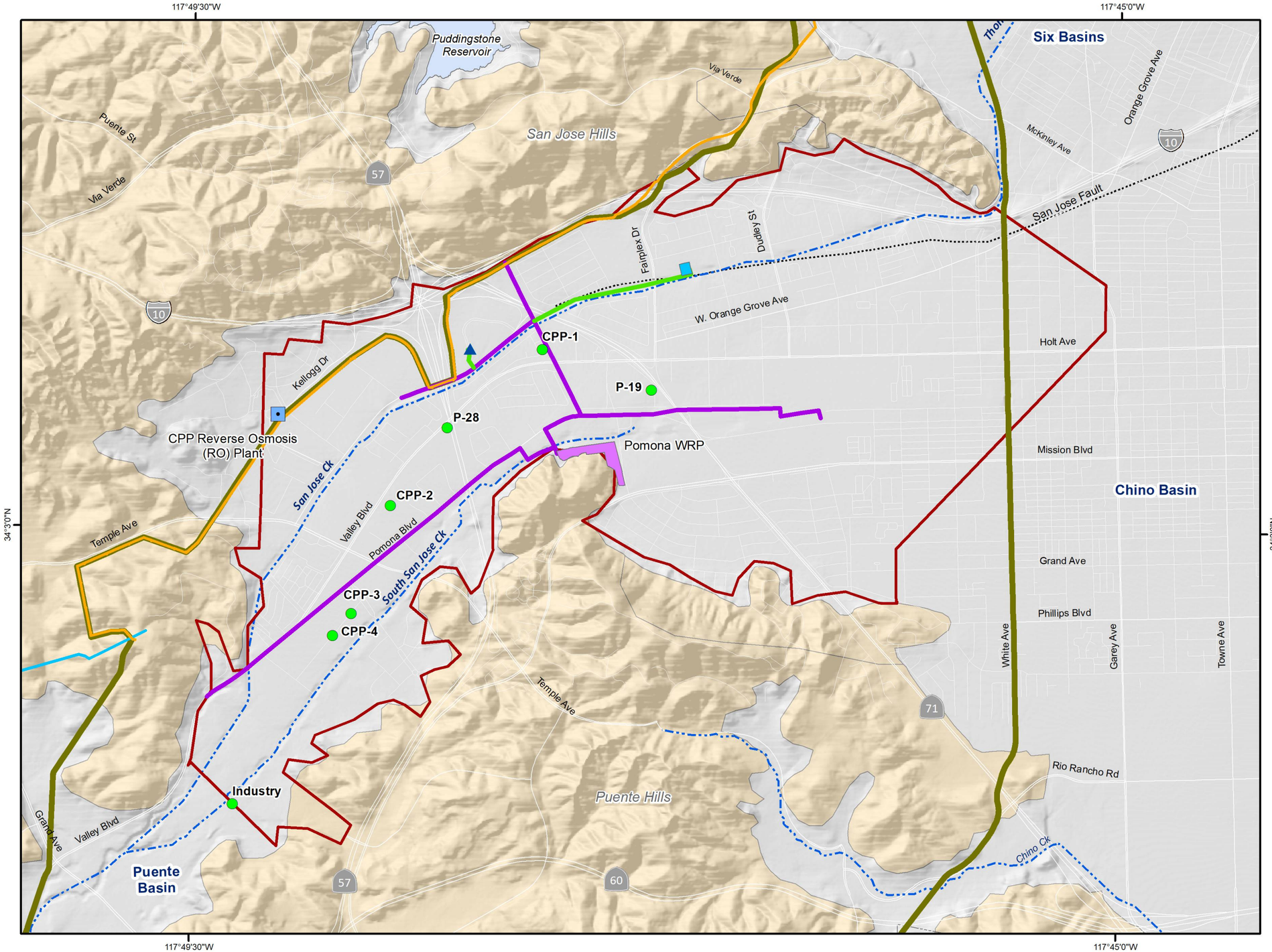
Spadra Basin Groundwater Sustainability Agency
Groundwater Sustainability Plan

SPADRA BASIN GROUNDWATER SUSTAINABILITY AGENCY

Location Map of Facilities for Basin Optimization Scenario 1

Figure 3-1a



Existing Facilities

- Production Well Active in Scenario 2
- Pomona Water Reclamation Plant (WRP)
- Pomona WRP Recycled Water Pipeline
- CPP Reverse Osmosis (RO) Plant

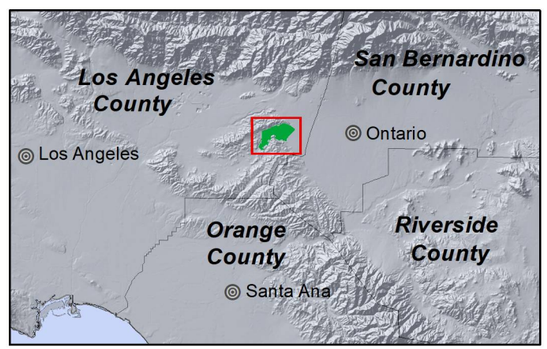
Planned New Facilities for Scenario 2

- Underground Recharge Gallery
- Injection Well
- Recycled Water Pipeline

Imported Water Pipelines

- Pomona Walnut Rowland (PWR) Joint Feeder (Treated)
- Badillo Grand Pipeline (Treated)
- MWD Orange County Feeder (Treated), and Yorba Linda Feeder (Raw)

- Streams & Flood Control Channels
- Spadra Basin (GSP Boundary)



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Author: VMW
Date: 9/30/2021
File: Figure 3-1b Facilities_Sc2.mxd

0 0.5 1 1.5 Miles
0 0.5 1 1.5 2 Kilometers

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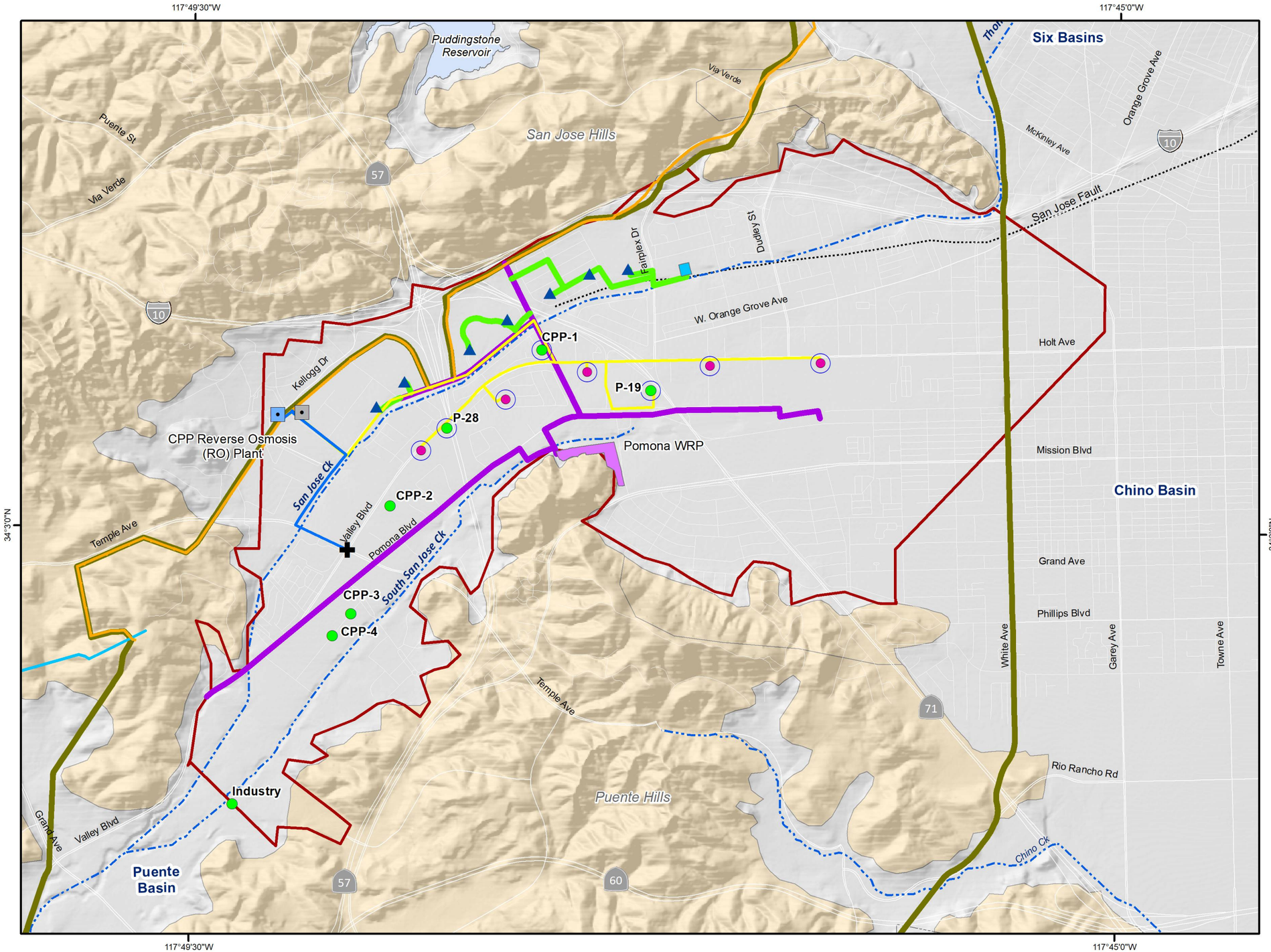
Groundwater Sustainability Plan

SPADRA BASIN GROUNDWATER SUSTAINABILITY AGENCY

Location Map of Facilities for Basin Optimization Scenario 2

Figure 3-1b



Existing Facilities

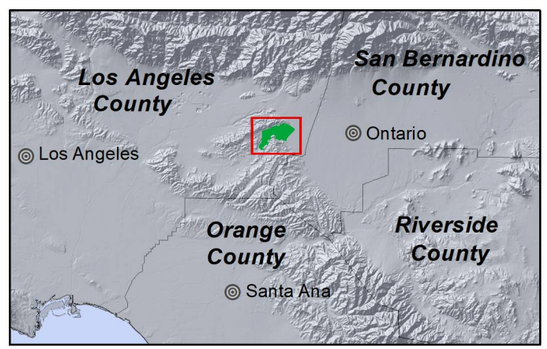
- Production Well Active in Scenario 3
- Pomona Water Reclamation Plant (WRP)
- Pomona WRP Recycled Water Pipeline
- CPP Reverse Osmosis (RO) Plant
- Intertie between WVWD and Pomona

Planned New Facilities for Scenario 3

- Underground Recharge Gallery
- Injection Well
- Production Well
- Well - Groundwater is Conveyed to RO Plant
- New Expanded RO Plant
- Recycled Water Pipeline
- RO Plant Influent Pipeline
- RO Effluent Pipeline to Intertie

Imported Water Pipelines

- Pomona Walnut Rowland (PWR) Joint Feeder (Treated)
- Badillo Grand Pipeline (Treated)
- MWD Orange County Feeder (Treated), and Yorba Linda Feeder (Raw)
- Streams & Flood Control Channels
- Spadra Basin (GSP Boundary)



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Author: VMW
Date: 9/30/2021
File: Figure 3-1c Facilities_Sc3.mxd

0 0.5 1 1.5 Miles
0 0.5 1 1.5 2 Kilometers

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Groundwater Sustainability Plan

SPADRA BASIN GROUNDWATER SUSTAINABILITY AGENCY

Location Map of Facilities for Basin Optimization Scenario 3

Figure 3-1c

Groundwater Level Response

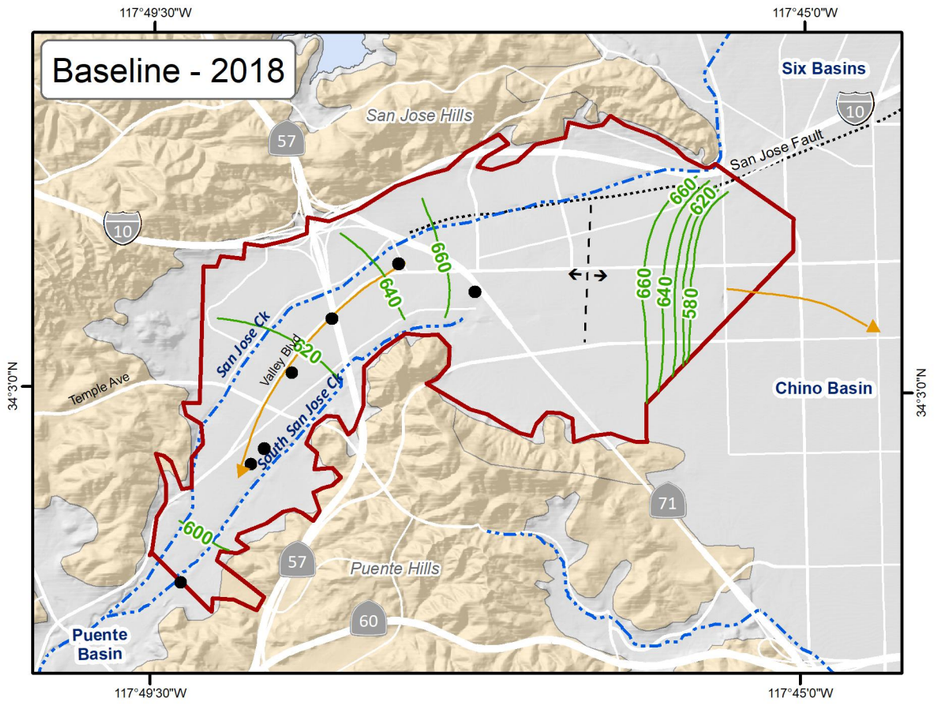
Groundwater Elevation and Groundwater-Flow Directions

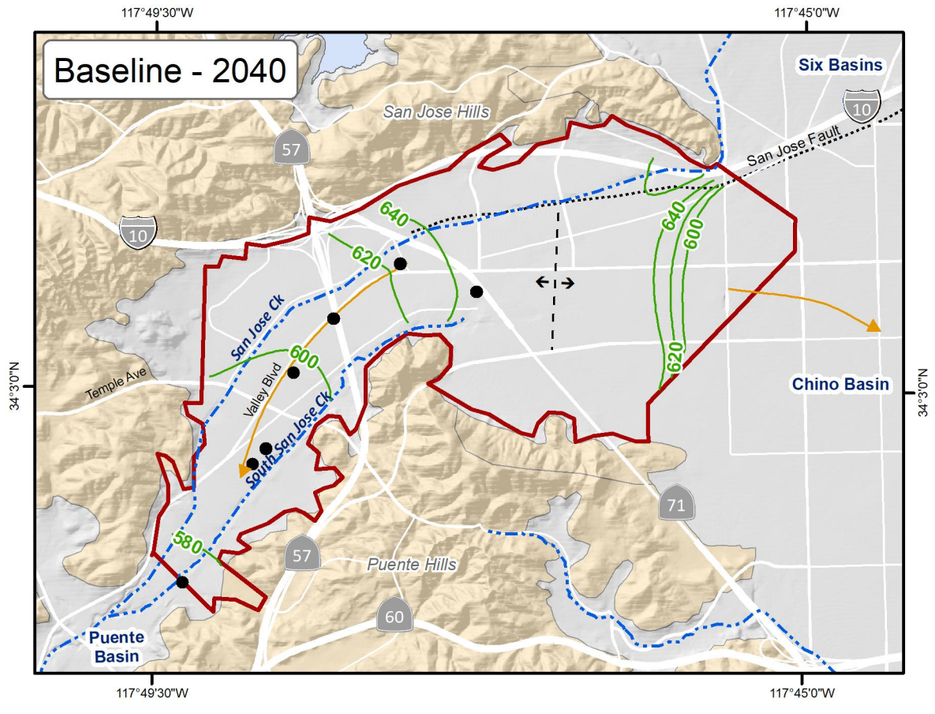
Figures 3-2a through 3-2d are maps showing the model-estimated groundwater elevations and flow directions for the Baseline Scenario and the three Basin Optimization Scenarios for the years 2018 (start of the planning period prior to implementation), 2040, 2050, and 2079 (end of the planning period). Also shown on the maps are the pumping and recharge facilities assumed to be operational in the scenarios.

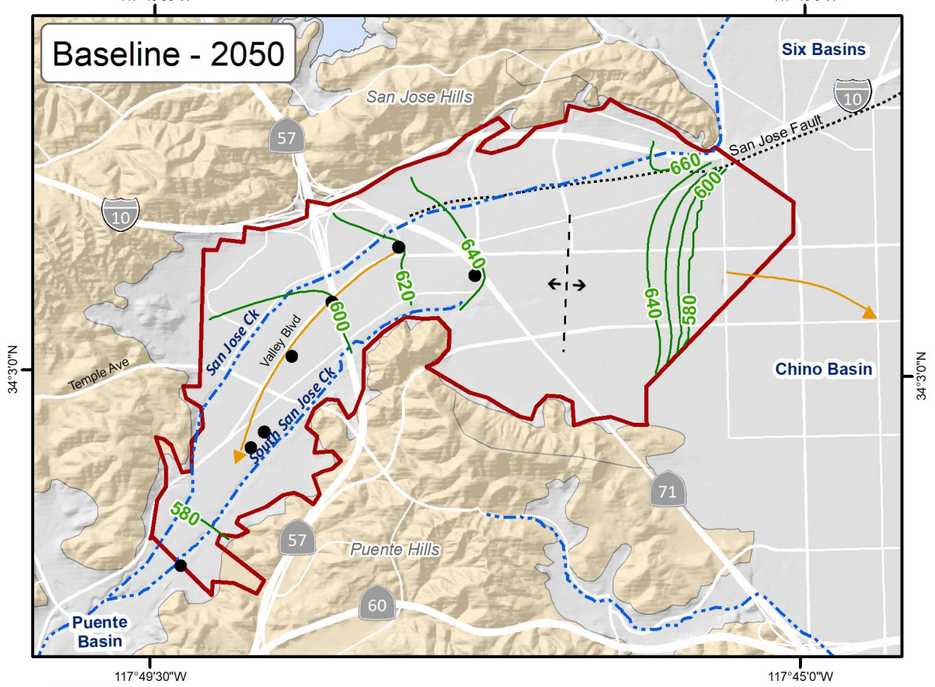
The groundwater-elevation contours are used to analyze and interpret the groundwater-flow directions over the planning period—groundwater flows perpendicular to the contours from higher to lower elevation:

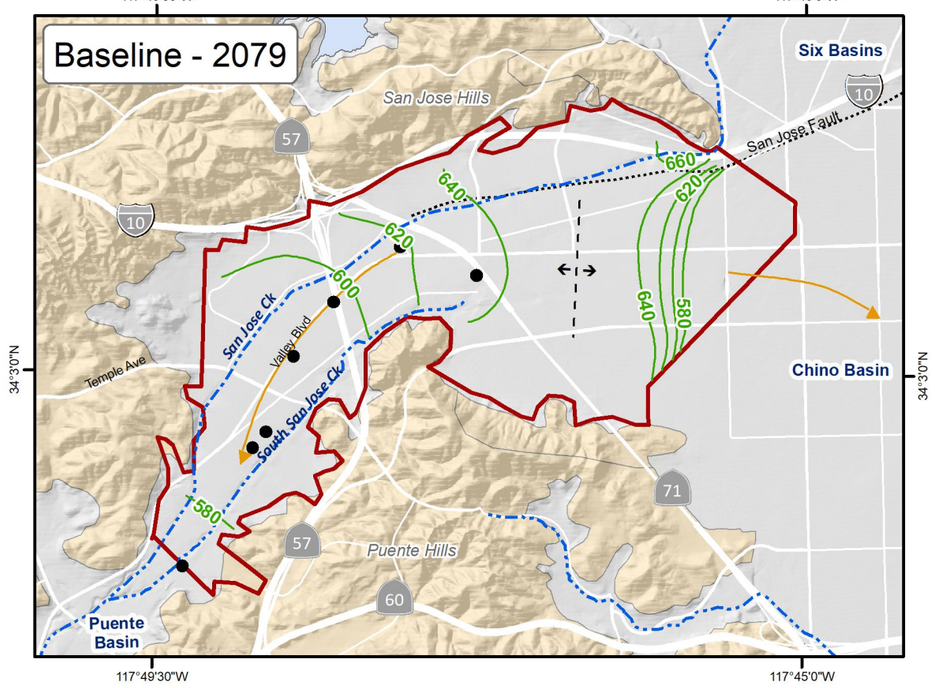
- In the **Baseline Scenario**, the general groundwater-flow directions remain relatively constant over the planning period and are similar to what was observed historically as described in TM 1. There is a north/south-oriented groundwater divide located in the eastern portion of the basin. In the east, groundwater flows from the groundwater divide towards Chino Basin. West of the groundwater divide, groundwater flows toward Puente Basin. The location of the groundwater divide oscillates slightly in the east/west directions over the planning period.
- In **Basin Optimization Scenarios 1 & 2**, the groundwater-flow directions are not significantly different than the groundwater-flow directions in the Baseline Scenario.

In Basin Optimization Scenario 3, the increases in recharge and pumping cause a change in groundwater-flow directions to a north-to-south direction in the central portion of the basin, and the groundwater divide shifts to the east towards Chino Basin.









—600— Groundwater-Elevation Contours (ft-amsl)

General Groundwater-Flow Direction

Groundwater Divide (approximate)

Pumping and Recharge Facilities

Production Well Active in Baseline

Streams & Flood Control Channels

Spadra Basin (GSP Boundary)

Geology

Water-Bearing Sediments

Quaternary Alluvium

Consolidated Bedrock

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

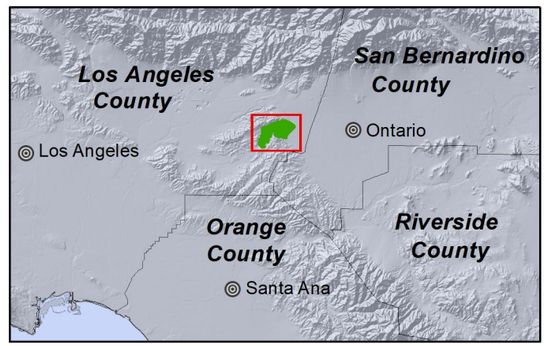
Faults

Location Certain

Location Concealed

Location Approximate

Location Uncertain



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Author: AC
Date: 9/10/2021
File: Figure 3-2a_GWEL_Contours_BL.mxd

0 0.5 1 1.5 Miles

0 0.5 1 1.5 2 Kilometers

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Spadra Basin Groundwater Sustainability Agency

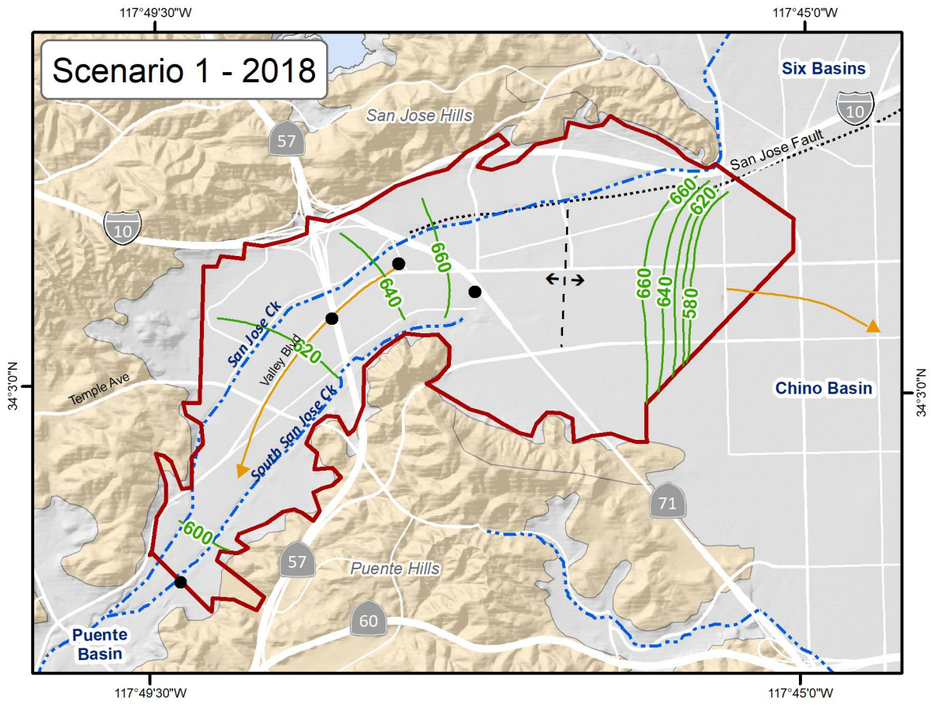
Groundwater Sustainability Plan

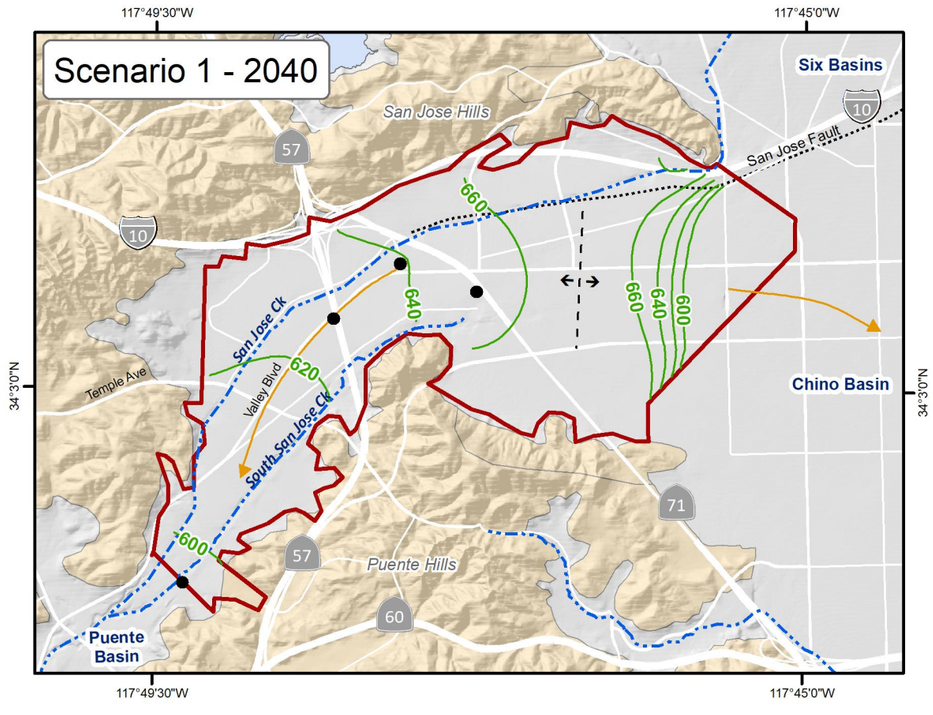
SPADRA BASIN GROUNDWATER SUSTAINABILITY AGENCY

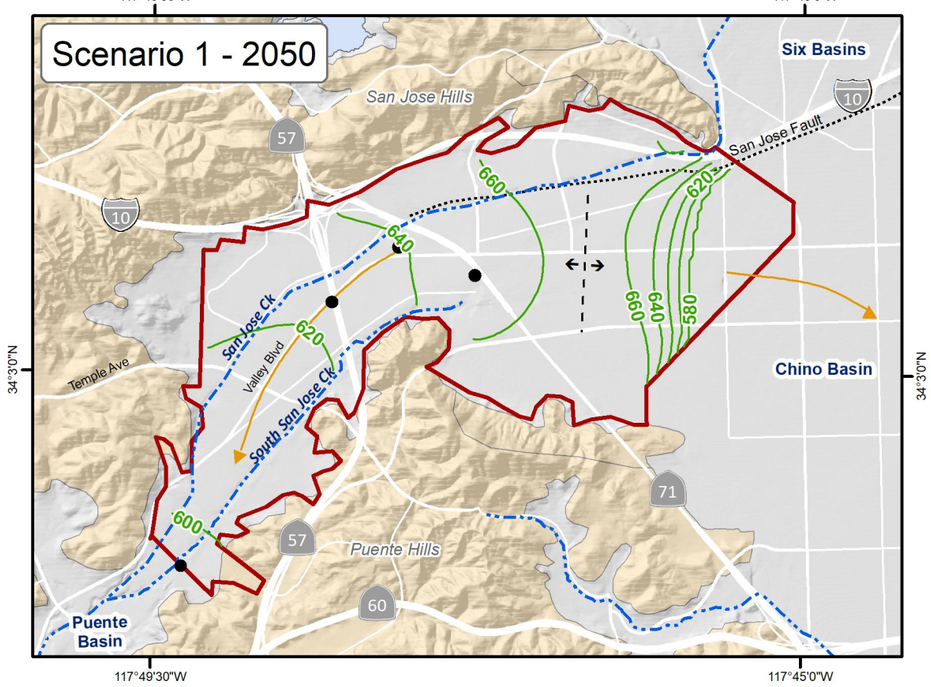
Groundwater Elevation and Flow Direction

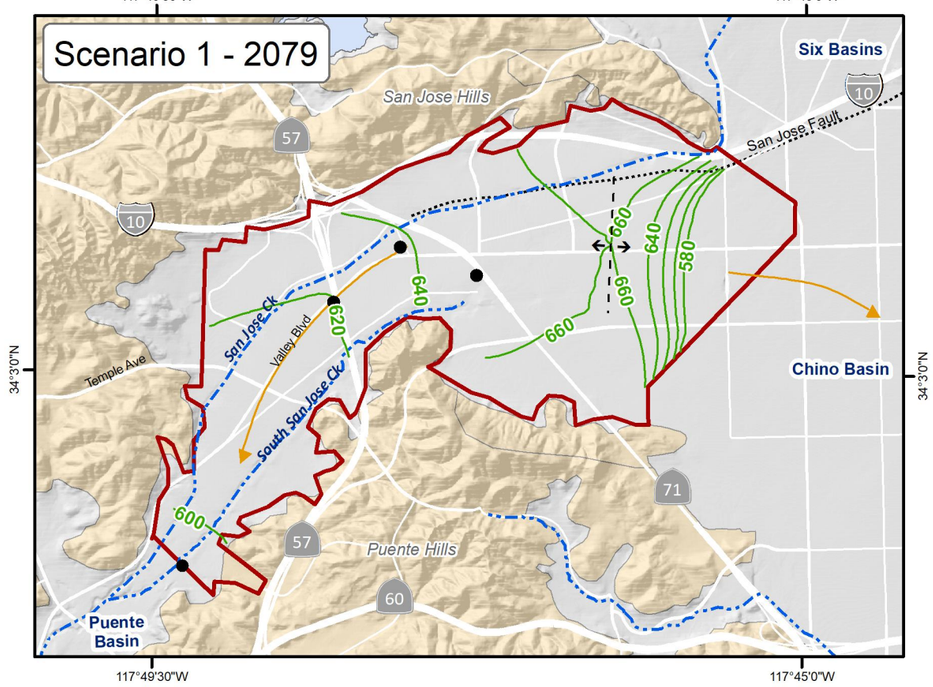
Baseline Scenario

Figure 3-2a









600 Groundwater-Elevation Contours (ft-amsl)

General Groundwater-Flow Direction

Groundwater Divide (approximate)

Pumping and Recharge Facilities

Production Well Active in Scenario 1

Streams & Flood Control Channels

Spadra Basin (GSP Boundary)

Geology

Water-Bearing Sediments

Quaternary Alluvium

Consolidated Bedrock

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

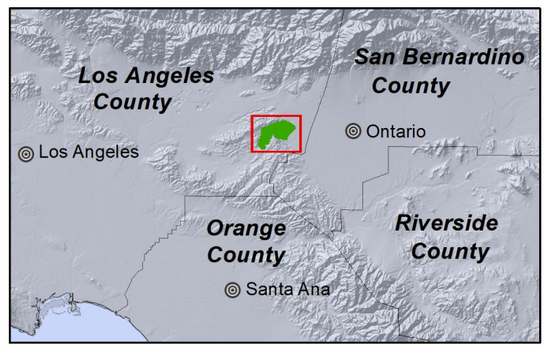
Faults

Location Certain

Location Concealed

Location Approximate

Location Uncertain



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WEST YOST
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Author: AC
Date: 9/10/2021
File: Figure 3-2b_GWEL_Contours_S1.mxd

0 0.5 1 1.5 Miles

0 0.5 1 1.5 2 Kilometers

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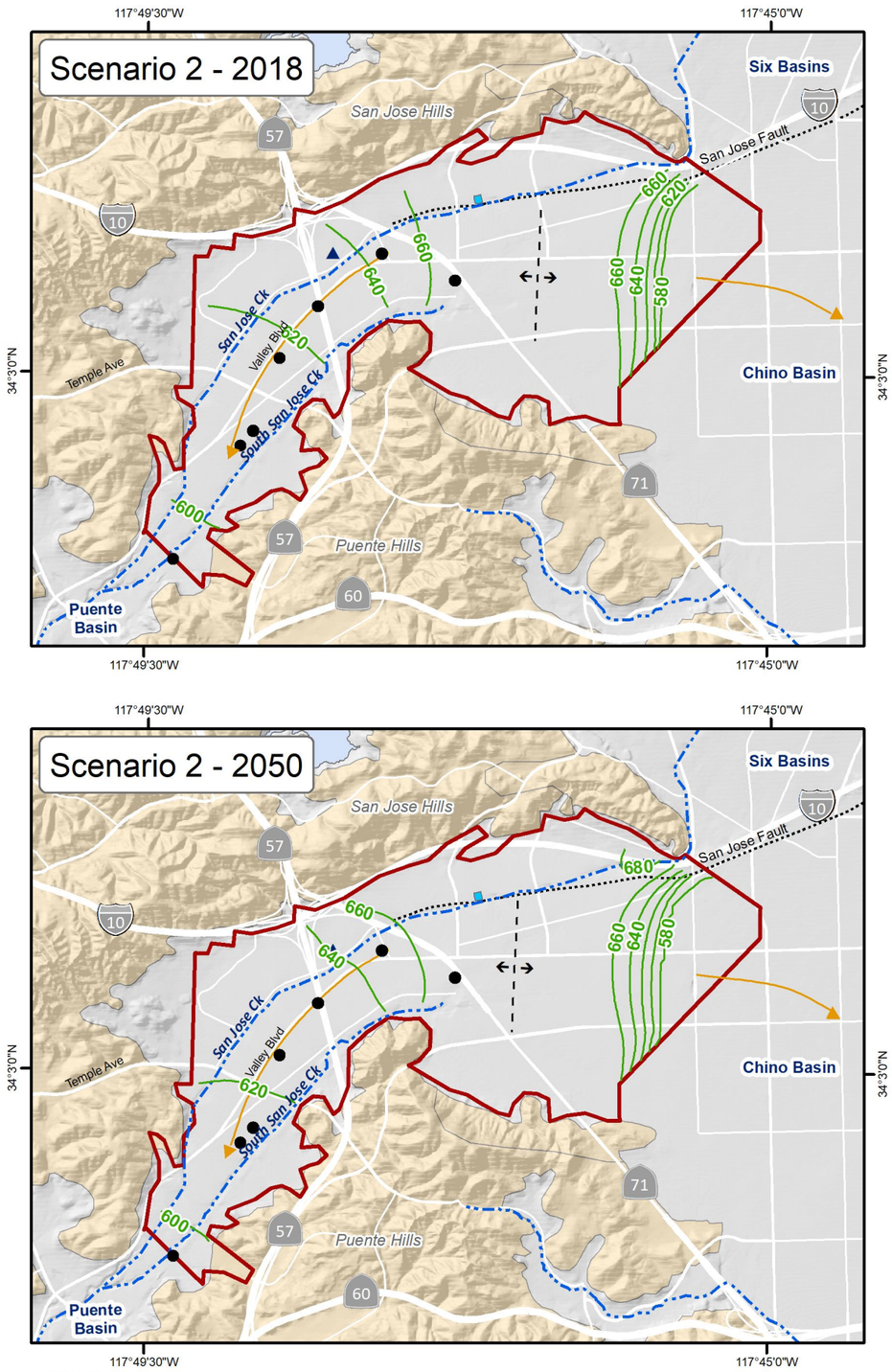
Groundwater Sustainability Plan

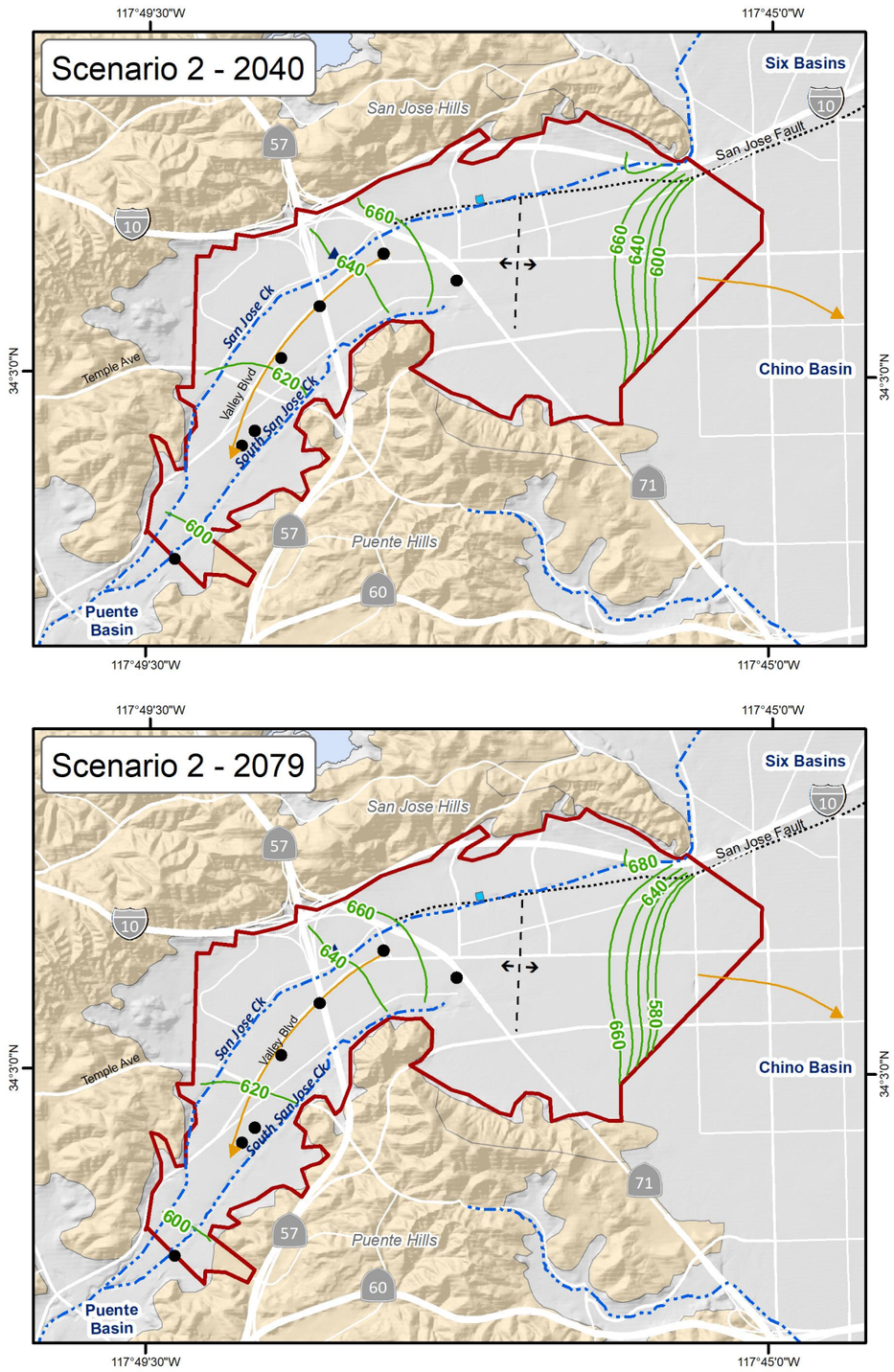
SPADRA BASIN GROUNDWATER SUSTAINABILITY AGENCY

Groundwater Elevation and Flow Direction

Basin Optimization Scenario 1

Figure 3-2b





—600— Groundwater-Elevation Contours (ft-amsl)

General Groundwater-Flow Direction

Groundwater Divide (approximate)

Pumping and Recharge Facilities

- Production Well Active in Scenario 2
- Underground Recharge Gallery in Scenario 2
- Injection Well in Scenario 2

Streams & Flood Control Channels

Spadra Basin (GSP Boundary)

Geology

Water-Bearing Sediments

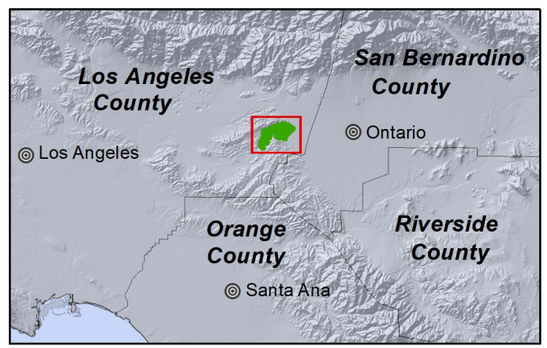
- Quaternary Alluvium

Consolidated Bedrock

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

Faults

- Location Certain
- Location Approximate
- Location Concealed
- Location Uncertain



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Date: 9/10/2021
File: Figure 3-2c_GWEL_Contours_S2.mxd

0 0.5 1 1.5 Miles

0 0.5 1 1.5 2 Kilometers

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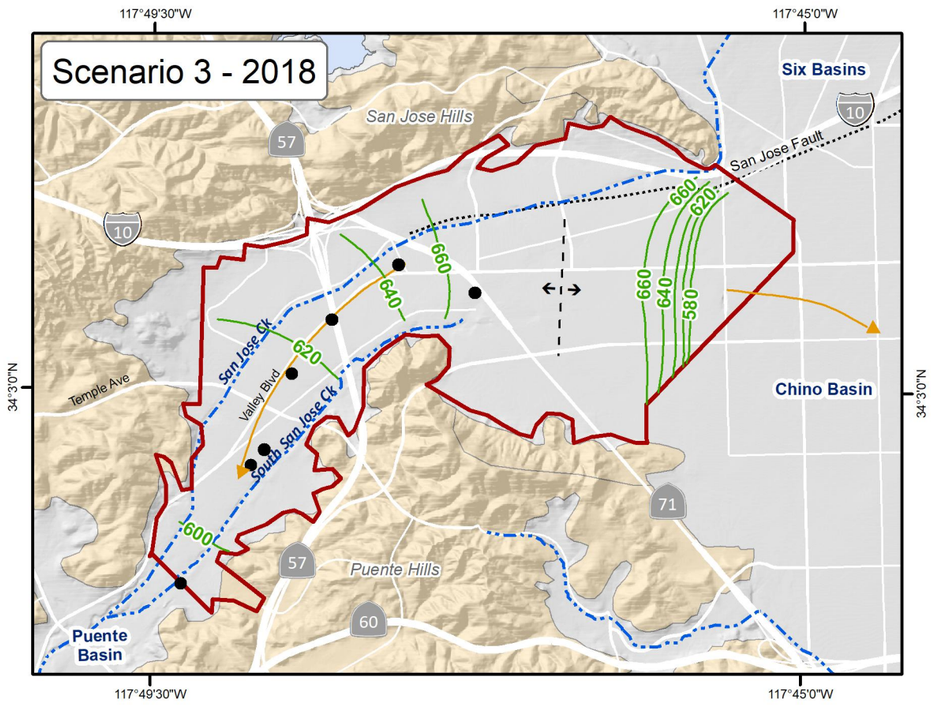
Groundwater Sustainability Plan

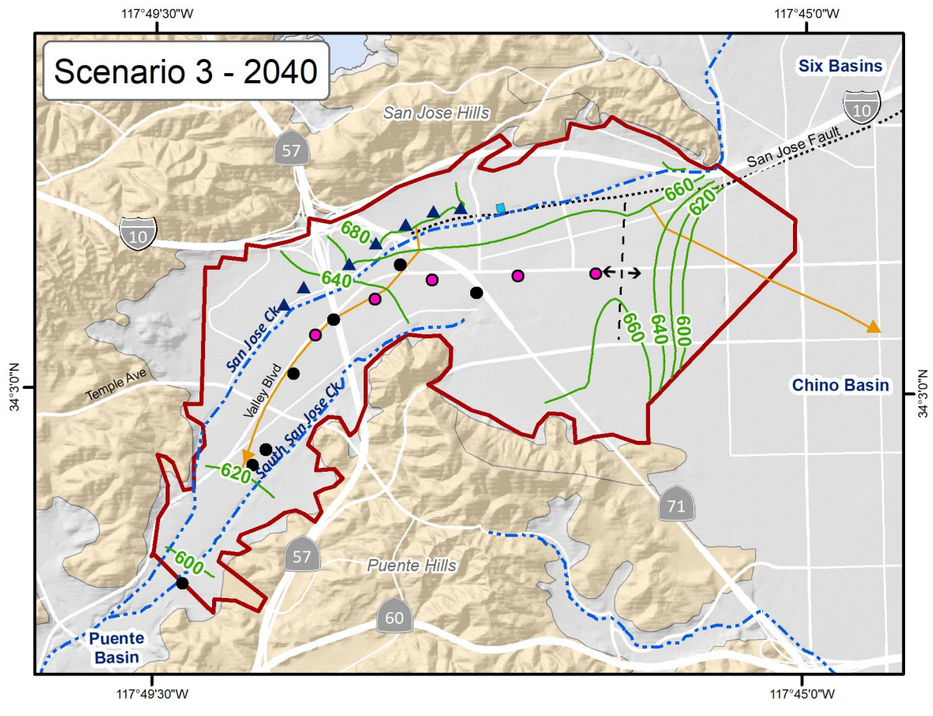
SPADRA BASIN GROUNDWATER SUSTAINABILITY AGENCY

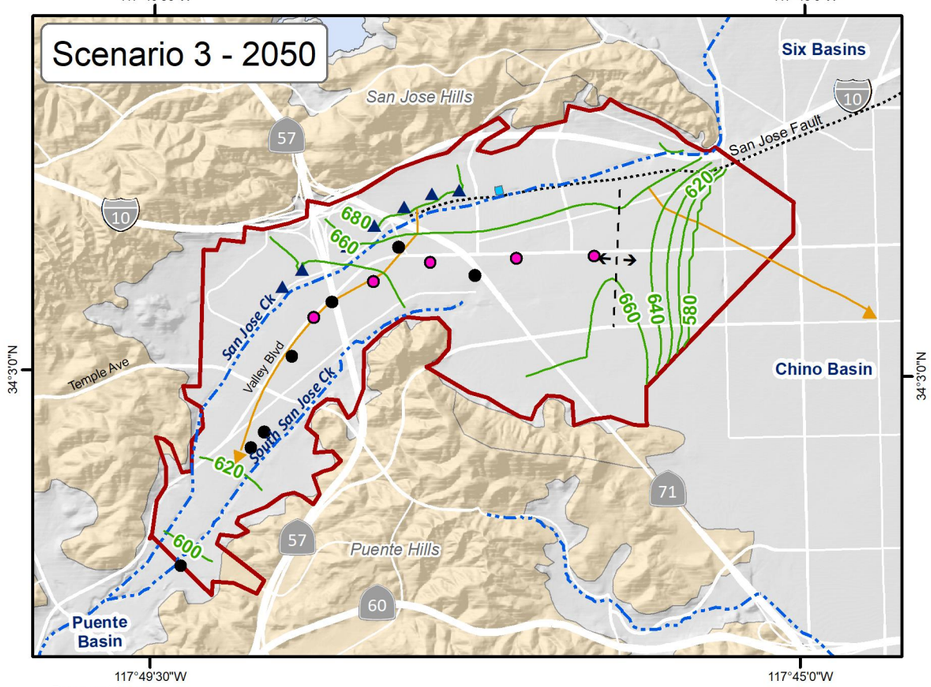
Groundwater Elevation and Flow Direction

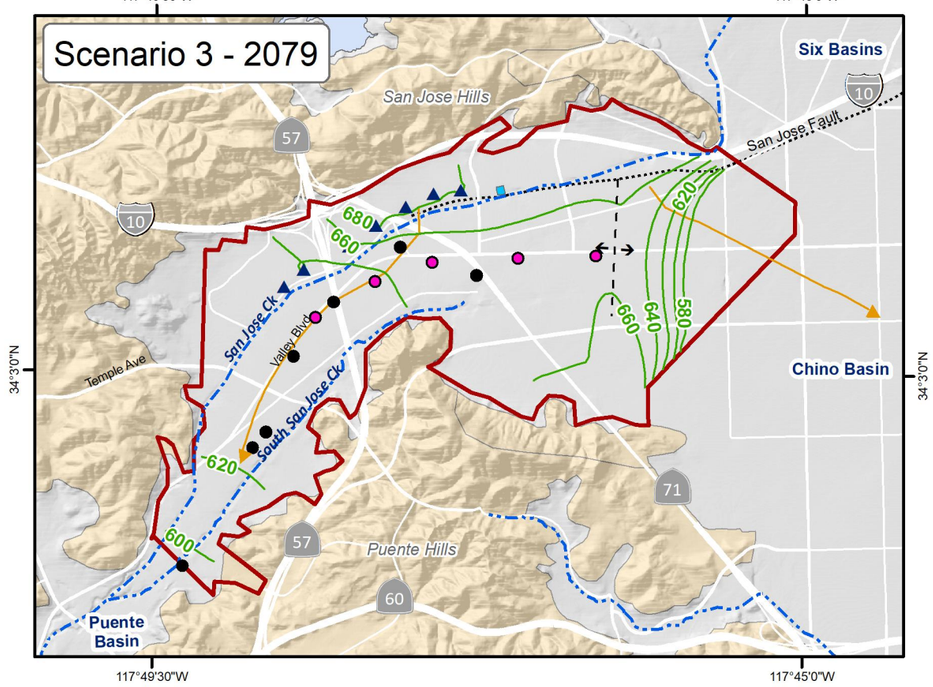
Basin Optimization Scenario 2

Figure 3-2c









—600— Groundwater-Elevation Contours (ft-amsl)

General Groundwater-Flow Direction

Groundwater Divide (approximate)

Pumping and Recharge Facilities

- Production Well Active in Scenario 3
- Underground Recharge Gallery in Scenario 3
- Injection Wells in Scenario 3
- New Production Wells in Scenario 3

Streams & Flood Control Channels

Spadra Basin (GSP Boundary)

Geology

Water-Bearing Sediments

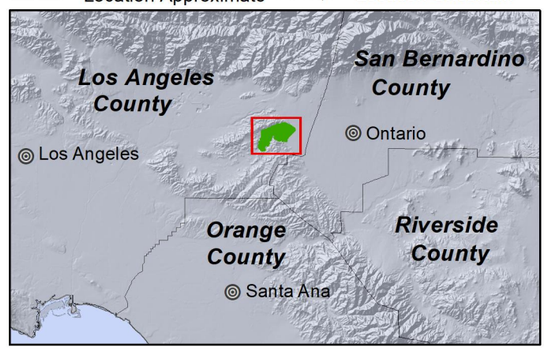
- Quaternary Alluvium

Consolidated Bedrock

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

Faults

- Location Certain
- Location Concealed
- Location Approximate
- Location Uncertain



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Date: 9/10/2021
File: Figure 3-2d_GWEL_Contours_S3.mxd

0 0.5 1 1.5 Miles

0 0.5 1 1.5 2 Kilometers

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Spadra Basin Groundwater Sustainability Agency
Groundwater Sustainability Plan

SPADRA BASIN GROUNDWATER SUSTAINABILITY AGENCY

Groundwater Elevation and Flow Direction

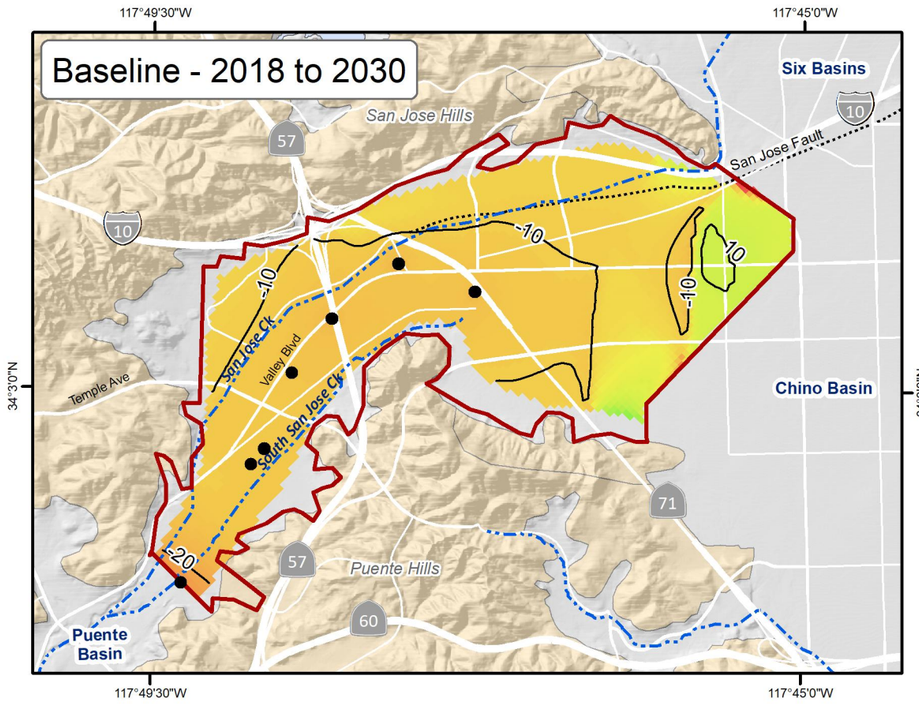
Basin Optimization Scenario 3

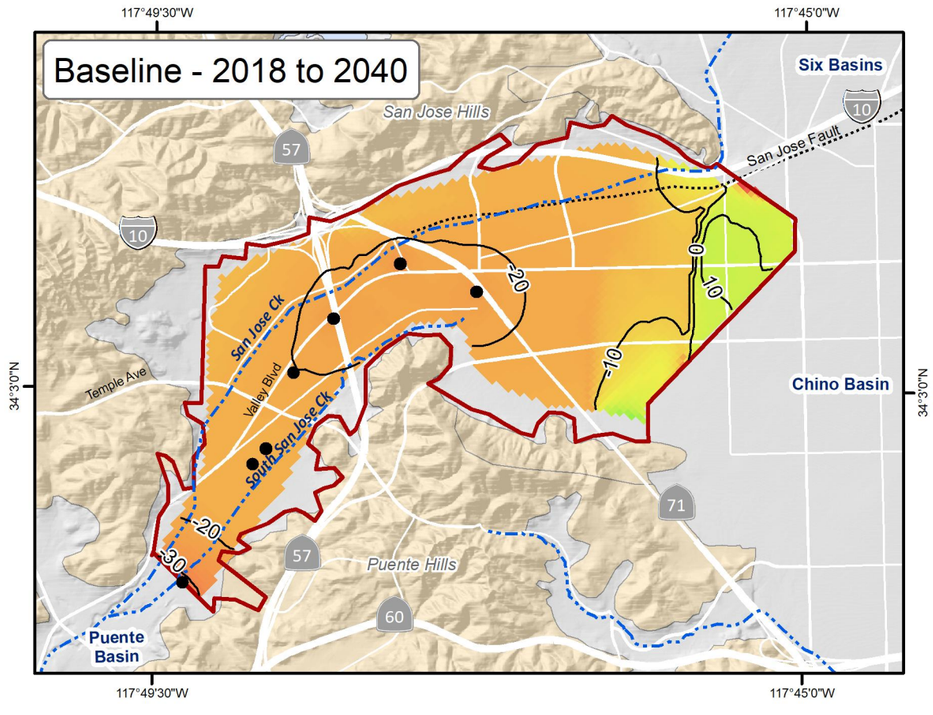
Figure 3-2d

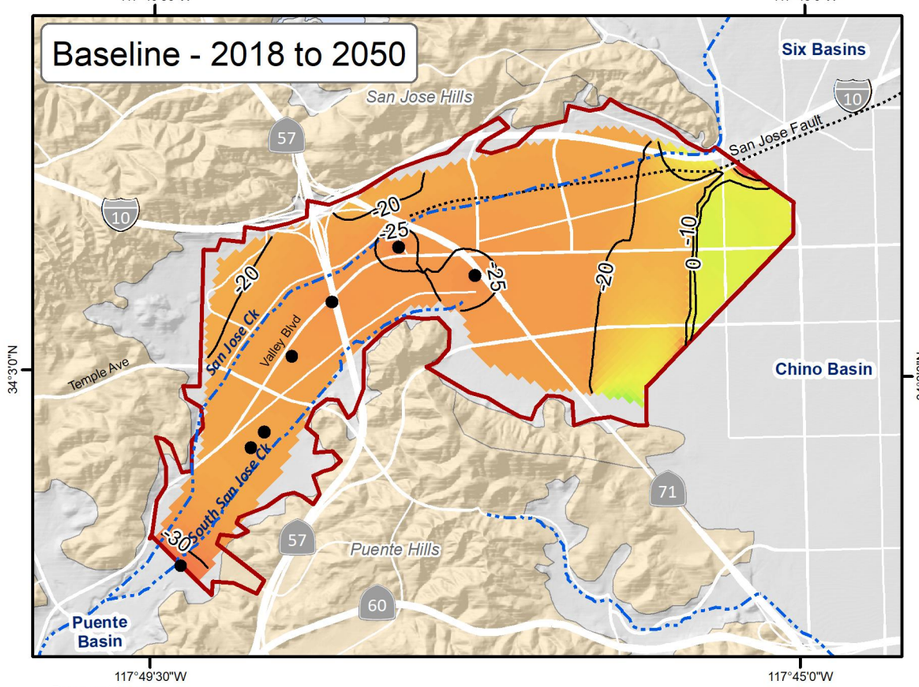
Figures 3-3a through 3-3d are maps showing the model-estimated change in groundwater elevation across the Spadra Basin for the Baseline Scenario and the three Basin Optimization Scenarios for the years: 2030, 2040, 2050, and 2079 (end of planning period). Groundwater elevation change is shown on each map as a color-ramped raster and contours of groundwater-elevation change. The maps also show the existing and planned pumping and recharge facilities included in each scenario.

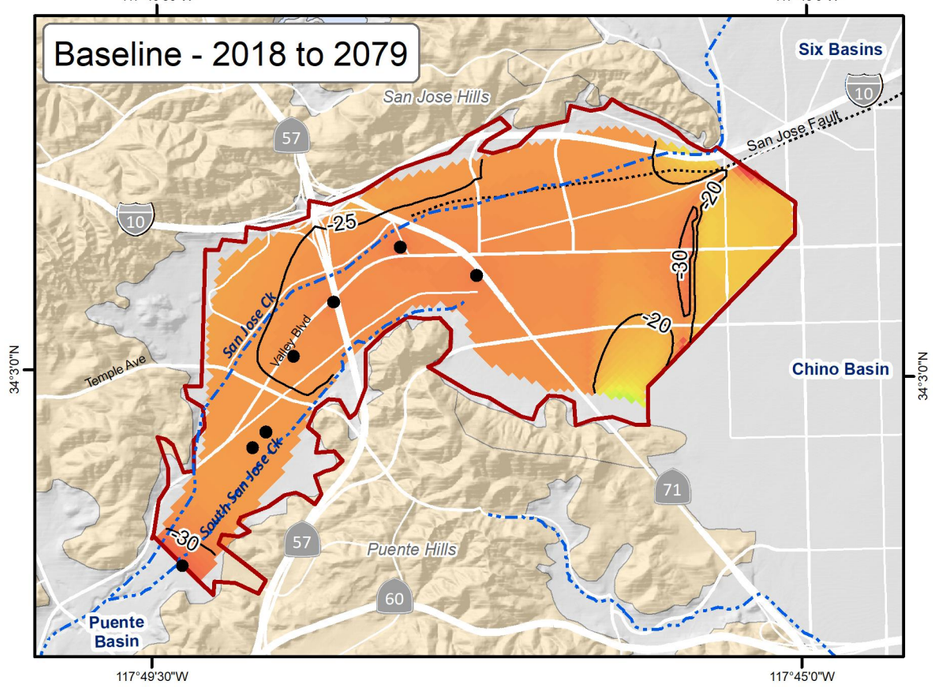
- In the **Baseline Scenario**, groundwater elevations are projected to decline across most of the basin by about 25 feet over the planning period.
- In **Basin Optimization Scenario 1**, groundwater elevations are projected to increase by up to 10 feet in the west, decrease by up to 10 feet in the center of the basin, and decrease by up to 30 feet in the east over the planning period.
- In **Basin Optimization Scenario 2**, groundwater elevations are projected to increase by up to 10 feet in the western and central portions of the basin and decrease by up to 20 feet in the east over the planning period.
- In **Basin Optimization Scenario 3**, groundwater elevations are projected to increase by up to 10 feet in the west, increase by up to 30 feet in the central portion of the basin, and decrease by up to 30 feet in the east over the planning period.

In all three Basin Optimization Scenarios, groundwater levels are projected to decline in the eastern portion of the basin. This is an area of highest uncertainty in the groundwater-flow model of the Spadra Basin (see TM 2), and hence, an area that should be monitored in the future for changes in groundwater levels and potential adverse impacts to the neighboring Chino Basin, such as reduced subsurface outflow. The Spadra Basin GSA is in the process of constructing a new monitoring well within the eastern portion of the basin near the Spadra/Chino Basin boundary. The data that will be collected from the new monitoring well includes: borehole lithology, borehole geophysics, depth to bottom of the aquifer, groundwater-quality data, and high-frequency groundwater-level data. The data collected from the new monitoring well, and additional monitoring data collected in the eastern portion of the basin, will be used to detect the potential adverse impacts and Undesirable Results, and also can be used to update and improve the groundwater model in the future.

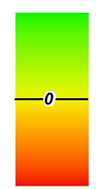








Groundwater Elevation Change



Pumping and Recharge Facilities

- Production Well Active in Baseline

- Streams & Flood Control Channels
- Spadra Basin (GSP Boundary)

Geology

Water-Bearing Sediments

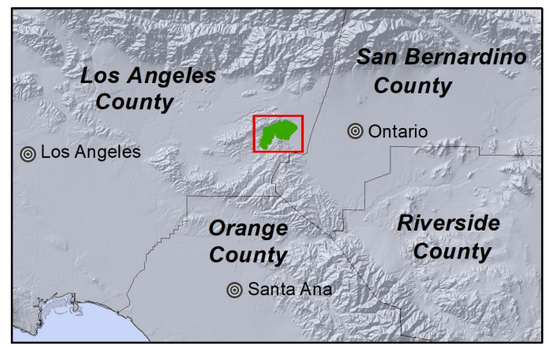
- Quaternary Alluvium

Consolidated Bedrock

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

Faults

- Location Certain
- Location Approximate
- Location Concealed
- Location Uncertain



Prepared by:

WEST YOST
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Author: AC
Date: 9/10/2021
File: Figure 3-3a_GWEL Change_BL.mxd

0 0.5 1 1.5 Miles

0 0.5 1 1.5 2 Kilometers

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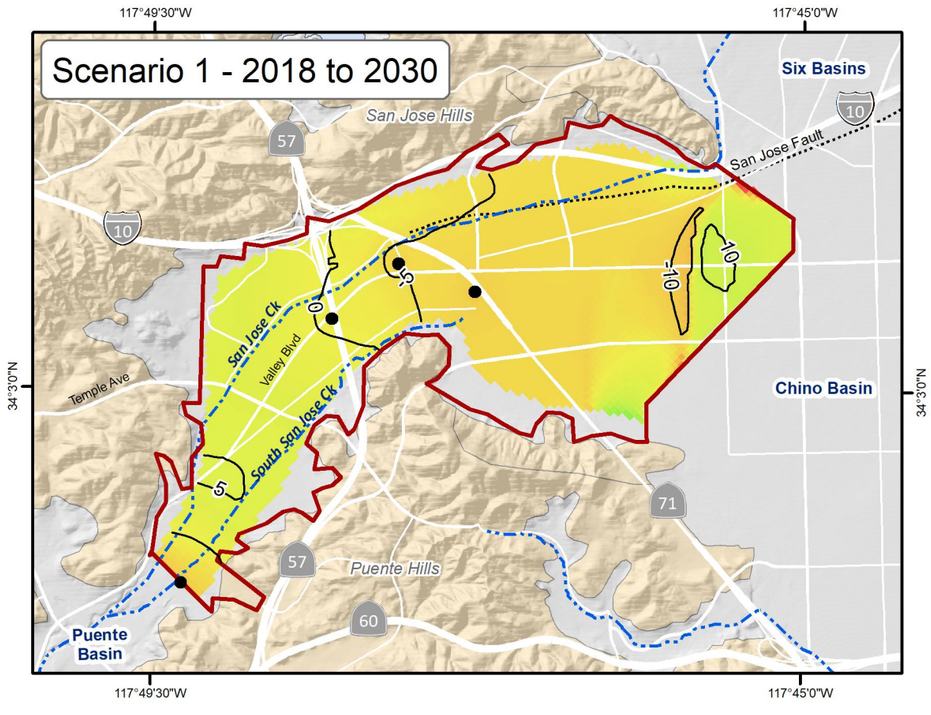
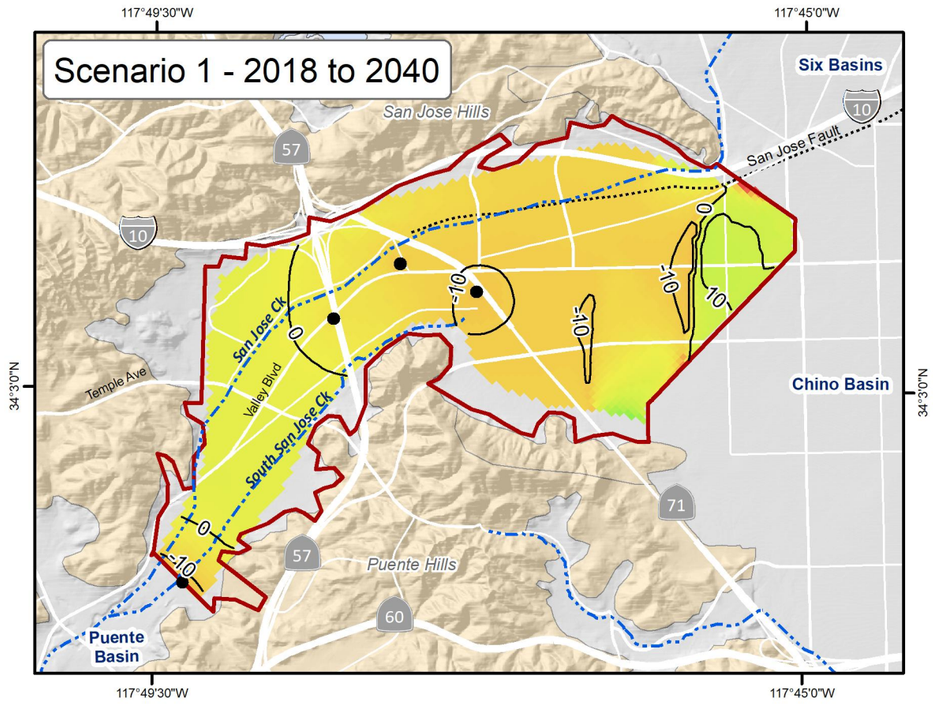
Groundwater Sustainability Plan

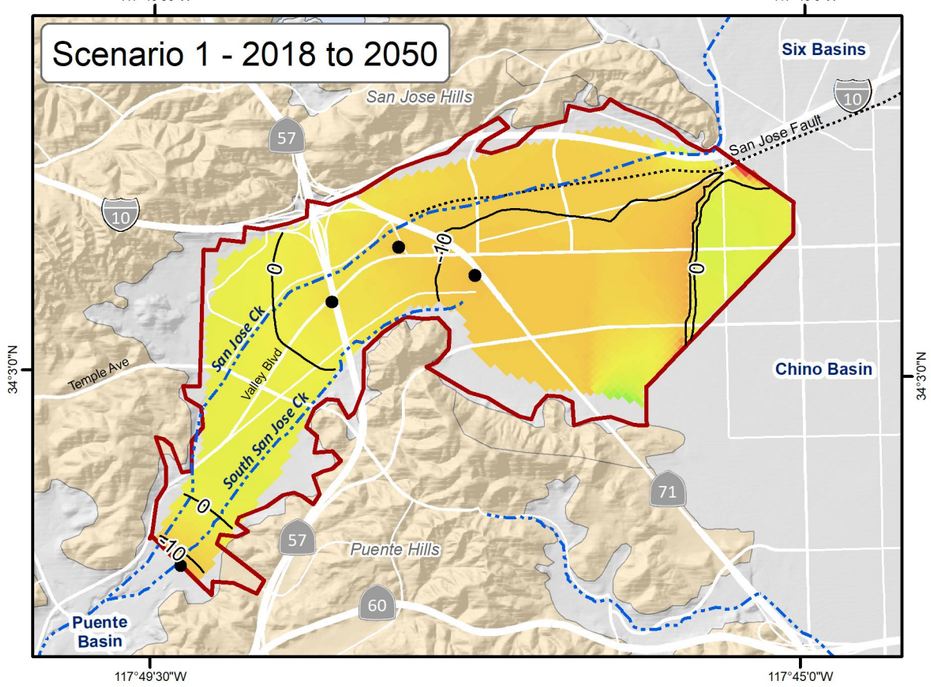
SPADRA BASIN GROUNDWATER SUSTAINABILITY AGENCY

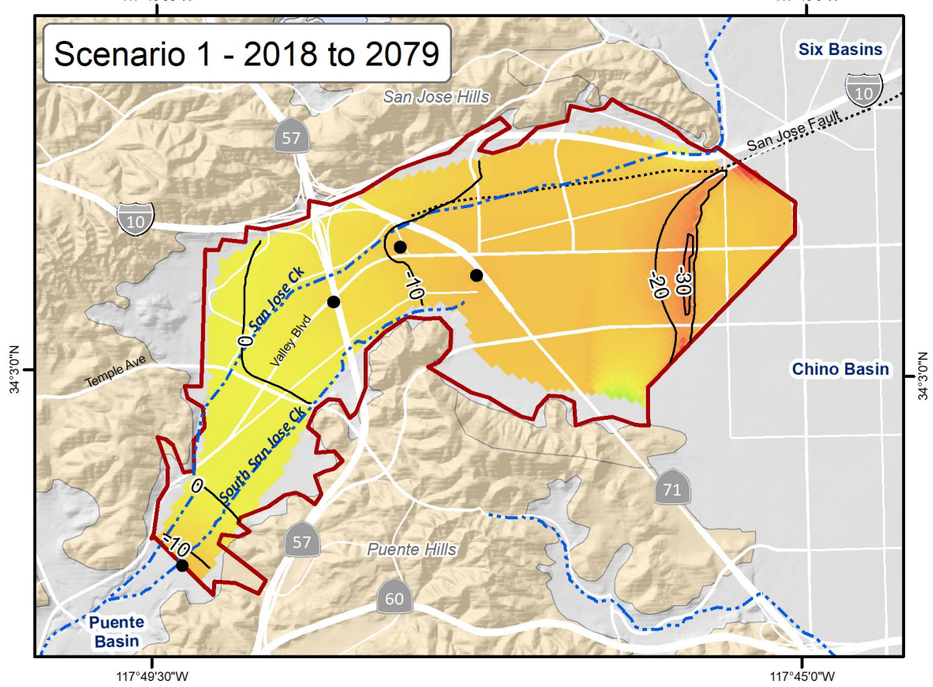
Change in Groundwater Elevation
Baseline Scenario

Figure 3-3a









Groundwater Elevation Change

40 ft

0

-40 ft

Pumping and Recharge Facilities

- Production Well Active in Scenario 1

Streams & Flood Control Channels

Spadra Basin (GSP Boundary)

Geology

Water-Bearing Sediments

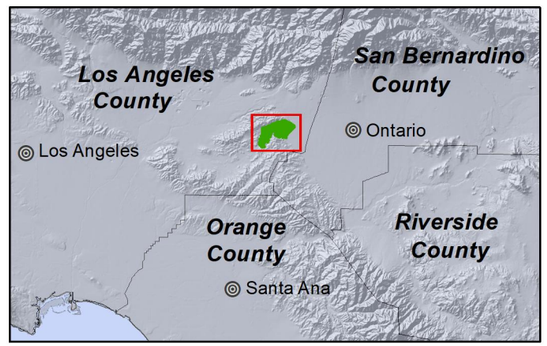
- Quaternary Alluvium

Consolidated Bedrock

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

Faults

- Location Certain
- Location Approximate
- Location Concealed
- Location Uncertain



Prepared by:

WEST YOST
Water. Engineered.

Author: AC
Date: 9/10/2021
File: Figure 3-3b_GWEL Change_S1.mxd

0 0.5 1 1.5 Miles

0 0.5 1 1.5 2 Kilometers

Prepared for:

Spadra Basin Groundwater Sustainability Agency

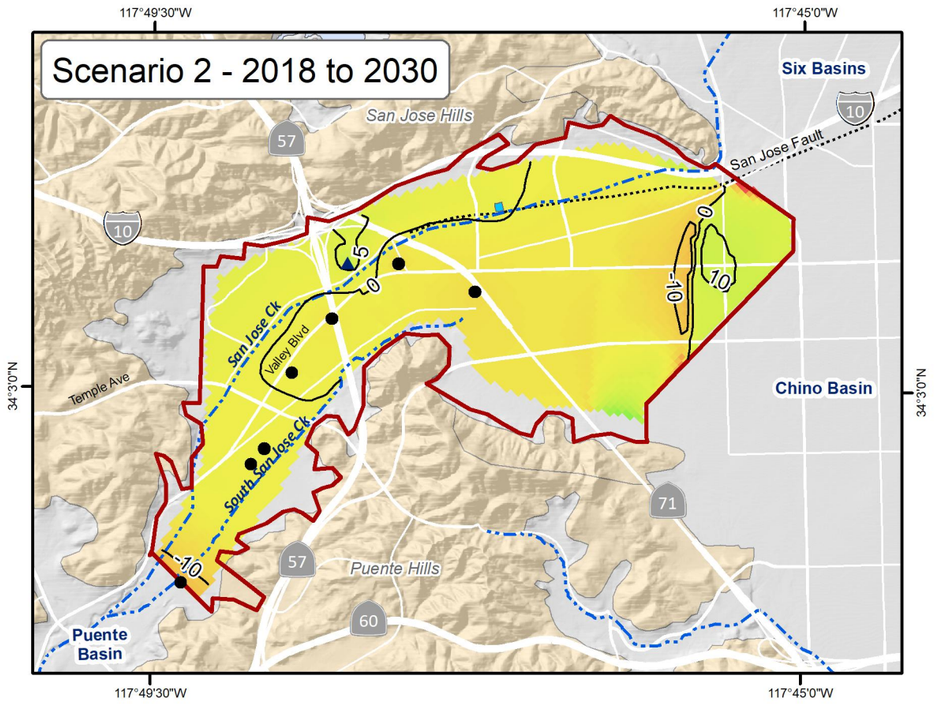
Groundwater Sustainability Plan

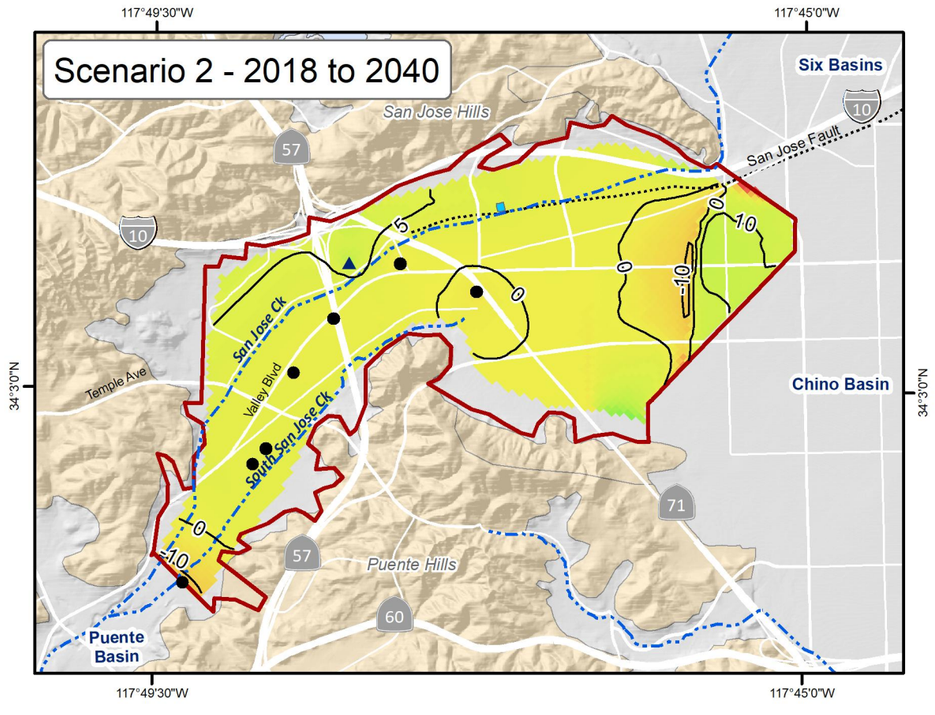
SPADRA BASIN GROUNDWATER SUSTAINABILITY AGENCY

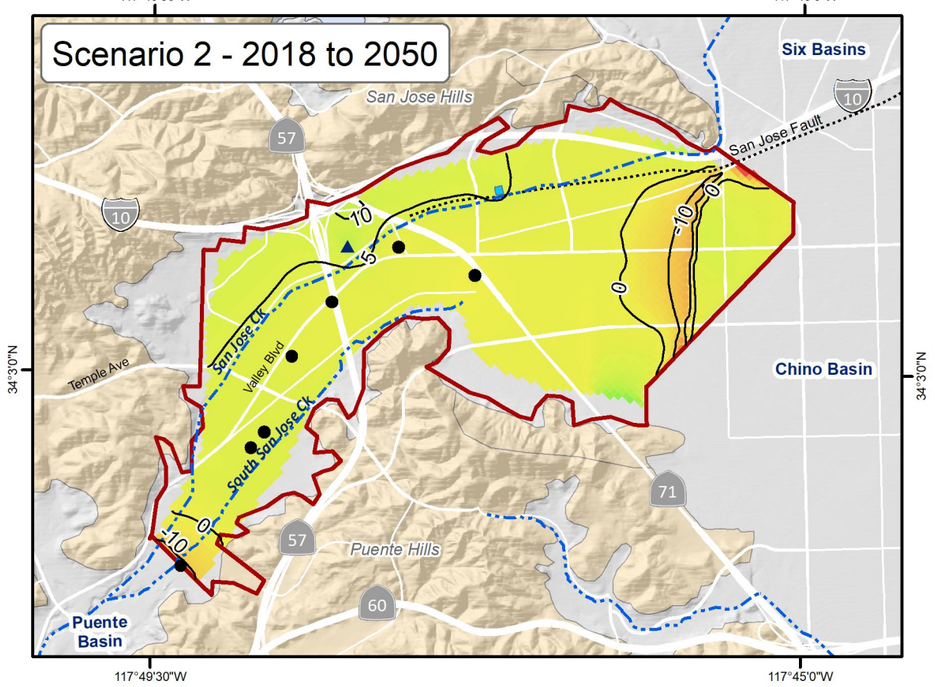
Change in Groundwater Elevation

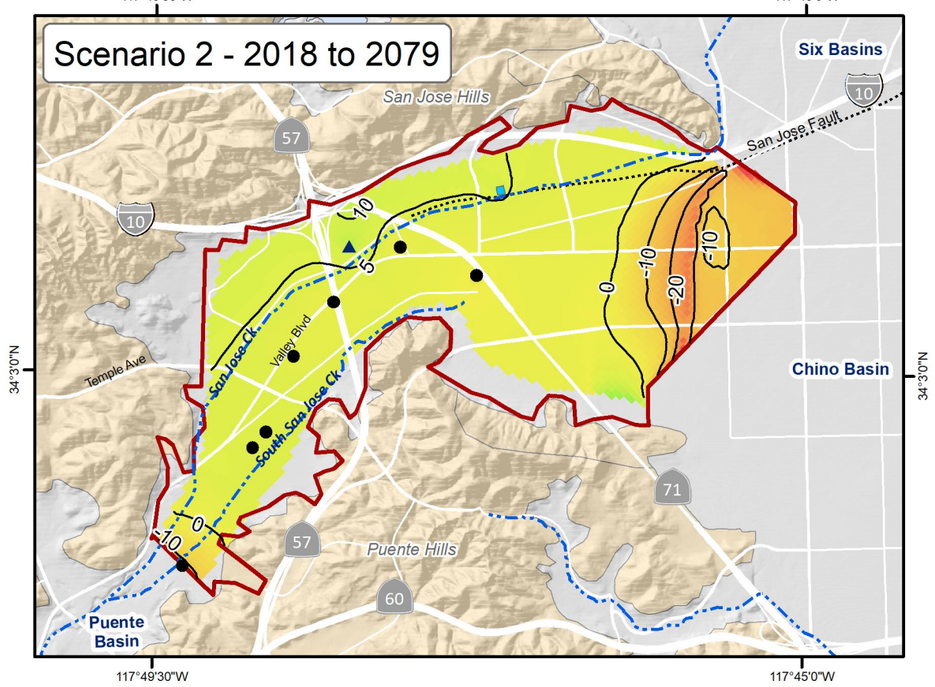
Basin Optimization Scenario 1

Figure 3-3b









Groundwater Elevation Change

40 ft

0

-40 ft

Pumping and Recharge Facilities

- Production Well Active in Scenario 2
- Underground Recharge Gallery in Scenario 2
- Injection Well in Scenario 2
- Streams & Flood Control Channels
- Spadra Basin (GSP Boundary)

Geology

Water-Bearing Sediments

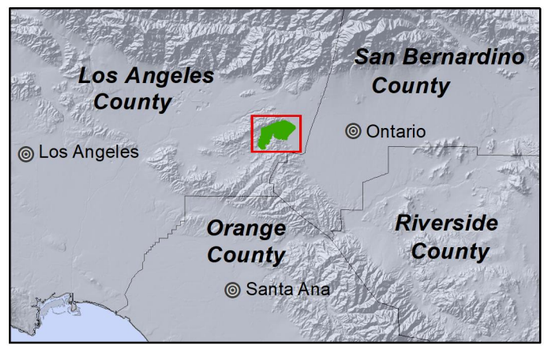
- Quaternary Alluvium

Consolidated Bedrock

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

Faults

- Location Certain
- Location Concealed
- Location Approximate
- Location Uncertain



Prepared by:

WEST YOST
Water. Engineered.

Author: AC
Date: 9/10/2021
File: Figure 3-3c_GWEL Change_S2.mxd

0 0.5 1 1.5 Miles

0 0.5 1 1.5 2 Kilometers

Prepared for:

Spadra Basin Groundwater Sustainability Agency

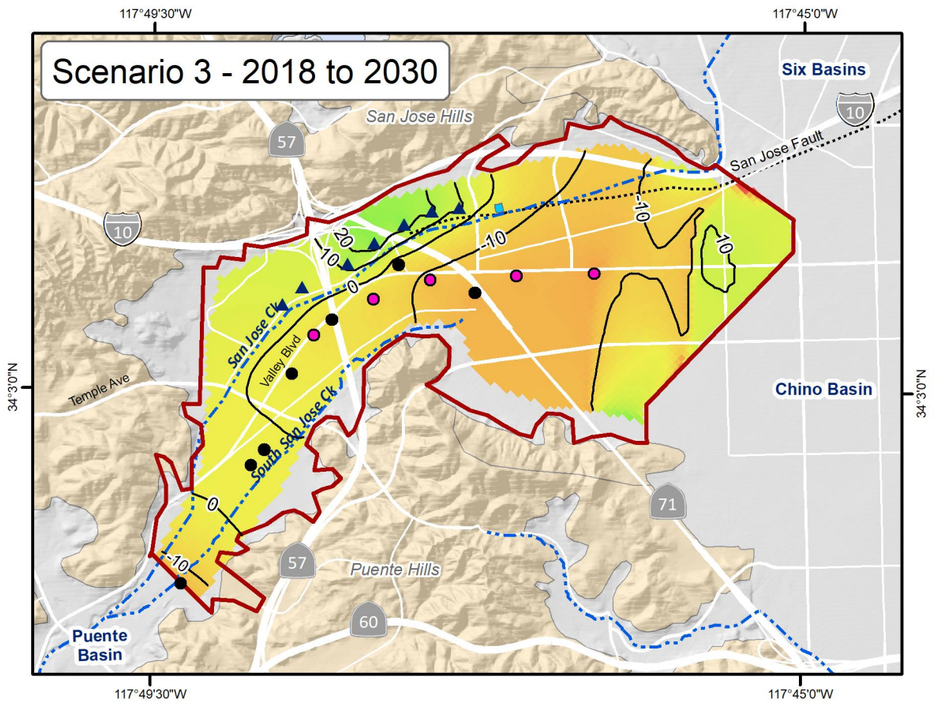
Groundwater Sustainability Plan

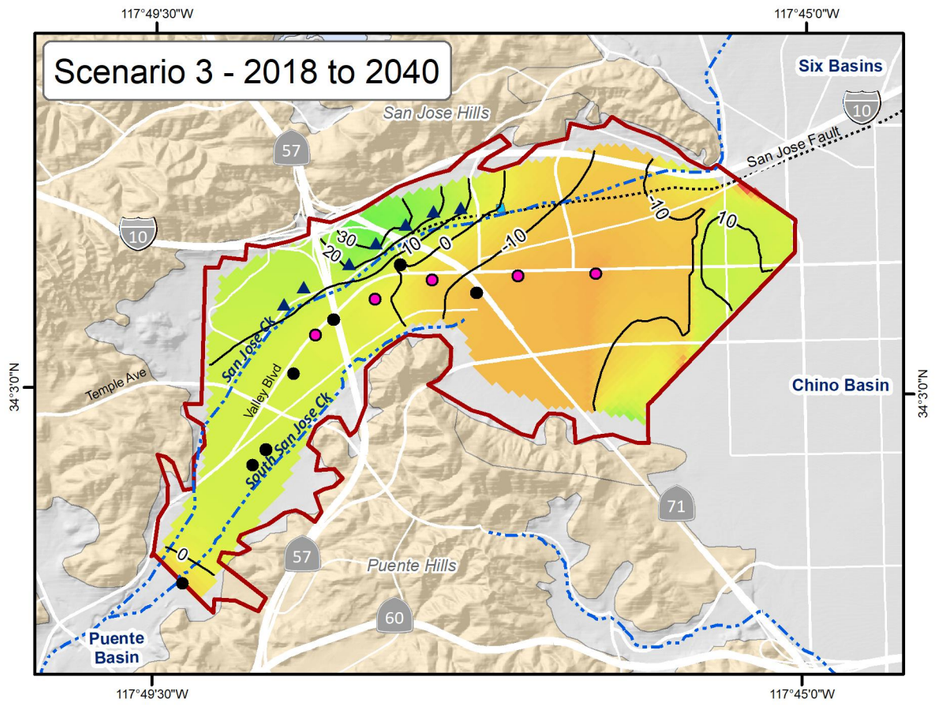
SPADRA BASIN GROUNDWATER SUSTAINABILITY AGENCY

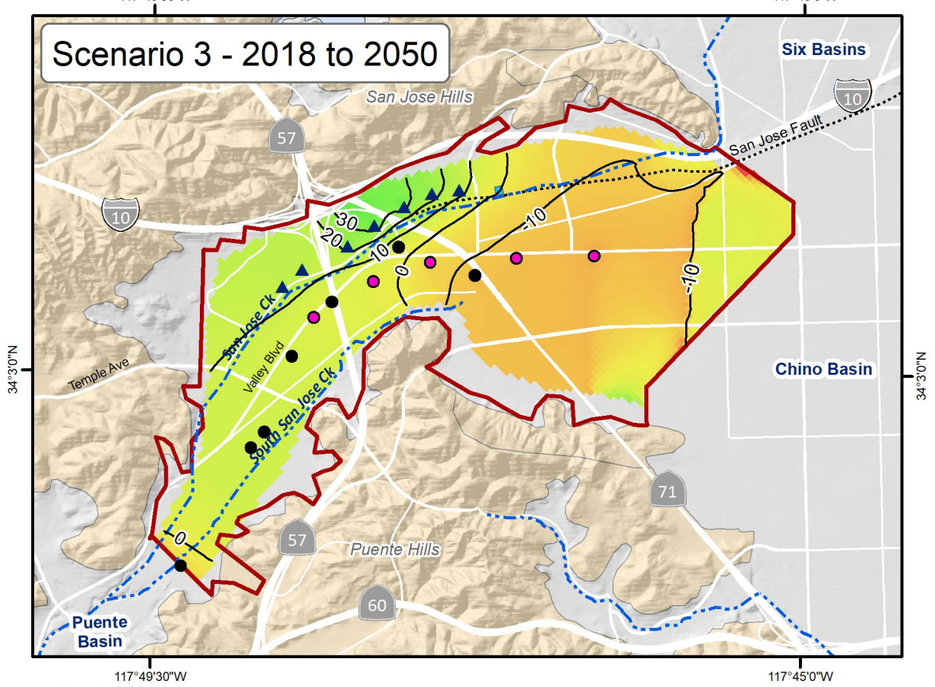
Change in Groundwater Elevation

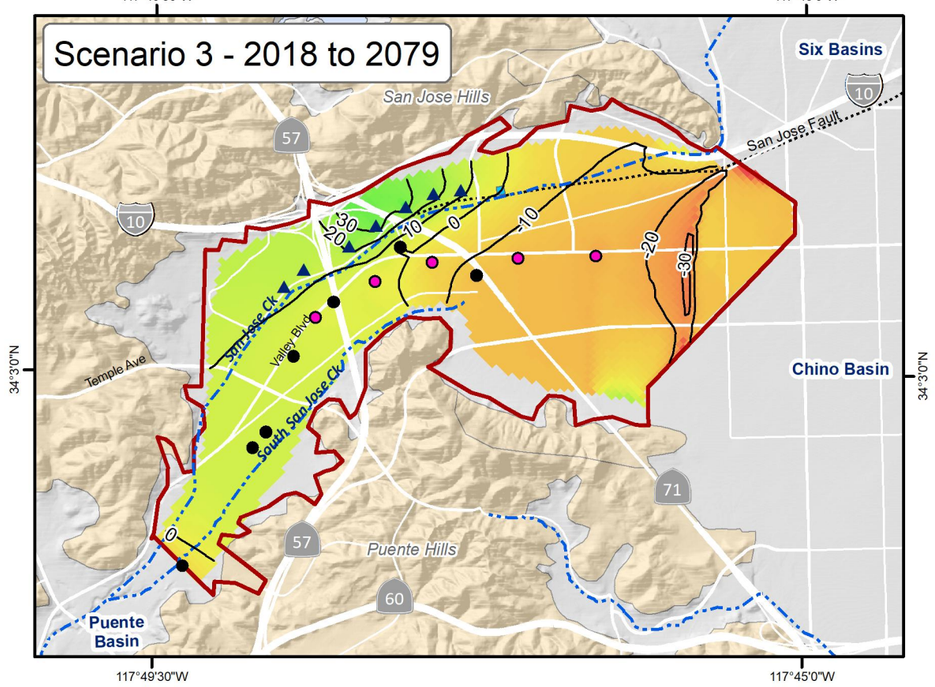
Basin Optimization Scenario 2

Figure 3-3c









Groundwater Elevation Change

40 ft

0

-40 ft

Pumping and Recharge Facilities

- Production Well Active in Scenario 1
- Underground Recharge Gallery in Scenario 3
- Injection Well in Scenario 3
- New Production Well in Scenario 3
- Streams & Flood Control Channels
- Spadra Basin (GSP Boundary)

Geology

Water-Bearing Sediments

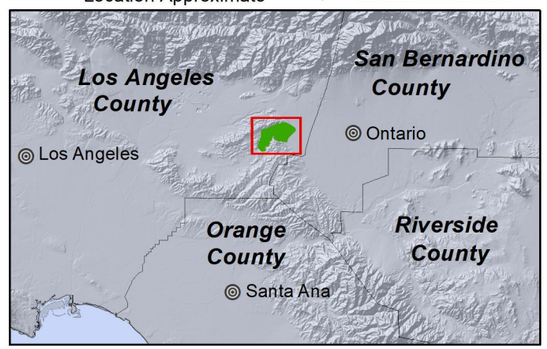
- Quaternary Alluvium

Consolidated Bedrock

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

Faults

- Location Certain
- Location Concealed
- Location Approximate
- Location Uncertain



Prepared by:

WEST YOST
Water. Engineered.

Author: AC
Date: 9/10/2021
File: Figure 3-3d_GWEL Change_S3.mxd

0 0.5 1 1.5 Miles

0 0.5 1 1.5 2 Kilometers

Prepared for:

Spadra Basin Groundwater Sustainability Agency
Groundwater Sustainability Plan

SPADRA BASIN GROUNDWATER SUSTAINABILITY AGENCY

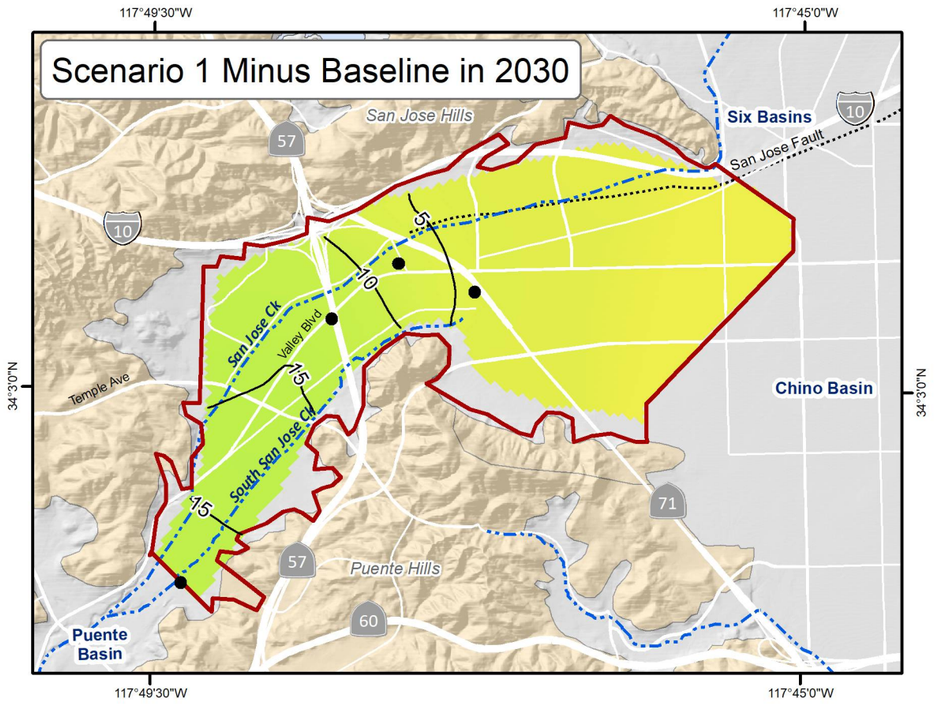
Change in Groundwater Elevation
Basin Optimization Scenario 3

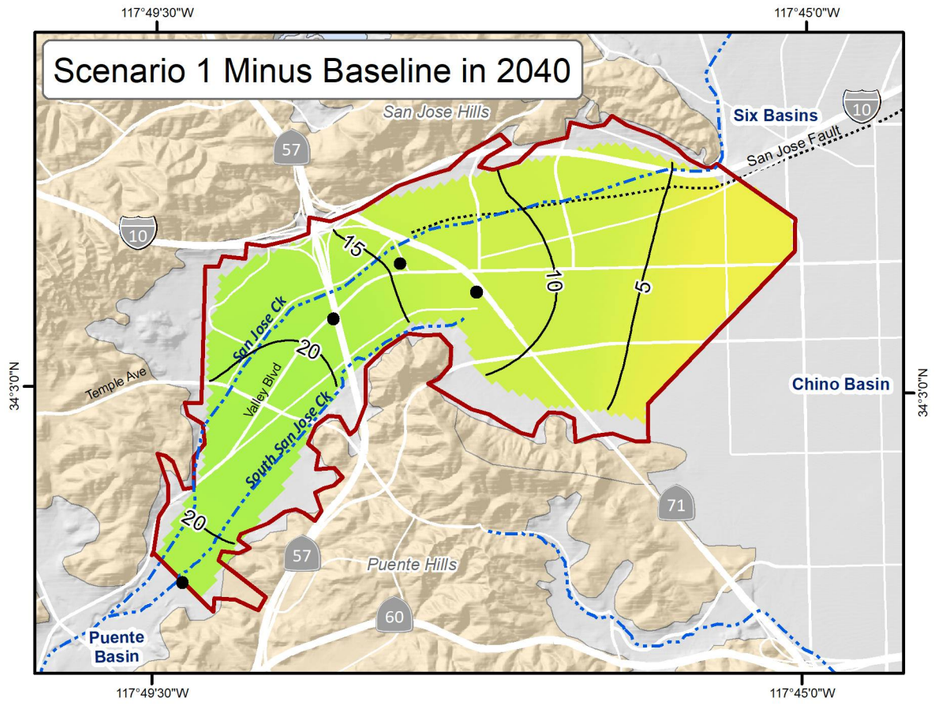
Figure 3-3d

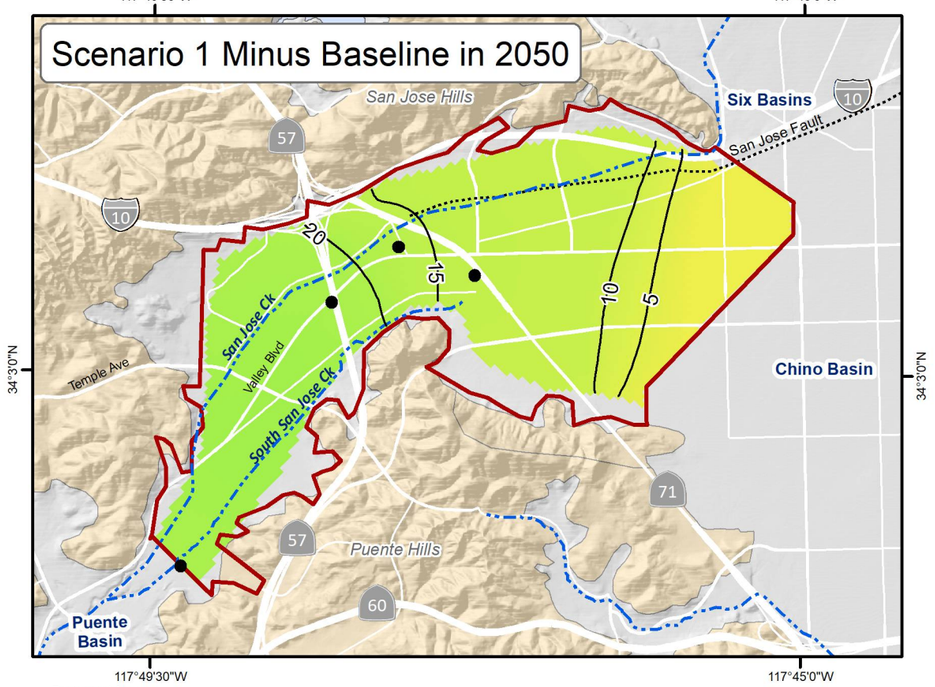
Figures 3-4a through 3-4c show the difference between the model-estimated groundwater elevations for the Baseline Scenario and the three Basin Optimization Scenarios for the years 2030, 2040, 2050, and 2079. The difference in groundwater elevation from the Baseline Scenario is shown on each map as a color-ramped raster and contours of groundwater-elevation difference. These maps show that by 2079 (end of the planning period) groundwater elevations are higher for all Basin Optimization Scenarios compared to the Baseline Scenario:

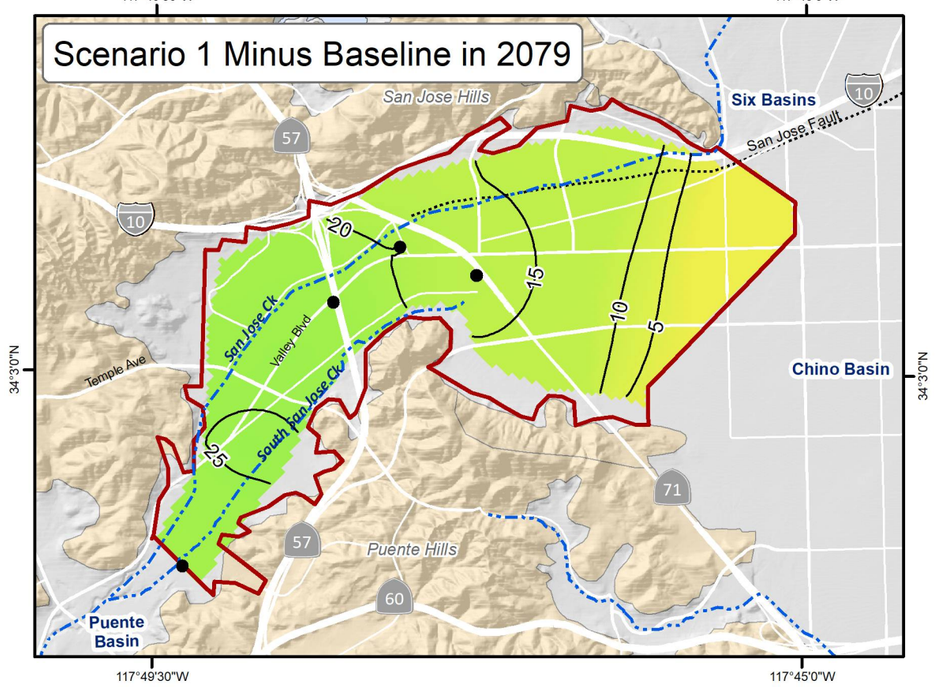
- In **Basin Optimization Scenario 1**, groundwater elevations across the basin are projected to be about 5 to 25 feet higher compared to the Baseline Scenario.
- In **Basin Optimization Scenario 2**, groundwater elevations across the basin are projected to be about 5 to 30 feet higher compared to the Baseline Scenario.
- In **Basin Optimization Scenario 3**, groundwater elevations across the basin are projected to be about 5 to 55 feet higher compared to the Baseline Scenario.

The greatest differences in groundwater elevations between the Basin Optimization Scenarios and the Baseline occur in the areas of the Spadra Basin where projects for either reduced pumping or artificial recharge are proposed. The greatest differences in groundwater elevations compared to the Baseline Scenario occur in the west for Basin Optimization Scenario 1; the central portion of the basin for Basin Optimization Scenario 2; and in the northern portion of the basin for Basin Optimization Scenario 3.









Groundwater Elevation Difference

40 ft

0

-40 ft

Pumping and Recharge Facilities

- Production Wells Active in Scenario 1
- Streams & Flood Control Channels
- Spadra Basin (GSP Boundary)

Geology

Water-Bearing Sediments

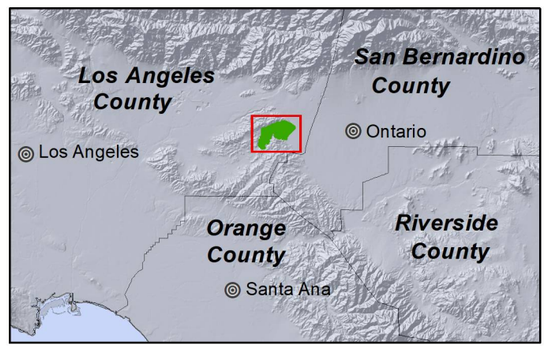
- Quaternary Alluvium

Consolidated Bedrock

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

Faults

- Location Certain
- Location Concealed
- Location Approximate
- Location Uncertain



Prepared by:

WEST YOST
Water. Engineered.

Author: AC
Date: 9/15/2021
File: Figure 3-4a_GWEL_Diff_BL_S1.mxd

0 0.5 1 1.5 Miles

0 0.5 1 1.5 2 Kilometers

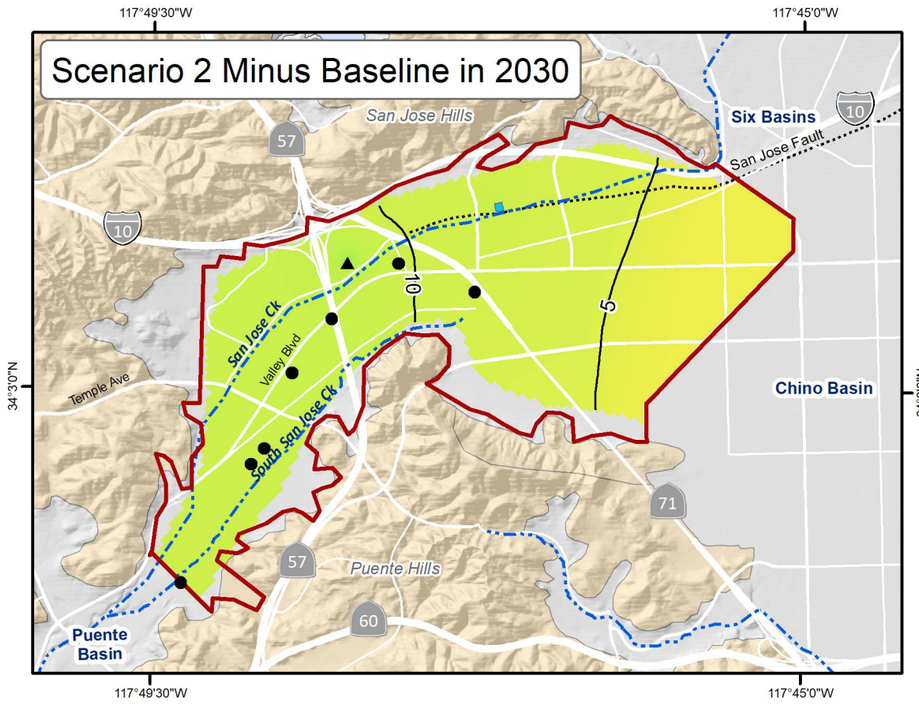
Prepared for:

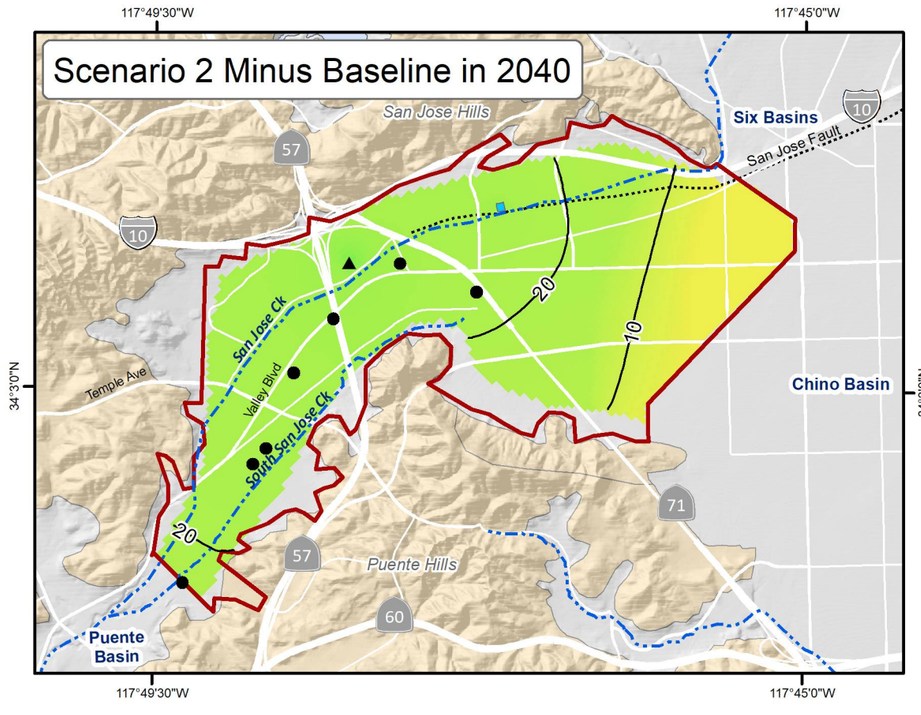
Spadra Basin Groundwater Sustainability Agency
Groundwater Sustainability Plan

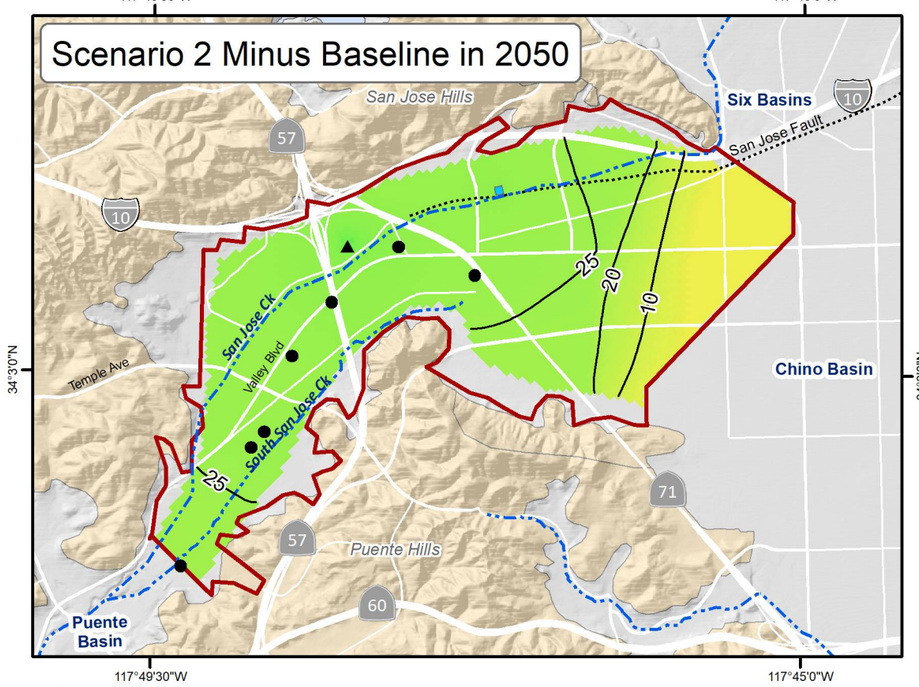
SPADRA BASIN GROUNDWATER SUSTAINABILITY AGENCY

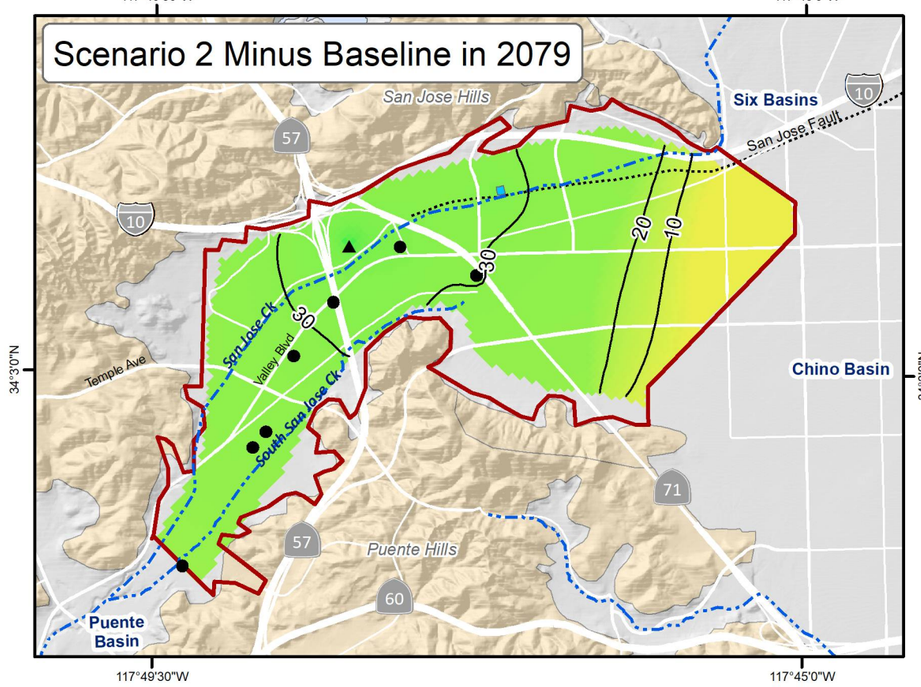
Difference in Groundwater Elevation
Basin Optimization Scenario 1

Figure 3-4a









Groundwater Elevation Difference

40 ft

0

-40 ft

Pumping and Recharge Facilities

- Production Wells Active in Scenario 2
- Underground Recharge Gallery in Scenario 2
- Injection Well in Scenario 2
- Streams & Flood Control Channels
- Spadra Basin (GSP Boundary)

Geology

Water-Bearing Sediments

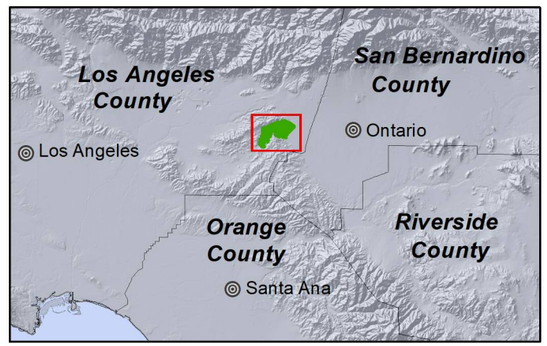
- Quaternary Alluvium

Consolidated Bedrock

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

Faults

- Location Certain
- Location Concealed
- Location Approximate
- Location Uncertain



Prepared by:

WEST YOST
Water. Engineered.

Author: AC
Date: 9/15/2021
File: Figure 3-4b_GWEL_Diff_BL_S2.mxd

0 0.5 1 1.5 Miles

0 0.5 1 1.5 2 Kilometers

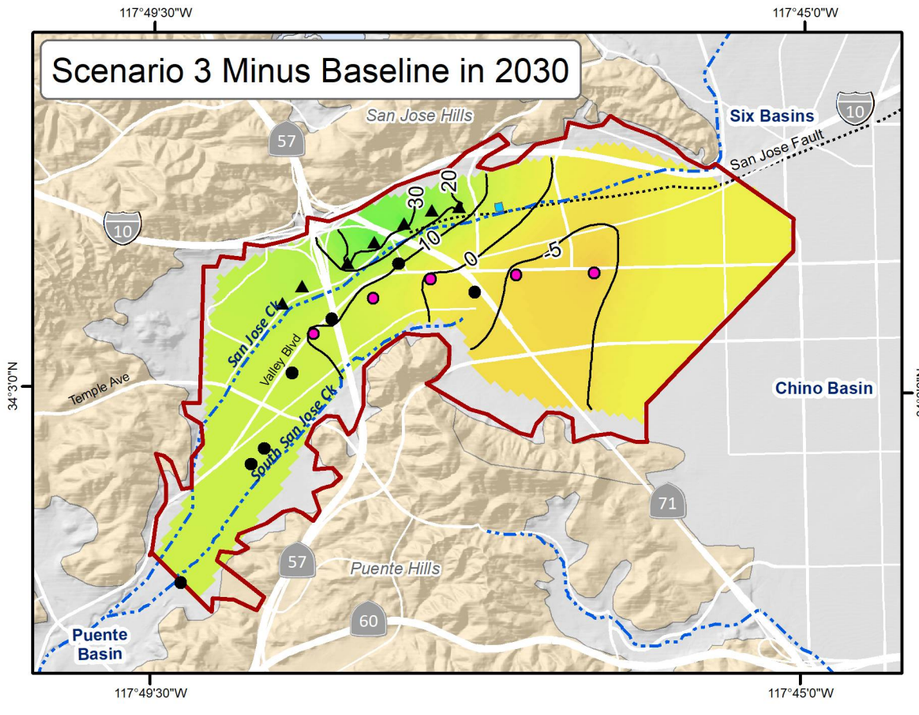
Prepared for:

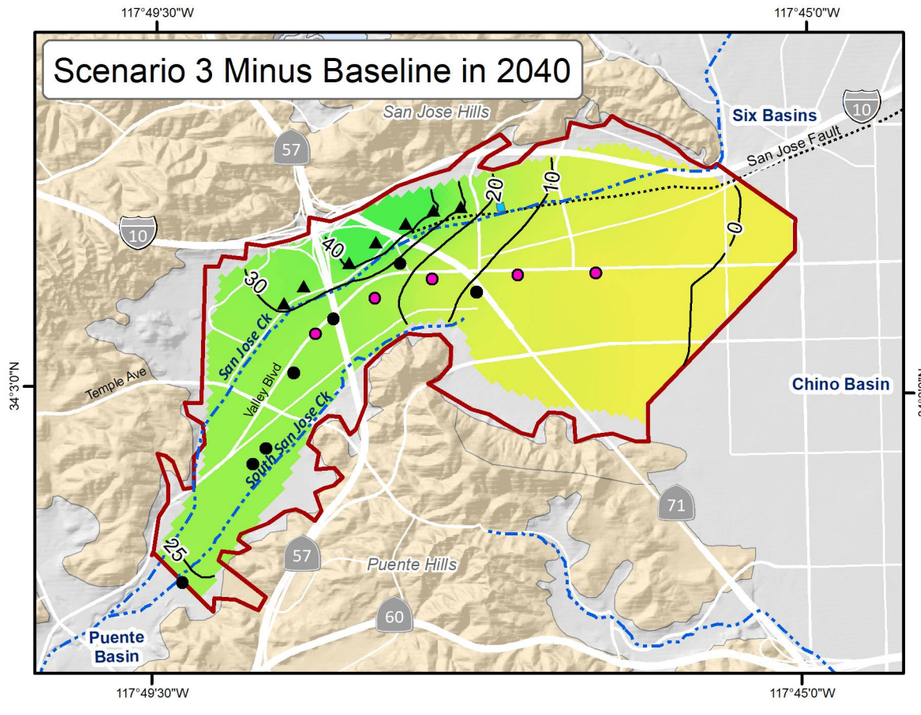
Spadra Basin Groundwater Sustainability Agency
Groundwater Sustainability Plan

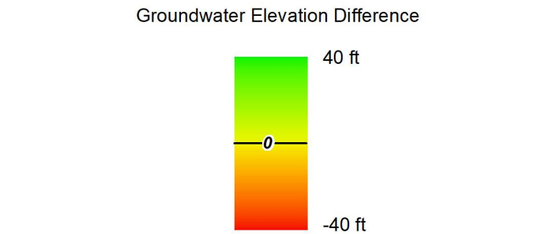
SPADRA BASIN GROUNDWATER SUSTAINABILITY AGENCY

Difference in Groundwater Elevation
Basin Optimization Scenario 2

Figure 3-4b

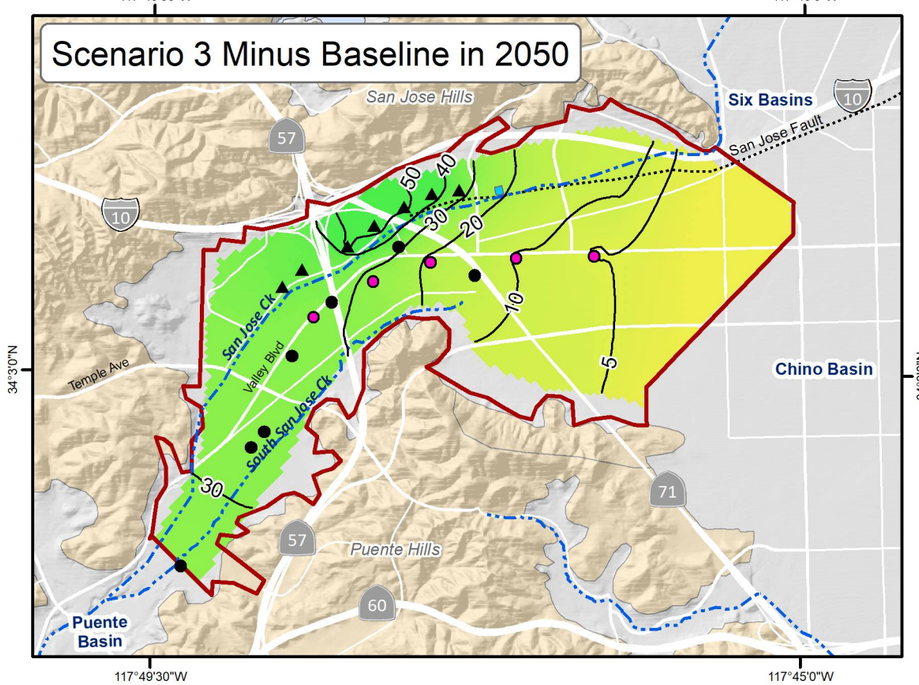


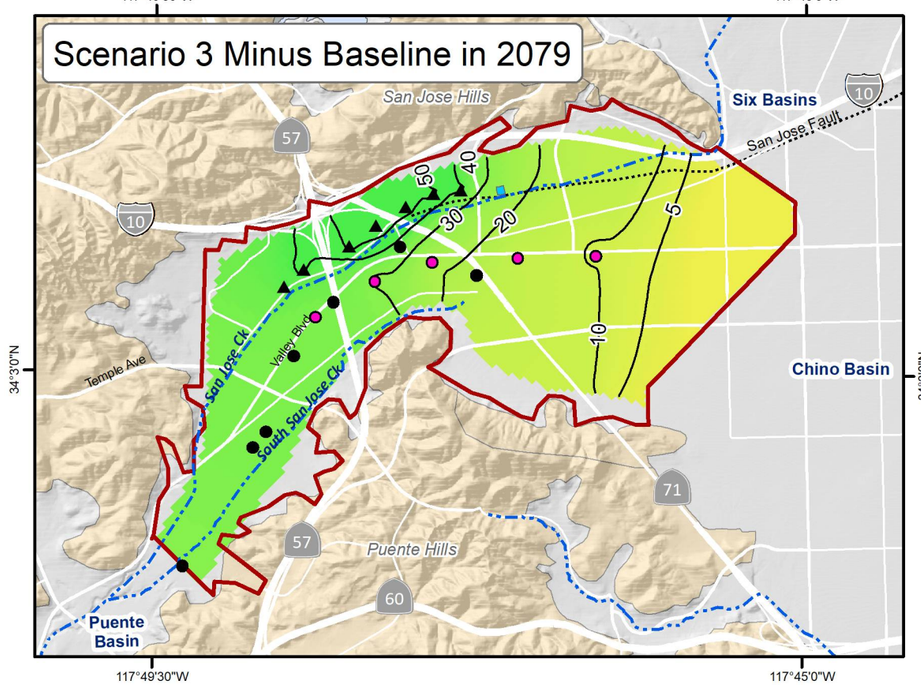




Pumping and Recharge Facilities

- Production Wells Active in Scenario 3
- Underground Recharge Gallery in Scenario 3
- Injection Wells in Scenario 3
- New Production Wells in Scenario 3
- Streams & Flood Control Channels
- Spadra Basin (GSP Boundary)





Geology

Water-Bearing Sediments

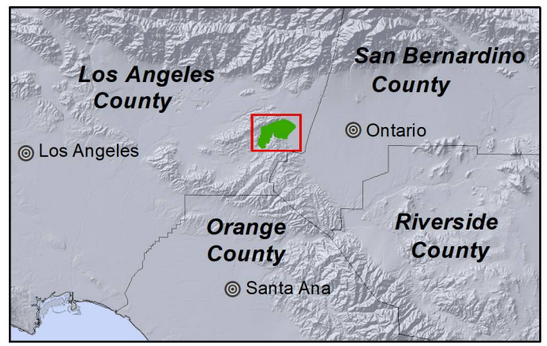
- Quaternary Alluvium

Consolidated Bedrock

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

Faults

- Location Certain
- Location Concealed
- Location Approximate
- Location Uncertain



Prepared by:

WEST YOST
Water. Engineered.

Author: AC
Date: 9/15/2021
File: Figure 3-4c_GWEL_Diff_BL_S3.mxd

0 0.5 1 1.5 Miles
0 0.5 1 1.5 2 Kilometers

Prepared for:

Spadra Basin Groundwater Sustainability Agency
Groundwater Sustainability Plan

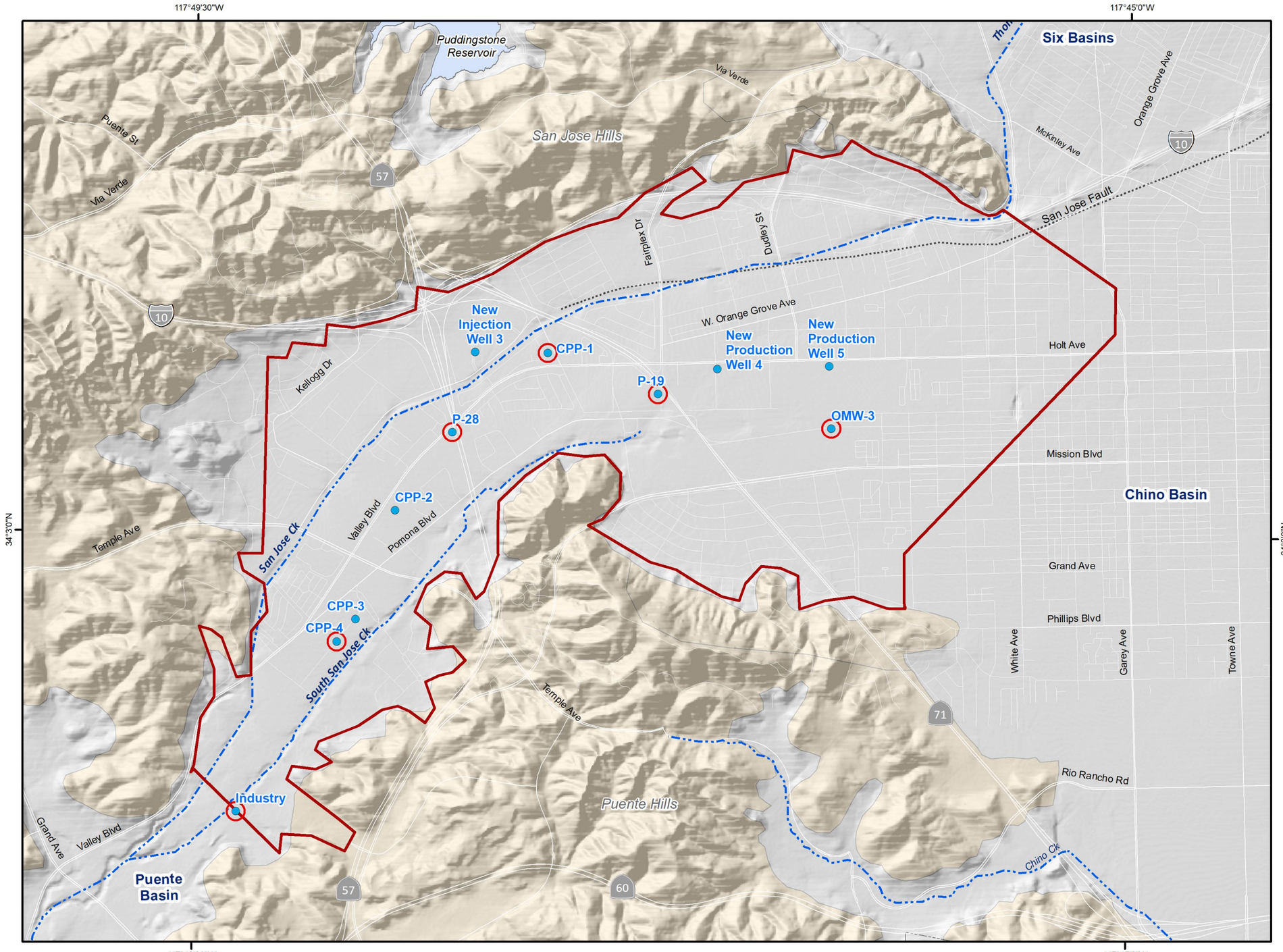
SPADRA BASIN GROUNDWATER SUSTAINABILITY AGENCY

Difference in Groundwater Elevation
Basin Optimization Scenario 3

Figure 3-4c

Groundwater Elevations at Wells

Figure 3-5 shows the locations of eleven wells across the Spadra Basin where time series of model-predicted groundwater elevations were analyzed to evaluate the change in water levels over the planning period and the sustainability of the Basin Optimization Scenarios. Figures 3-6a through 3-6k are time series charts of the historical and projected groundwater elevations for the three Basin Optimization Scenarios compared to the Baseline Scenario for the eleven wells. The wells include all active municipal pumping wells and/or representative monitoring wells where Sustainable Management Criteria were established in TM 3, two proposed pumping well locations in Basin Optimization Scenario 3, and one proposed injection well location in Basin Optimization Scenarios 2 and 3. For the wells that are representative monitoring locations with Sustainable Management Criteria, the Minimum Thresholds and Measurable Objectives are shown on the time-series charts.



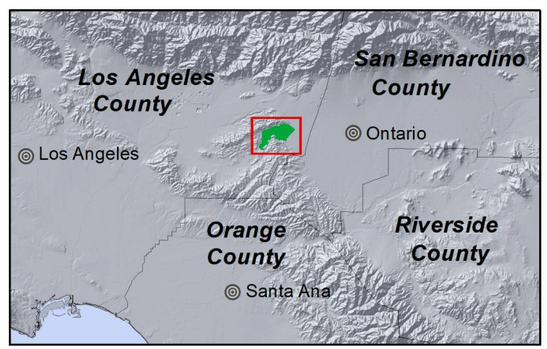
Well with Time Series of Model-Predicted Groundwater Elevations in Figures 3-6a through 3-6k

Representative Monitoring Well with Sustainable Management Criteria for Groundwater Levels

10 Groundwater-Elevation Change Contours (ft)

Streams & Flood Control Channels

Spadra Basin (GSP Boundary)



Prepared by:

WEST YOST
Water. Engineered.

Author: VMW
Date: 9/22/2021
File: Figure 3-5_TS_GWEL.mxd

0 0.5 1 1.5 Miles

0 0.5 1 1.5 2 Kilometers

Prepared for:

Spadra Basin Groundwater Sustainability Agency

Groundwater Sustainability Plan

SPADRA BASIN GROUNDWATER SUSTAINABILITY AGENCY

Well with Time Series of Model-Predicted Groundwater Elevations

Figure 3-5

Figure 3-6a. Historical and Projected Groundwater Elevations for Baseline and Basin Optimization Scenarios at Industry

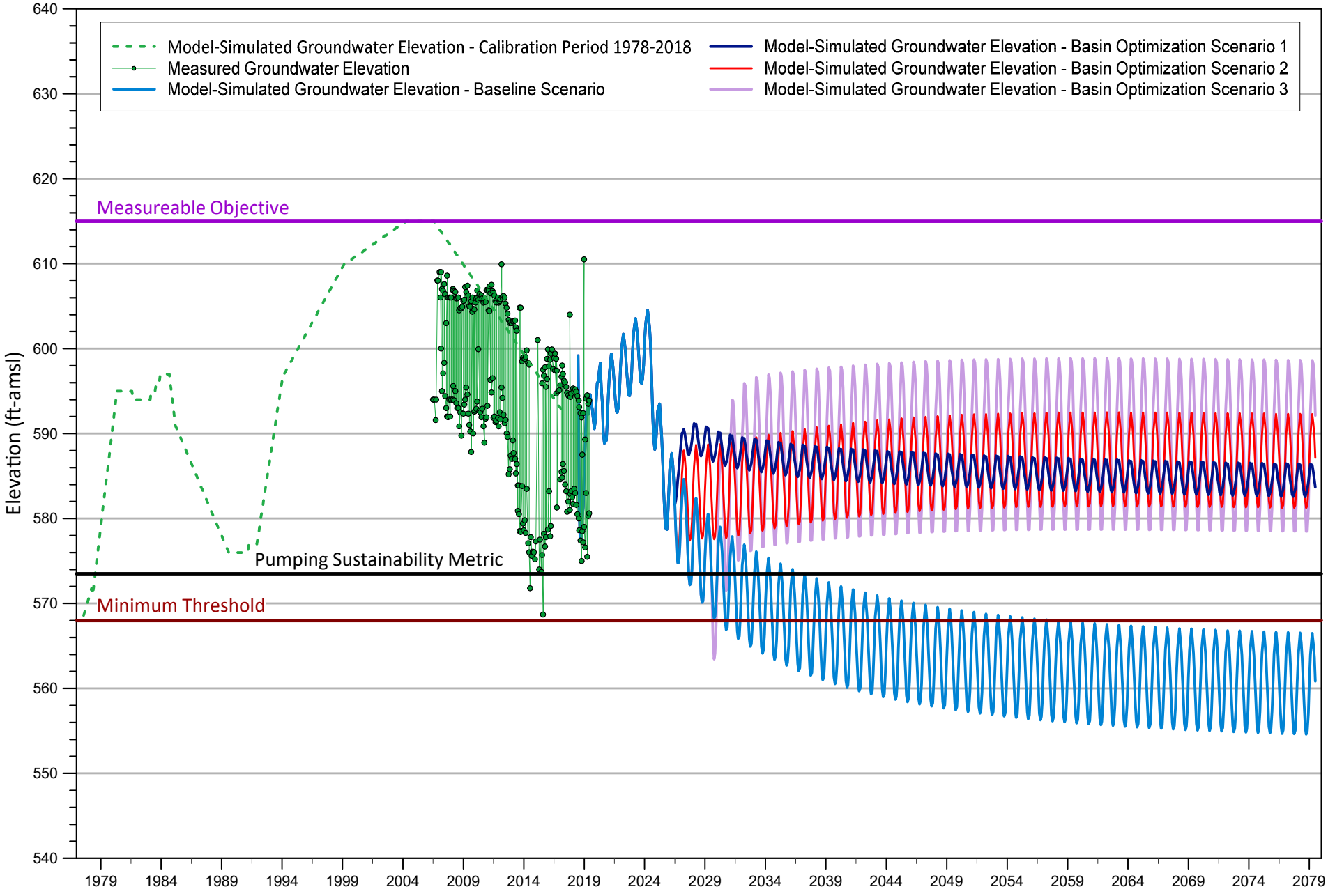


Figure 3-6b. Historical and Projected Groundwater Elevations for Baseline and Basin Optimization Scenarios at CPP-4

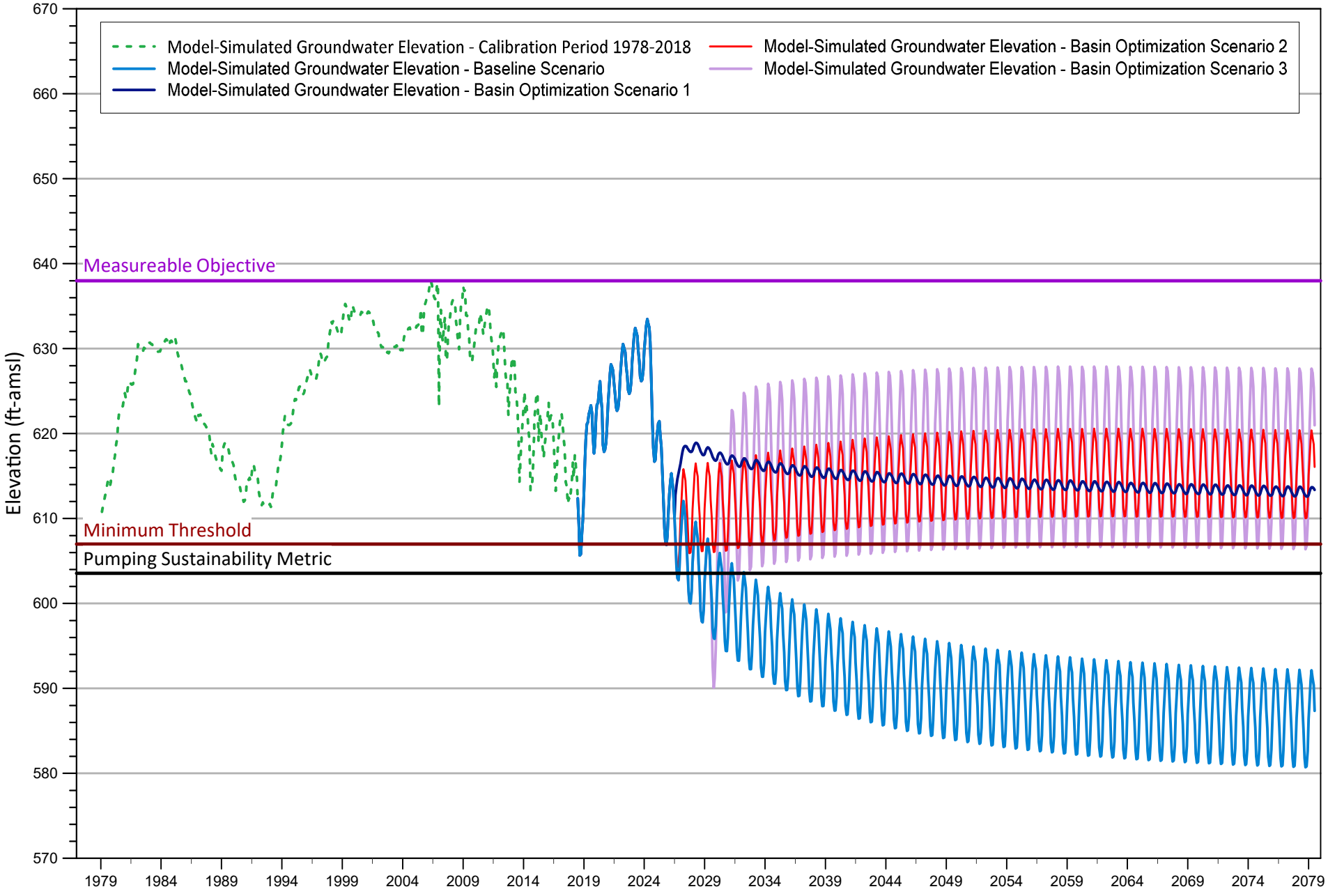


Figure 3-6c. Historical and Projected Groundwater Elevations for Baseline and Basin Optimization Scenarios at CPP-3

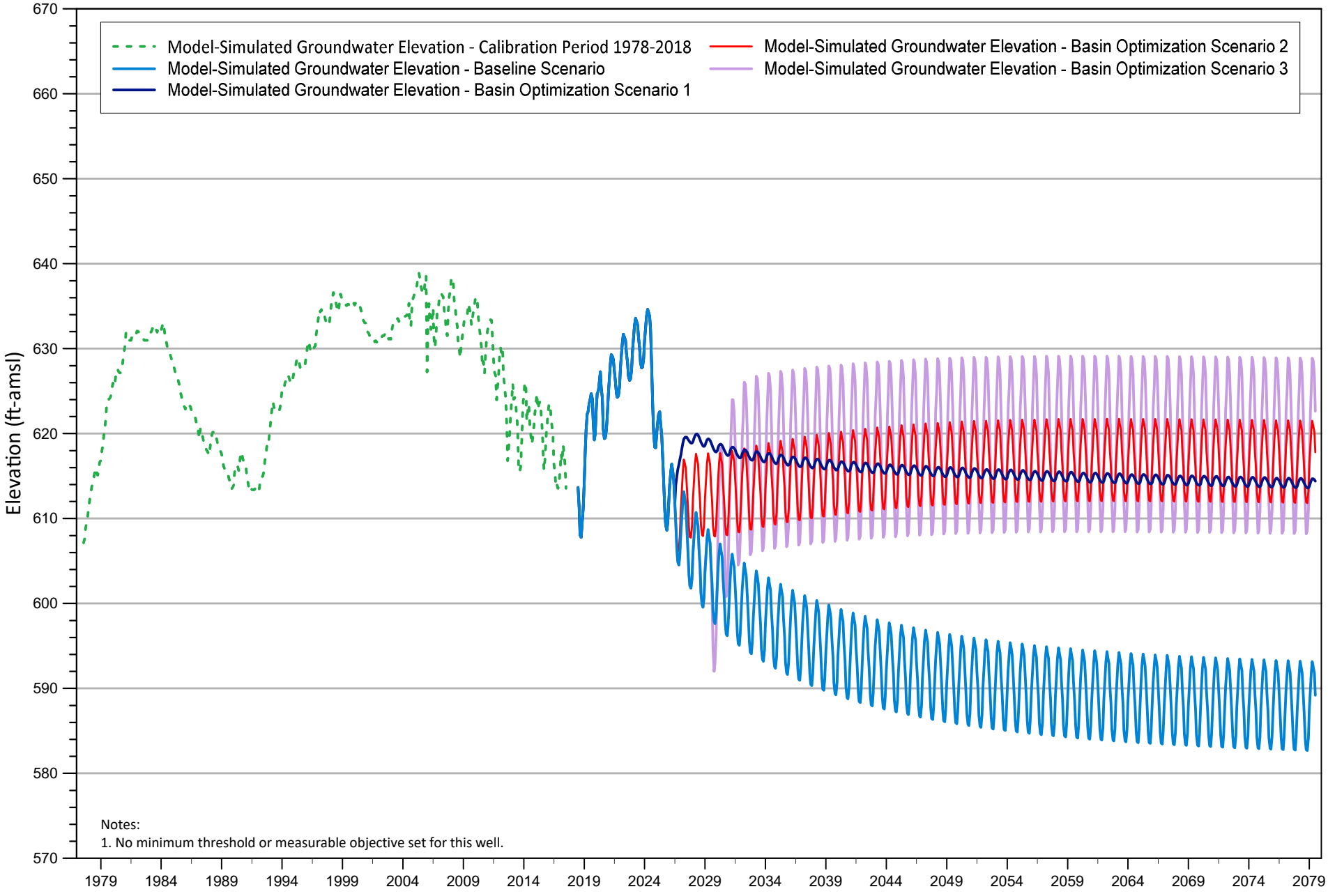


Figure 3-6d. Historical and Projected Groundwater Elevations for Baseline and Basin Optimization Scenarios at CPP-2

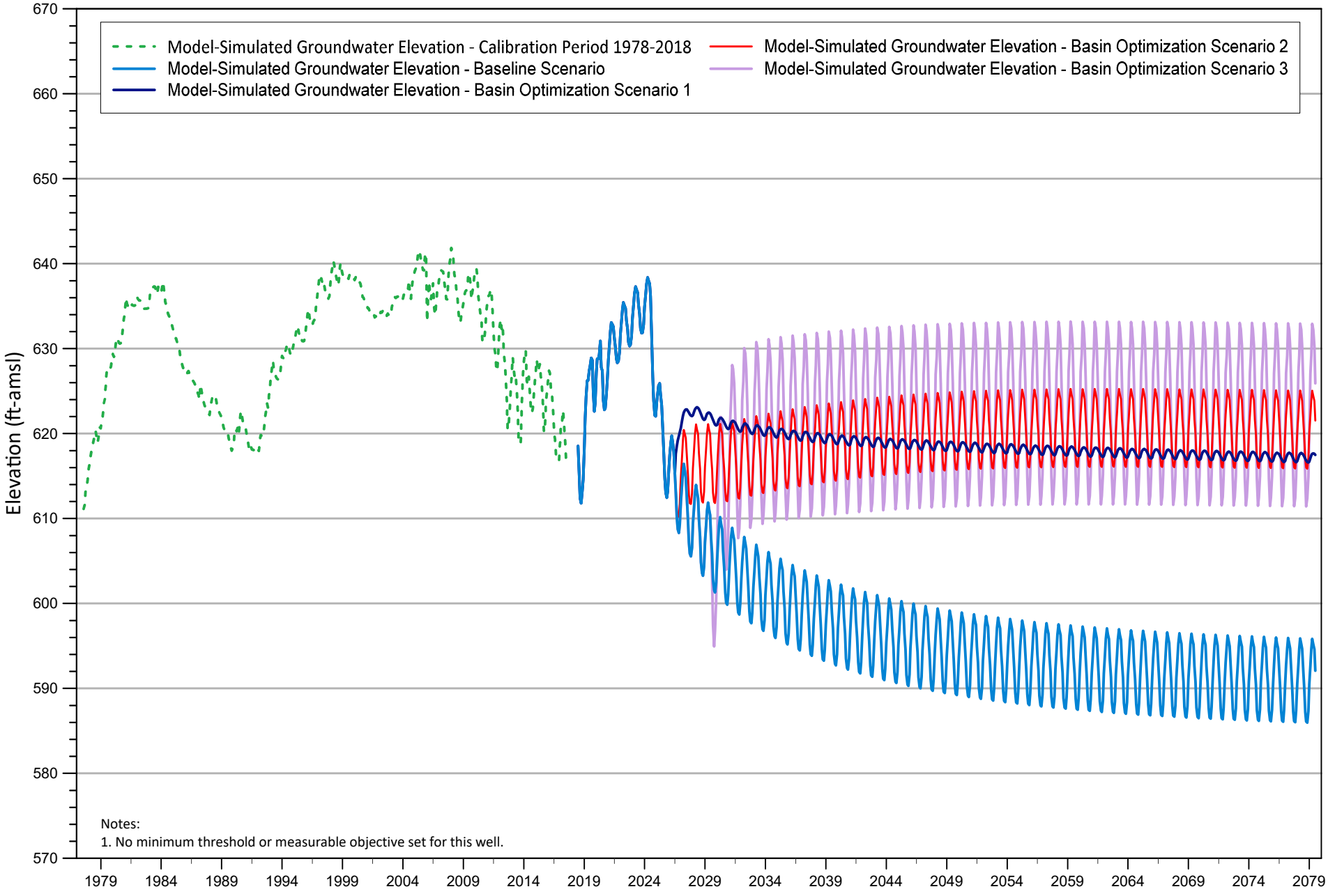


Figure 3-6e. Historical and Projected Groundwater Elevations for Baseline and Basin Optimization Scenarios at P-28

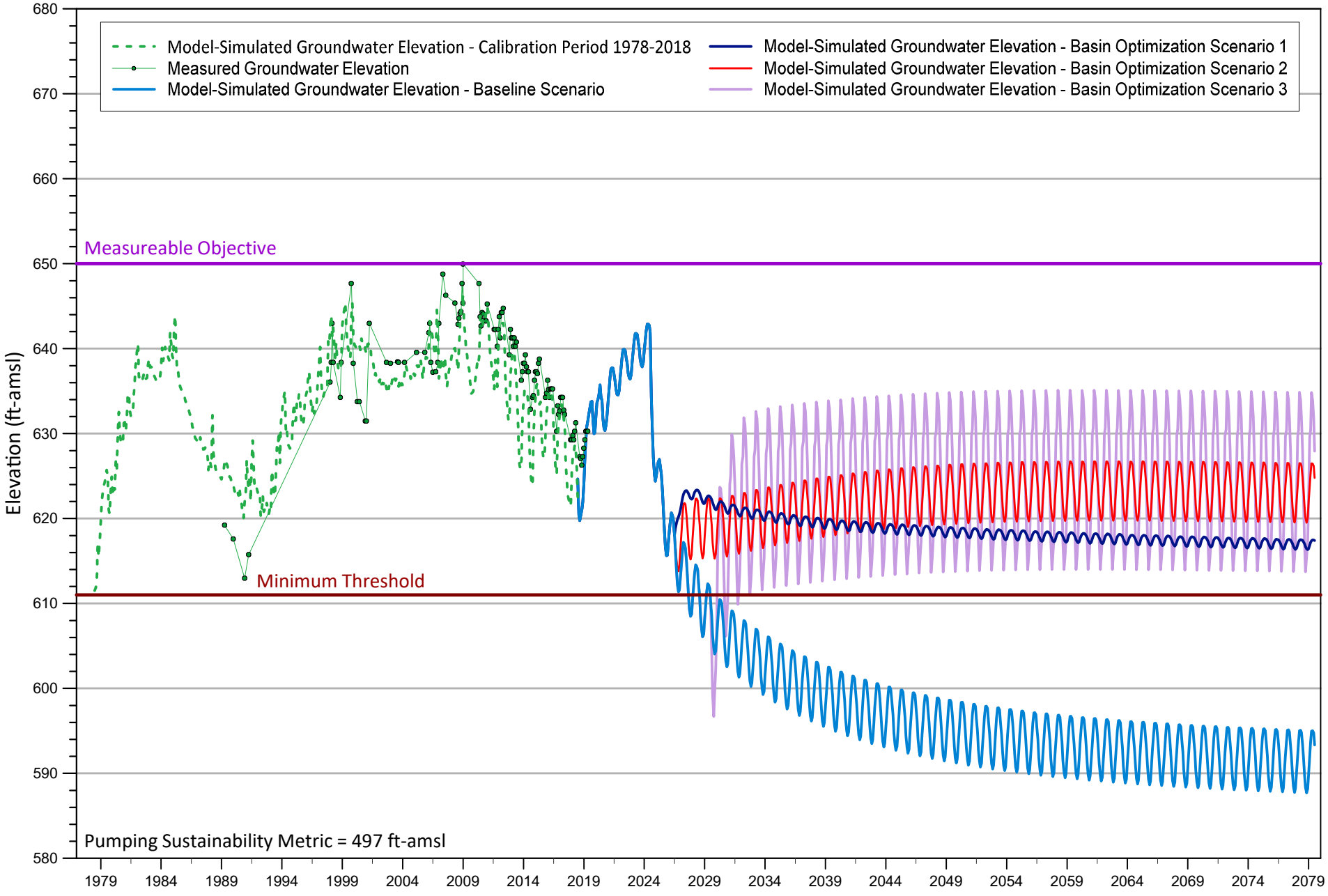


Figure 3-6f. Historical and Projected Groundwater Elevations for Baseline and Basin Optimization Scenarios at CPP-1

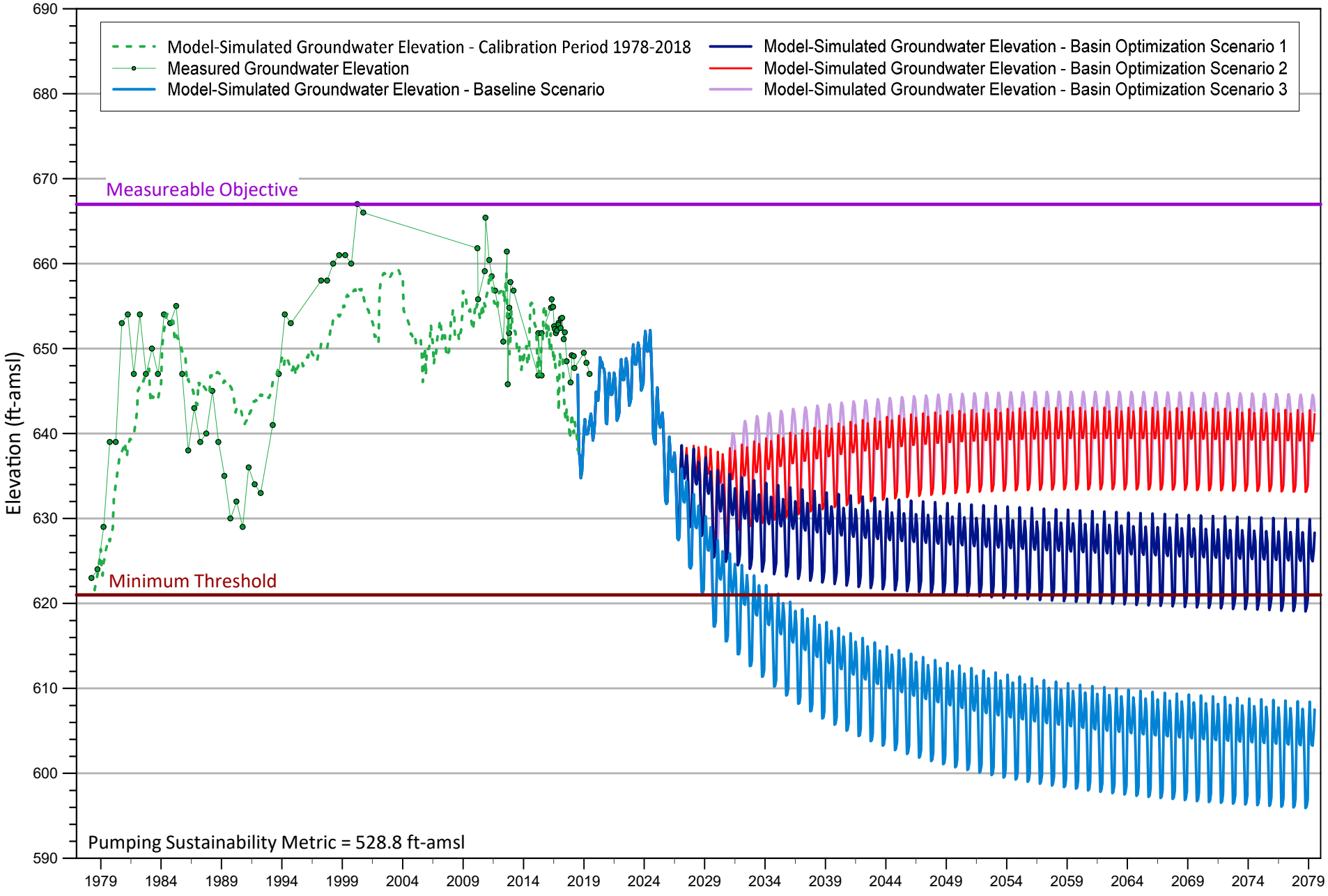


Figure 3-6g. Historical and Projected Groundwater Elevations for Baseline and Basin Optimization Scenarios at P-19

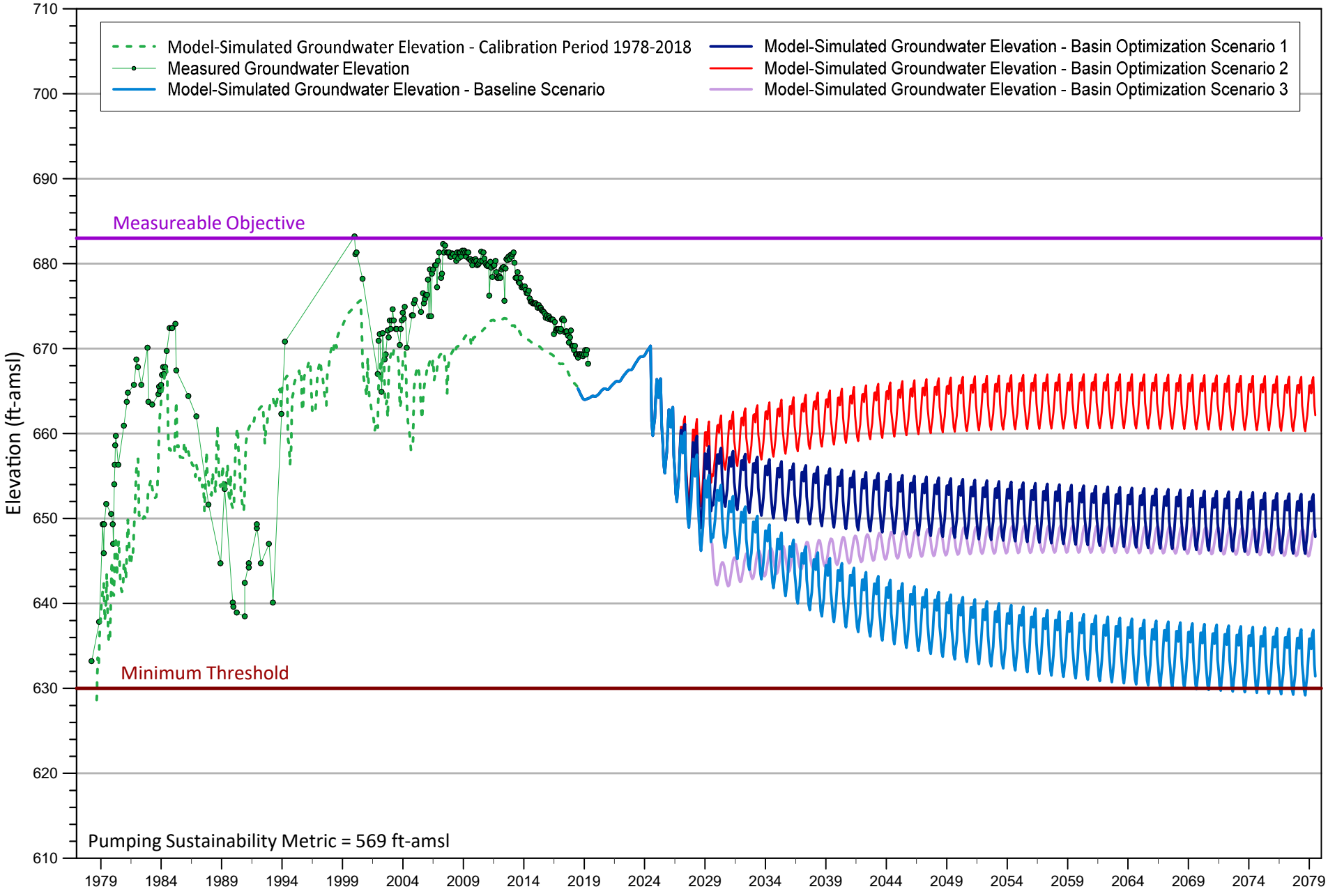


Figure 3-6h. Historical and Projected Groundwater Elevations for Baseline and Basin Optimization Scenarios at OMW-3

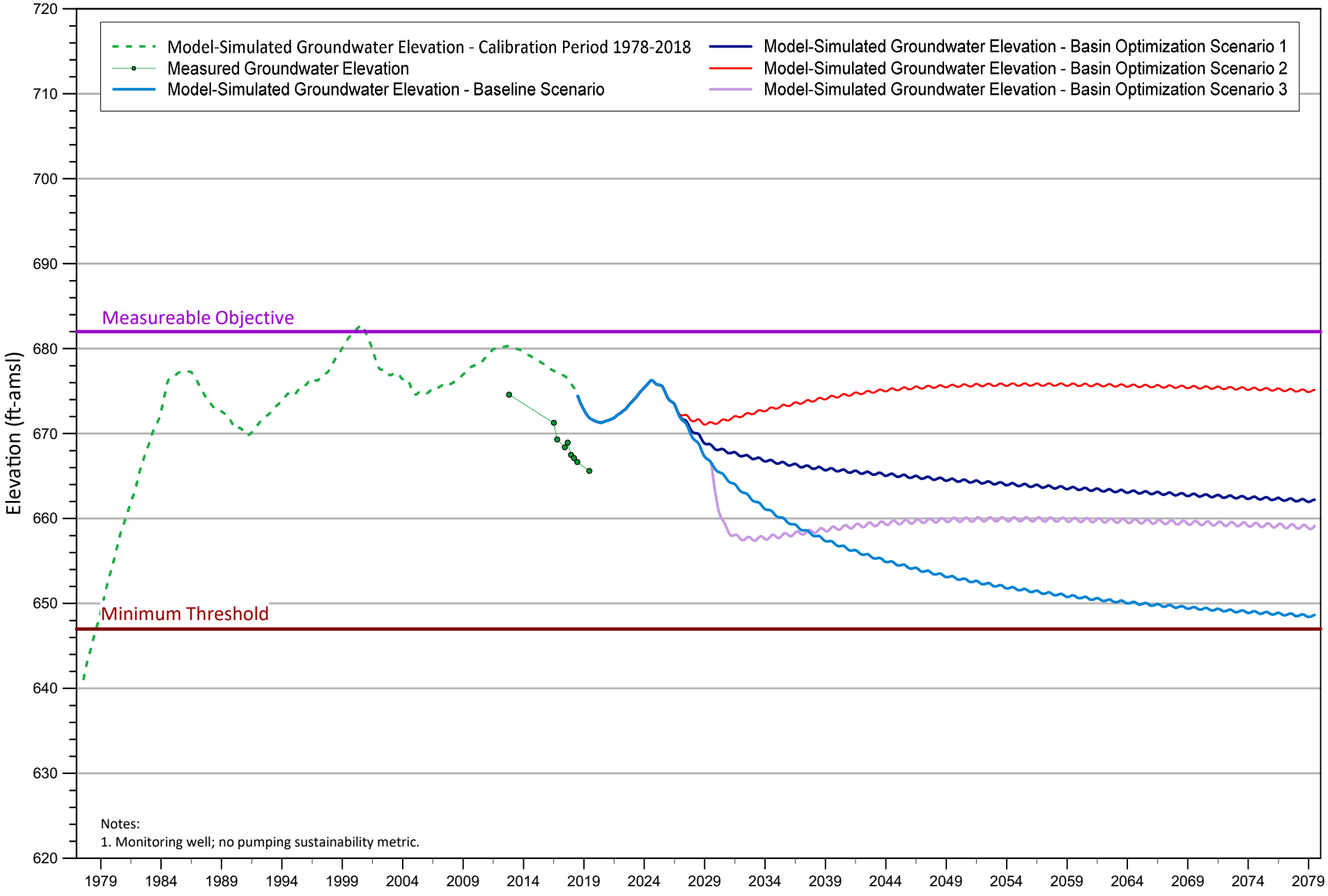


Figure 3-6i. Historical and Projected Groundwater Elevations for Baseline and Basin Optimization Scenarios at New Production Well 4

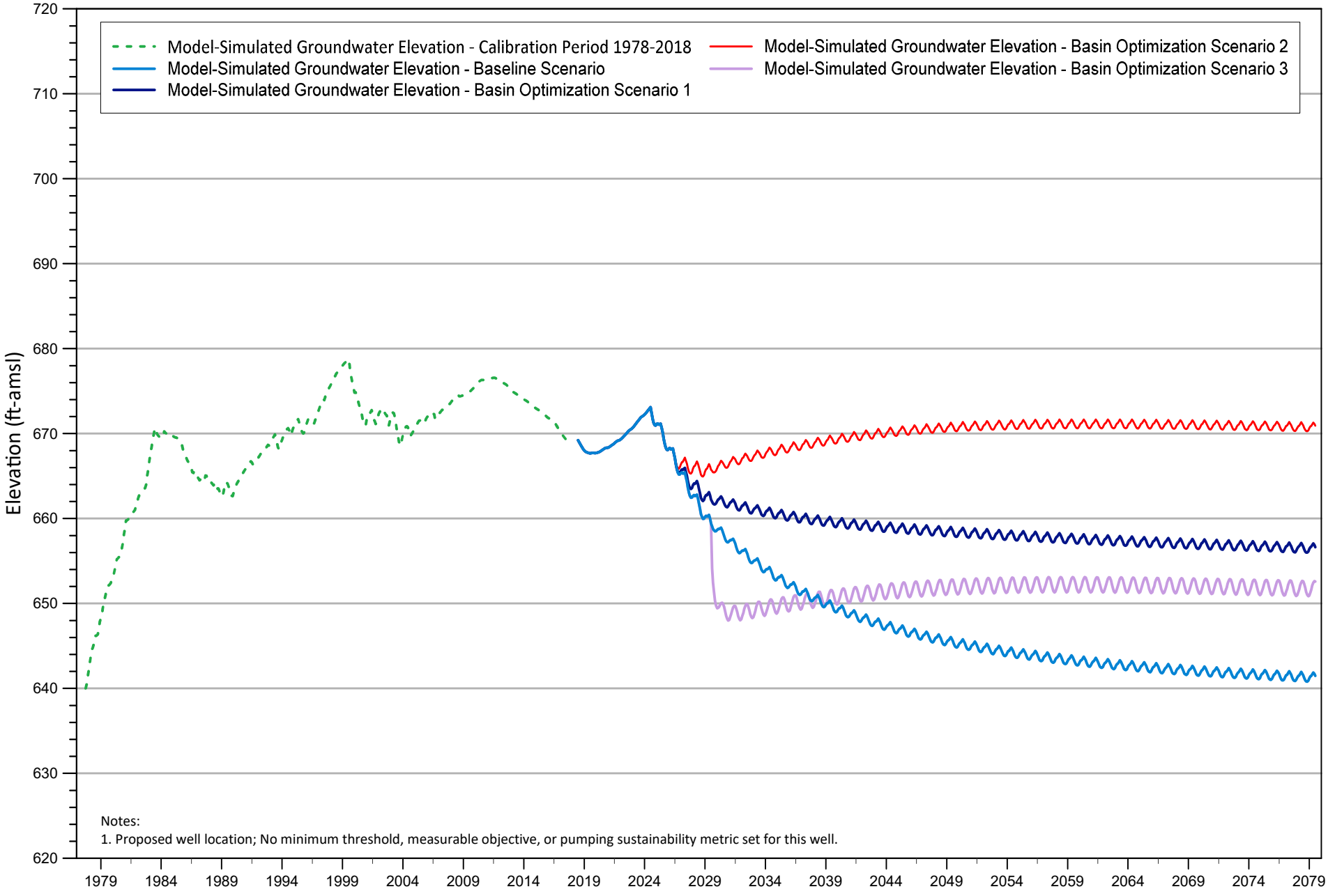


Figure 3-6j. Historical and Projected Groundwater Elevations for Baseline and Basin Optimization Scenarios at New Production Well 5

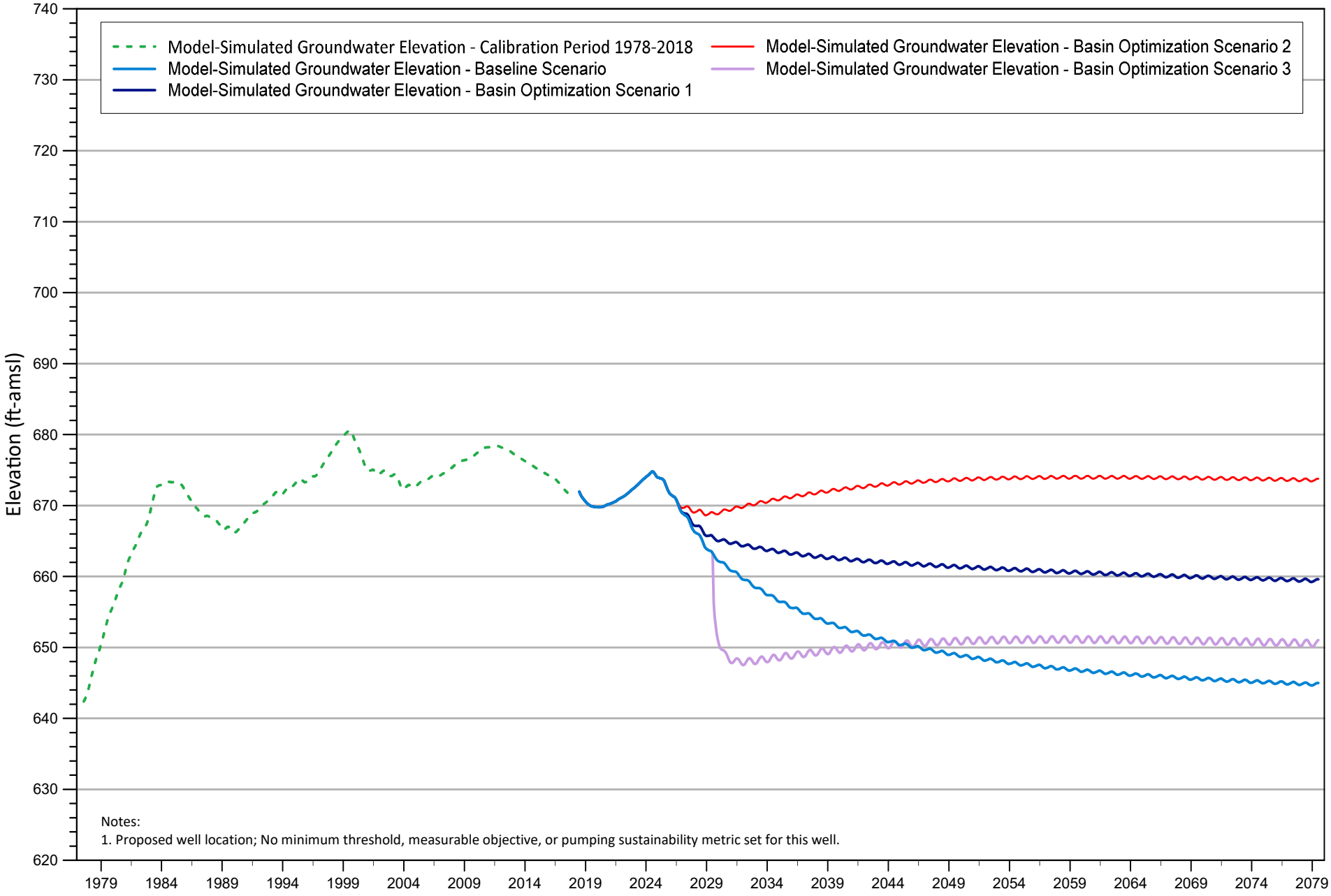
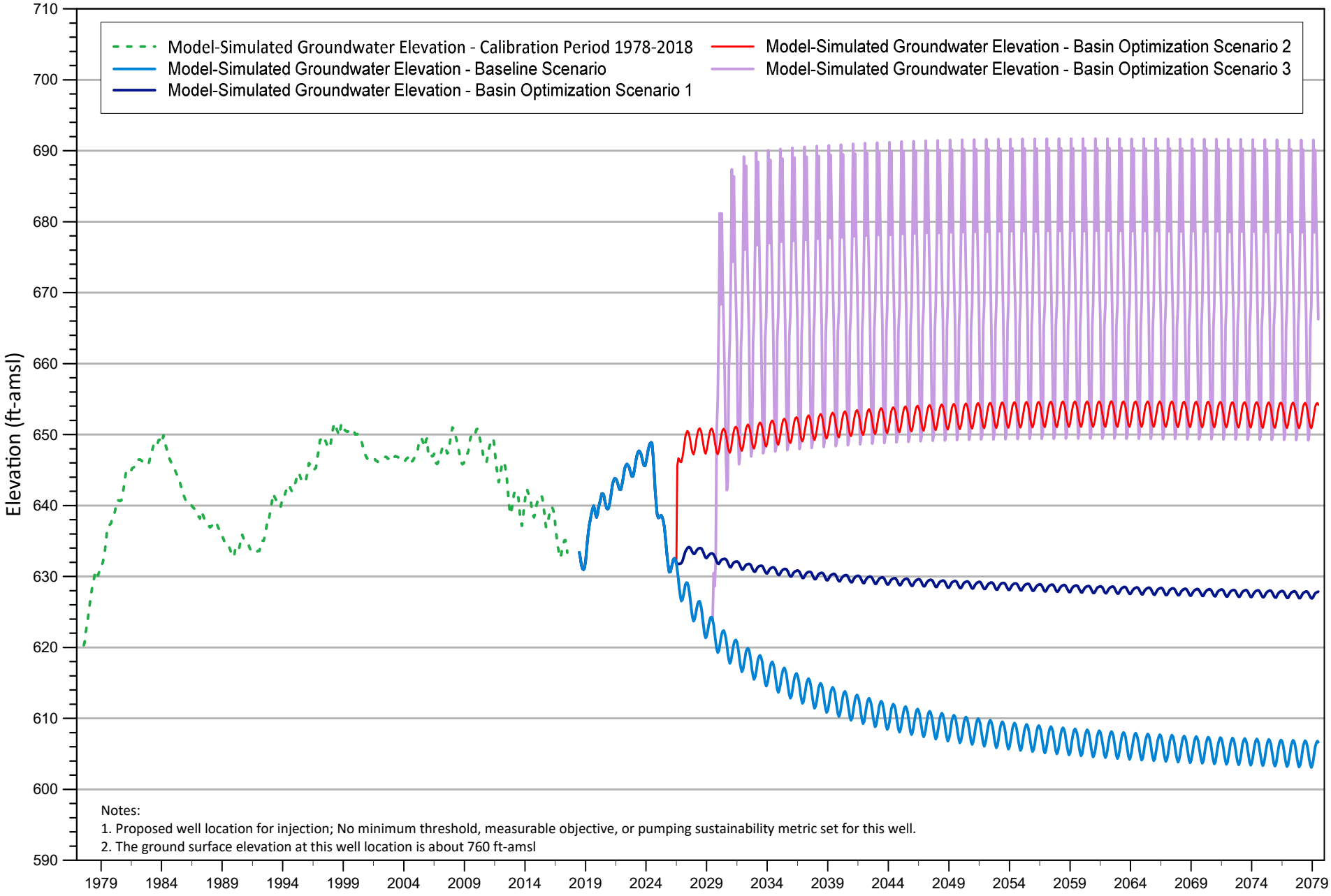


Figure 3-6k. Historical and Projected Groundwater Elevations for Baseline and Basin Optimization Scenarios at New Injection Well 3



Figures 3-6a through 3-6k show that over the planning period, groundwater levels at all eleven wells are predicted to be higher for the three Basin Optimization Scenarios compared to the Baseline Scenario. The seasonal fluctuations of the predicted groundwater elevations are due to the seasonal availability of the recycled water for recharge—more is available for recharge during winter and spring months when recycled water demands are low compared to the summer and fall. The seasonal fluctuations of the predicted groundwater elevations are also due to seasonal pumping schedules for the wells in the basin. The range in the season fluctuations of groundwater elevations is greatest in the western portion of the Basin where most of the pumping occurs and is downgradient of the assumed artificial recharge facilities.

For the wells in the western portion of the Basin (CPP-1, P-28, CPP-2, CPP-3, CPP-4, Industry, Injection Well 3) the highest projected groundwater levels are for Basin Optimization Scenario 3 where artificial recharge is 3,500 afy. For the wells in the eastern portion of the Basin (P-19, New Production Well 4, New Production Well 5, and OMW-3) the highest projected groundwater levels are in Basin Optimization Scenario 2 where artificial recharge in the basin is 500 afy with no increase in the groundwater pumping in the central portion of the Basin. The lowest projected groundwater levels occur in the eastern portion of the basin in Basin Optimization Scenario 3 because pumping increases by 3,000 afy and this area is distant from the areas of artificial recharge.

Figure 3-6k shows the historical and projected groundwater elevations for one assumed injection well in Basin Optimization Scenarios 2 & 3. At this injection well, groundwater elevations are projected to be higher than the Baseline Scenario by about 50 feet for Scenario 2 and by about 85 feet for Scenario 3 by the end of the planning period. The ground-surface elevation at this assumed injection well is about 760 ft-amsl. The highest projected groundwater elevation at this well occurs in Scenario 3 at about 690 ft-amsl, which equates to a minimum depth-to-groundwater of about 70 feet-below ground surface (ft-bgs) during the peak periods of injection. Therefore, there is no projected threat of liquefaction hazards due to high groundwater, which would occur at depths to groundwater less than about 40 ft-bgs.

Sustainable Management Criteria

Figures 3-6a through 3-6k include the Minimum Thresholds and Measurable Objectives established as Sustainable Management Criteria for groundwater levels at representative monitoring wells throughout the Spada Basin when applicable. The Minimum Thresholds represent the groundwater level at a representative monitoring well that, when exceeded individually or in combination with Minimum Thresholds at other monitoring wells, may cause Undesirable Results in the basin. The avoidance of Undesirable Results is key to the success of a GSP and an indication of basin sustainability. The Measurable Objectives are quantitative goals for the maintenance or improvement of groundwater conditions to achieve or maintain sustainability in the basin. Maintaining groundwater levels within the operating band between the Measurable Objectives and Minimum Thresholds will avoid Undesirable Results and achieve and maintain basin sustainability. These Minimum Thresholds and Measurable Objectives are also used as a proxy to assess the Sustainability Indicators of groundwater storage and land subsidence.

The wells in Figure 3-6a through 3-6k where the Minimum Thresholds and Measurable Objectives have been established are: Industry, CPP-4, P-28, CPP-1, P-19, and OMW-3.[2] The wells in Figures 3-6a through 3-6k that do not have Minimum Thresholds and Measurable Objectives established are wells that are close to wells that have Sustainable Management Criteria established and it is not needed as a representative monitoring site, or they are theoretical well locations proposed for Basin Optimization Scenario 3.

Figures 3-6a through 3-6k show that groundwater elevations for all three Basin Optimization Scenarios remain above the Minimum Thresholds throughout the planning period after projects are implemented. This indicates that all three Basin Optimization Scenarios are sustainable relative to these Minimum Thresholds and will not cause an Undesirable Results for groundwater levels, and by proxy groundwater storage and land subsidence. In comparison, the Baseline Scenario is not a sustainable option because groundwater elevations are predicted to decline to levels below the Minimum Thresholds at some of the wells.

At well CPP-4 the seasonal low groundwater elevation is slightly below the Minimum Threshold; this is not considered to be an exceedance of the Minimum Threshold and an Undesirable Result because the evaluation criteria established in TM 3 is that static groundwater elevations must remain below a Minimum Threshold for an entire year to constitute an Undesirable Result. If a Minimum Threshold for the theoretical well locations for the New Pumping Wells 4 and 5 were set based on the lowest historical groundwater elevation at these locations, the groundwater elevations projected for all three Basin Optimization Scenarios remain above these elevations.

At wells Industry, CPP-4, and P-28, the predicted groundwater elevations for Basin Optimization Scenario 3 temporarily decline below the Minimum Thresholds between 2028 and 2031. This is because the artificial recharge projects to support groundwater levels in Scenario 3 are not implemented until 2030, and increased pumping is assumed to start in 2030 simultaneously with the artificial recharge. If Basin Optimization Scenario 3 is implemented, the startup timing of artificial recharge and new pumping may need to be adjusted to avoid these projected declines of groundwater levels below the Minimum Thresholds.

Pumping Sustainability

The time-series charts in Figures 3-6a through 3-6k include a pumping sustainability metric for the active pumping wells. The pumping sustainability metric is the lowest water-level elevation that enables the well owner to pump groundwater at a desired pumping rate, given the well construction and pumping equipment. Groundwater pumping at a well is presumed to be sustainable if the water level at that well remains above the pumping sustainability metric. Information on the pumping sustainability metric was provided by the well owners for each well. The active pumping wells where these pumping sustainability metrics have been established include: Industry, CPP-4, CPP-2, P-28, CPP-1, and P-19. The pumping sustainability metric for one active well (CPP-3) is undetermined at this time.

[2] Well MW-5 has Minimum Thresholds and Measurable Objectives but was excluded from this analysis because the model-predicted groundwater elevations cannot be used as this is an area of uncertainty identified during calibration of the Spadra Basin Groundwater Model.

Figures 3-6a through 3-6k show that groundwater levels in all three Basin Optimization Scenarios remain above the pumping sustainability metric throughout the planning period after the projects are implemented. This indicates that all three Basin Optimization Scenarios are sustainable relative to the pumping sustainability metrics and improve upon the Baseline Scenario where groundwater levels decline below the pumping sustainability metrics at some wells.

Well CPP-4 (Figure 3-6b) in Scenario 3 is an exception where the seasonal low groundwater level declines below the pumping sustainability metric between 2028 and 2031. This is because the artificial recharge projects to support groundwater levels in Scenario 3 are not implemented until 2030, and increased pumping is assumed to start in 2030 simultaneously with the artificial recharge. If Basin Optimization Scenario 3 is implemented, the startup timing of artificial recharge and new pumping may need to be adjusted to avoid these projected declines of groundwater levels below the pumping sustainability metric.

Change in Storage

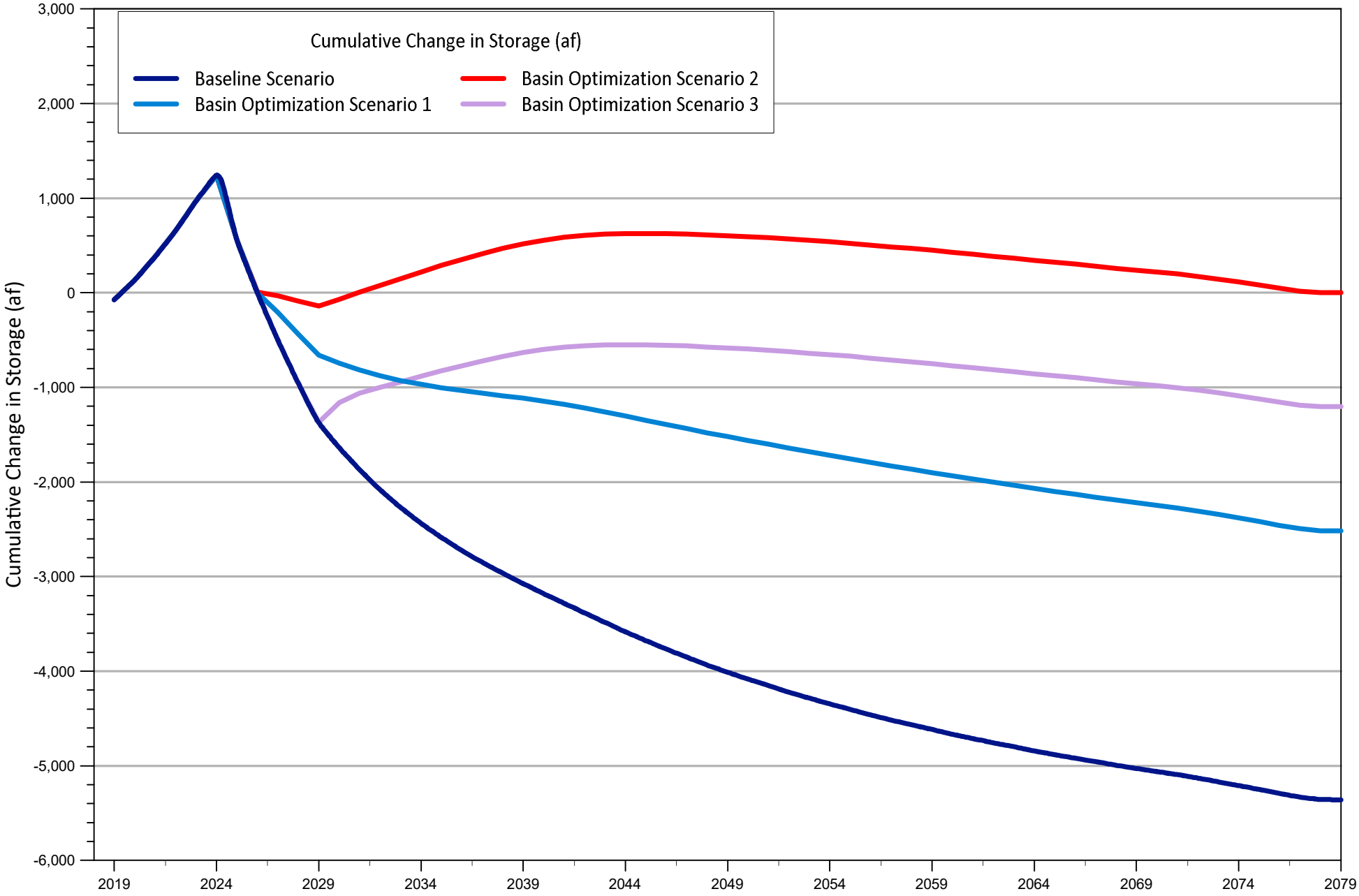
Tables 3-2a, 3-2b, 3-2c are water-budget tables for the Spadra Basin that show the model-estimated storage changes that are expected to occur under the three Basin Optimization Scenarios. Figure 3-7 is a time-series chart that shows the cumulative storage change for the three Basin Optimization Scenarios compared against the Baseline Scenario. This chart shows that the storage changes in all three Basin Optimization Scenarios over the planning period are less than in the Baseline Scenario. The increases in storage in Basin Optimization Scenarios 1, 2, and 3 coincide with the implementation of the proposed projects in each scenario in 2027, 2027, and 2030, respectively. Storage is the greatest in Basin Optimization Scenario 2 where storage remains relatively stable over the planning period. At the end of the planning period, the net storage change for Basin Optimization Scenario 1, 2, and 3 is -2,516 af, +3 af, and -1,201 af, respectively.

The Minimum Thresholds for groundwater levels are used as a proxy for groundwater storage. Groundwater levels for the three Basin Optimization Scenarios are predicted to remain above the Minimum Thresholds at the representative monitoring wells over the planning period (Section 3.2), and hence, this indicates that all three Basin Optimization Scenarios are sustainable for groundwater storage. In comparison, the Baseline Scenario is not a sustainable option because the groundwater elevations are predicted to decline below the Minimum Thresholds at some of the wells.

Subsurface Outflow to the Chino Basin

Tables 3-2a, 3-2b, 3-2c show the model-estimated annual subsurface outflow to the Chino Basin as a discharge component in the water budget for the three Basin Optimization Scenarios. Figure 3-8 is a time-series chart that compares the subsurface outflow to the Chino Basin for the three Basin Optimization Scenarios to the Baseline Scenario. Subsurface outflow to Chino Basin for all three Basin Optimization Scenarios is greater than in the Baseline Scenario, with Scenario 2 resulting in the greatest outflow. In all scenarios, the outflow to Chino Basin is relatively stable over the planning period and the differences between the scenarios is relatively small (typically, less than 60 afy). As described in TM 2, the groundwater model simulates this boundary area with Chino Basin as having very low hydraulic conductivity with highest model uncertainty. The low hydraulic conductivity in this area of the model domain appears to govern the subsurface outflow to Chino Basin, keeping it relatively constant even as storage changes occur within the Spadra Basin.

Figure 3-7. Cumulative Change in Storage for the Baseline and Basin Optimization Scenarios



Subsurface Outflow to the Puente Basin

Tables 3-2a, 3-2b, 3-2c show the model-estimated annual subsurface outflow to the Puente Basin as a discharge component in the water budget for the three Basin Optimization Scenarios. Figure 3-9 is a time-series chart that compares the subsurface outflow to the Puente Basin for the three Basin Optimization Scenarios to the Baseline Scenario. Subsurface outflow to the Puente Basin for all three Basin Optimization Scenarios is greater than in the Baseline Scenario, with Scenario 3 resulting in the greatest outflow. The increase in the subsurface outflow to Puente Basin for Basin Optimization Scenarios 1, 2, and 3 occurs after implementation of the proposed projects that support groundwater levels. In all scenarios, the outflow to Puente Basin is relatively stable over the planning period after about 2035 and the differences between the scenarios is relatively small (typically, less than 70 afy). By the end of the planning period, subsurface outflow to the Puente Basin in the three Basin Optimization Scenarios is about 400 to 500 afy greater than in the Baseline Scenario.

Figure 3-8. Subsurface Outflow to Chino Basin for the Baseline and Basin Optimization Scenarios

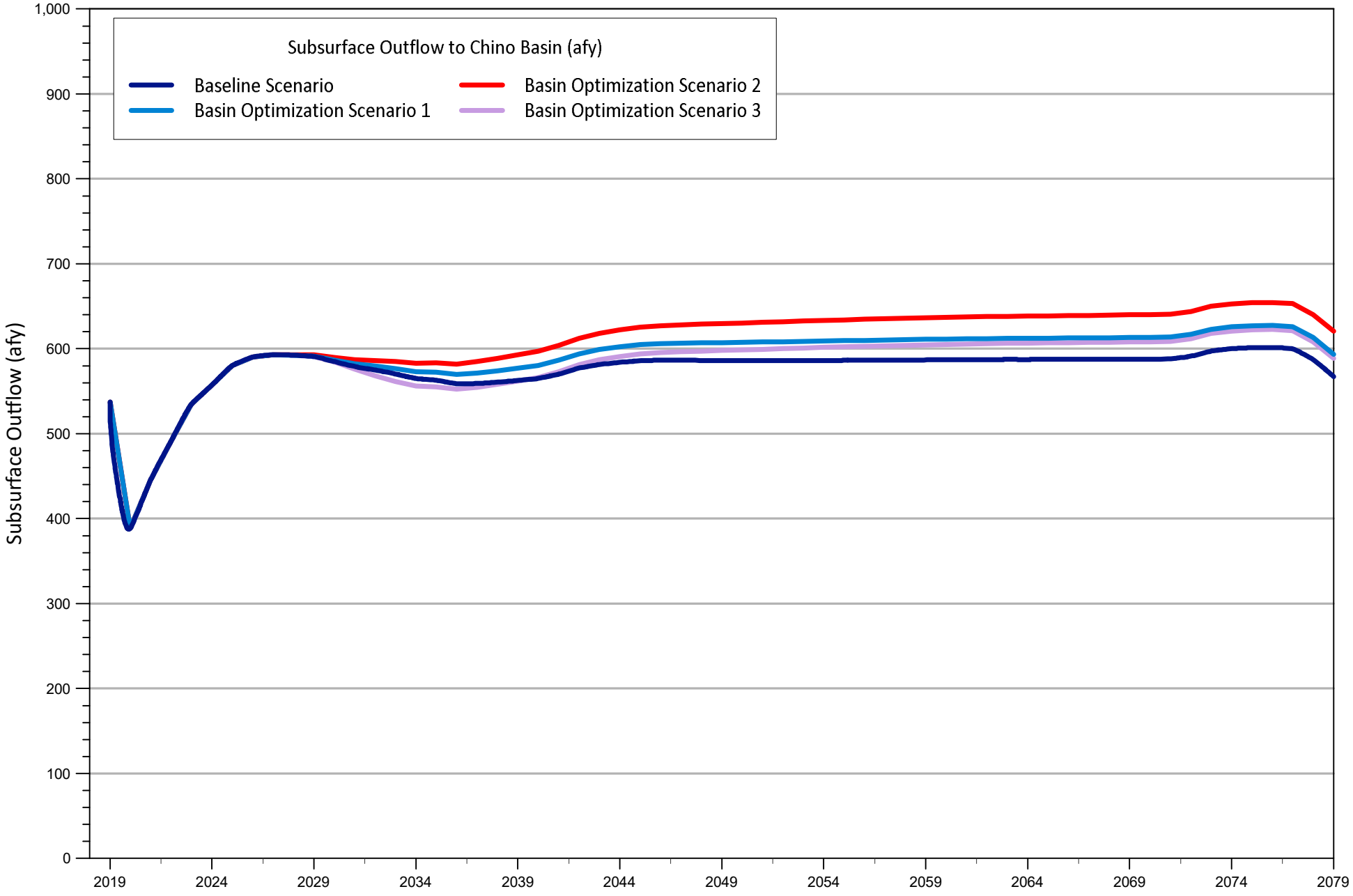


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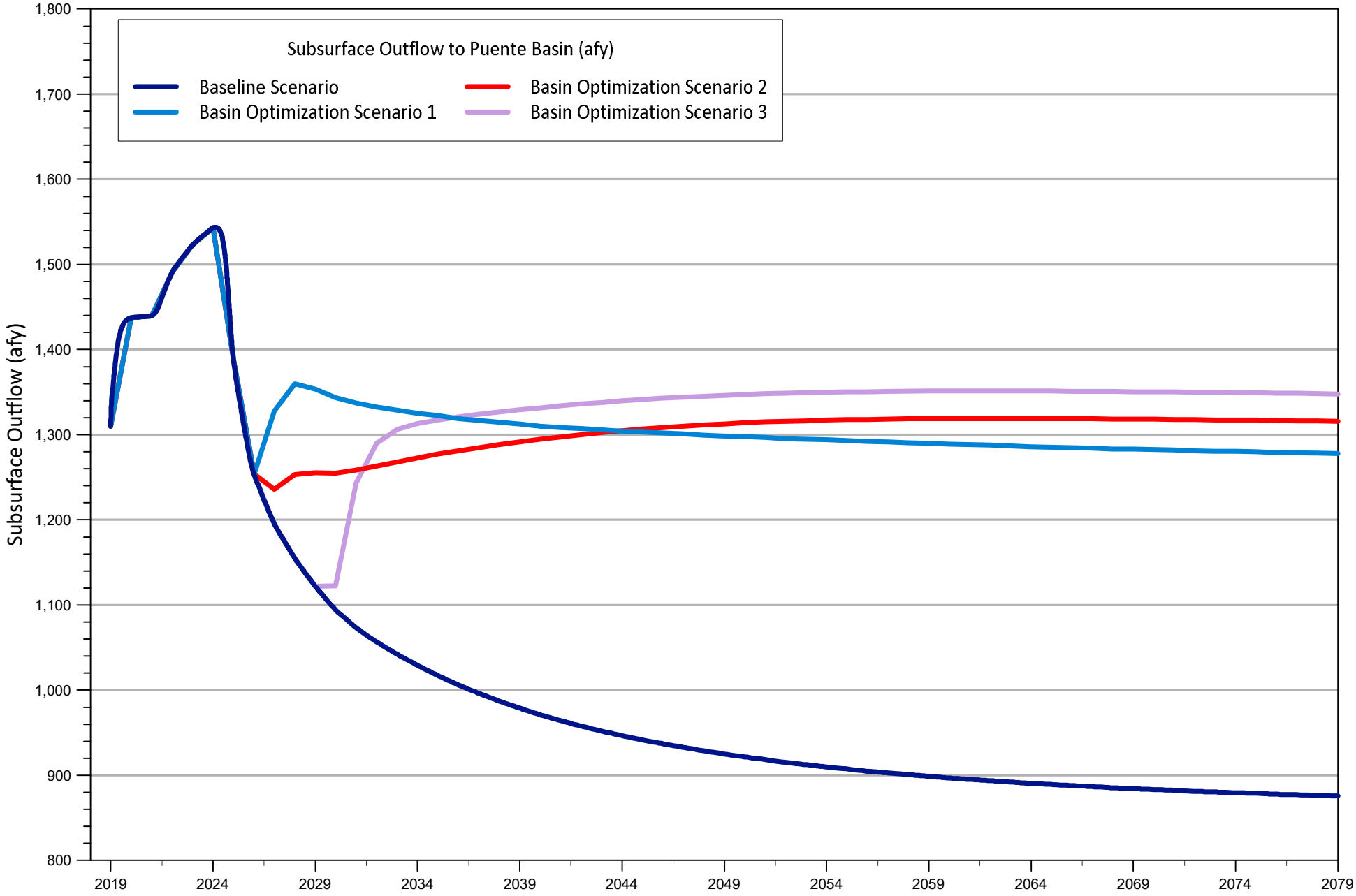
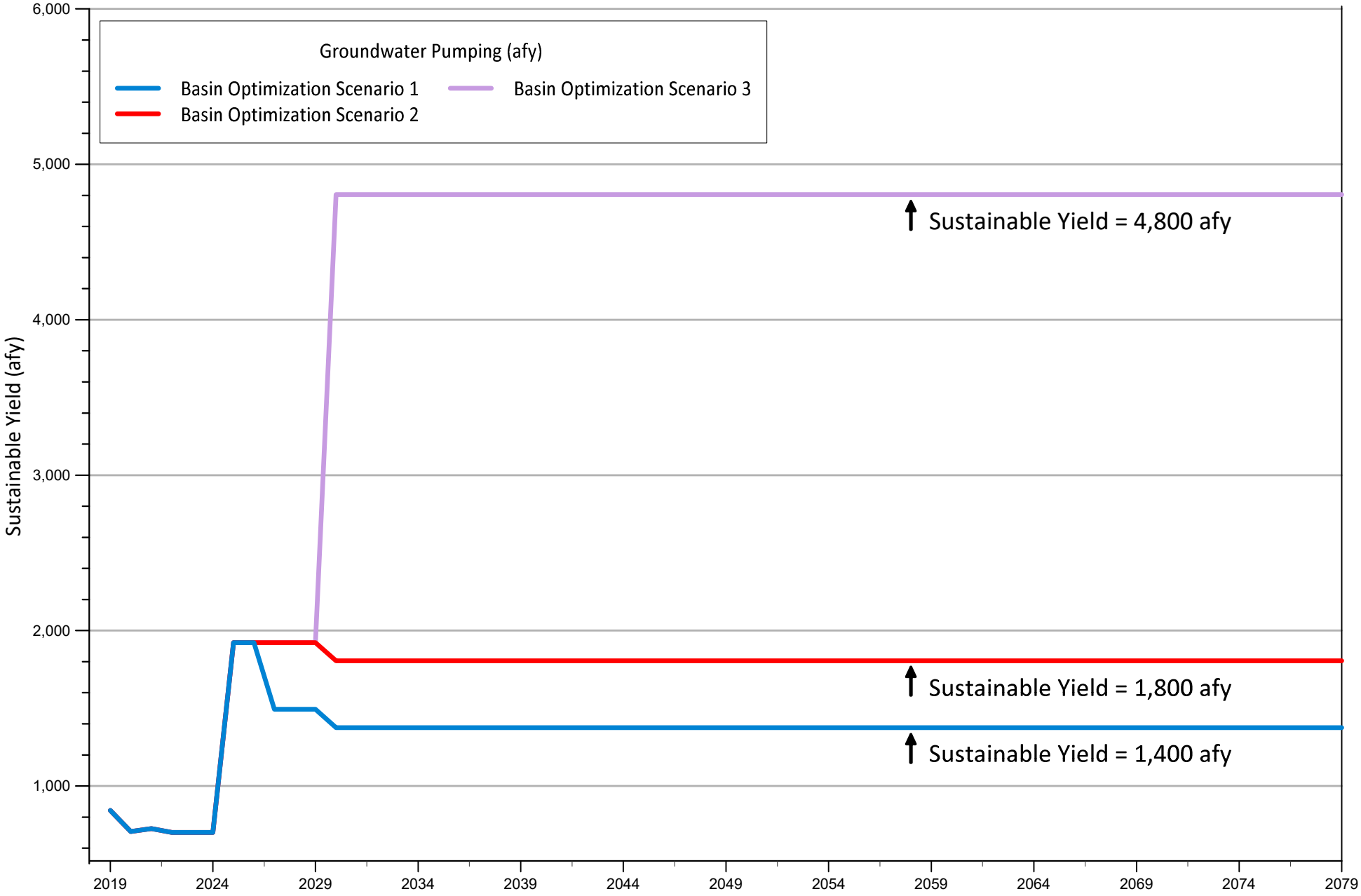
Figure 3-9. Subsurface Outflow to Puente Basin for the Baseline and Basin Optimization Scenarios



Sustainable Yield

The term Sustainable Yield is central to SGMA and is defined as the maximum quantity of water that can be withdrawn annually from a groundwater supply without causing Undesirable Results. The model-simulated groundwater elevations at the individual wells analyzed in Section 3.2 indicate that for all three Basin Optimization Scenarios groundwater elevations remaining above the Minimum Thresholds over the planning period. Thus, there are no Undesirable Results anticipated for Basin Optimization Scenarios 1, 2, and 3, and the long-term pumping volume associated with each Basin Optimization Scenario (after project startup) is the Sustainable Yield for that scenario. Figure 3-10 is a chart that shows the annual pumping for the three Basin Optimization Scenarios. The chart shows that the Sustainable Yields for Basin Optimization Scenario 1, 2, and 3 are: 1,376 afy, 1,806 afy, and 4,806 afy, respectively.

Figure 3-10. Sustainable Yield for the Basin Optimization Scenarios



COST ANALYSES OF THE BASELINE AND BASIN OPTIMIZATION SCENARIOS

Cost models were developed of the water supply for the Baseline Scenario and the three Basin Optimization Scenarios. The cost model of the Baseline Scenario is used for comparison to the cost models of the three Basin Optimization Scenarios to assist the GSA with selecting projects or a Basin Optimization Scenario for implementation in the GSP implementation plan. However, the Baseline Scenario cannot be directly compared to the Basin Optimization Scenarios because the Baseline Scenario does not have the benefits of basin sustainability like all three Basin Optimization Scenarios.

Water Supply Cost for Baseline Scenario

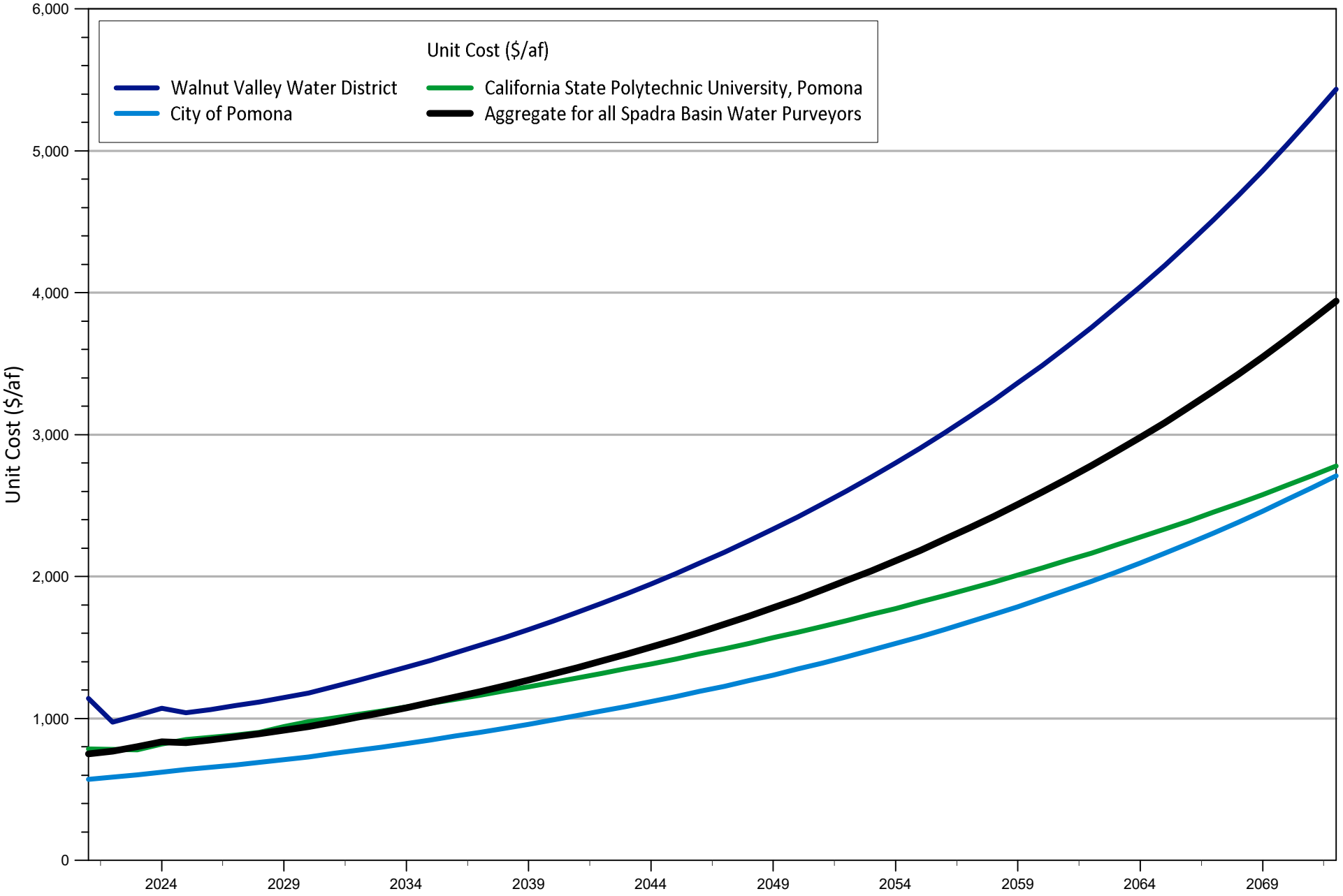
A cost model for the Baseline Scenario was developed for the water-supply plans of the individual water purveyors in the Spadra Basin and in aggregate. The cost model for the Baseline Scenario is shown in multiple steps and tables in Appendix B:

- Tables B-1a, B-1b, and B-1c include a breakdown of water-supply plan for the Baseline Scenario into annual estimates for the period 2021-2072 for each water purveyor and total aggregate of all water purveyors.
- Tables B-2a, B-2b, and B-2c include a breakdown of the annual unit costs for each of the water purveyors' water supplies for the period of 2021-2072, and the melded cost for all water supplies for each water purveyor. We worked with each water purveyor to generate the unit costs for 2021. Each water purveyor provided data and information in different formats and level of detail. The unit costs were grouped into the following categories:
    i. *Commodity costs* are the cost of acquiring the water supply. For example, the commodity costs for Six Basins and Chino Basin groundwater are the Watermaster assessments.
    ii. *Production costs* are the energy costs associated with producing the water supply.
    iii. *Operations and Maintenance (O&M) costs* are the variable costs for field staff, contract services, tools and equipment, training and supplies, repairs and general maintenance, and the regulatory compliance associated with producing the water supply. This excludes maintenance on reservoirs or pipelines and the variable O&M costs associated with treatment.
    iv. *Treatment costs* include the costs for chemicals and other variable O&M associated with the treatment necessary to produce potable water.
- Table B-3 includes a breakdown of annual water-supply plan as a total aggregate of all water purveyors in the Spadra Basin for the Baseline Scenario.
- Table B-4 includes a breakdown of the melded unit cost for all water supplies as a total aggregate for all water purveyors in the Spadra Basin for the Baseline Scenario.

All unit cost, except for the imported water, were assumed to increase by 2.5 percent per year. The unit cost of Tier 1 treated imported water from the Three Valleys Municipal Water District (TVMWD) was obtained from the TVMWD for the cost through 2030, then assumed to increase 4.0 percent annually thereafter based on average rate of inflation from 2003 to 2021 of Tier 1 water.

Figure 4-1 displays the melded unit cost of each water purveyors' water-supply plan for the Baseline Scenario (breakdown shown in Tables B-2a, B-2b, and B-2c) along with the melded unit cost for the water purveyors in aggregate (breakdown shown in Table B-3b). The melded unit cost of the water purveyors' water-supply plans increases over time, and the rate of increase for each water purveyor is dependent on its mix of water sources. The aggregate melded unit cost of water for the Spadra Basin water purveyors for the Baseline Scenario increases from $751 af in 2021 to $3,941 in 2072.

Figure 4-1. Melded Unit Cost of Water Supply for the Spadra Basin Water Purveyors for the Baseline Scenario



Water Supply Cost for Basin Optimization Scenarios

Cost models for the three Basin Optimization Scenarios were developed for the water-supply of the water purveyors in the Spadra Basin in aggregate. The cost model for the Basin Optimization Scenarios includes the conceptual engineering cost estimates for the implementation of the projects in the Basin Optimization Scenarios, and water supply plans and unit costs for water for the Spadra Basin water purveyors in aggregate. The cost model for the Basin Optimization Scenarios 1, 2, and 3 is shown in multiple steps and tables in Appendix C:

Table C-1 lists planning criteria for the unit cost of equipment and materials and other assumptions that were used to estimate the cost for implementing the projects for the three Basin Optimization Scenarios.

- Tables C-2a, C-2b, and C-2c include high-level conceptual engineering cost estimates for the projects envisioned for Basin Optimization Scenarios 1, 2, and 3. Feasibility-level design and operating schemes for each new project were cost estimated based on the unit cost and assumptions in Table C-1. The estimates include costs for construction (including engineering, management, and administrative), operations and maintenance, and loans to pay for these capital improvements (assumed 30 years).
- Tables C-3a, C-3b, and C-3c include a breakdown of annual water-supply plan as a total aggregate of all water purveyors in the Spadra Basin for the Basin Optimization Scenarios 1, 2, and 3.
- Tables C-4a, C-4b, and C-4c include a breakdown of the annual melded unit cost for all water supplies as a total aggregate of all water purveyors in the Spadra Basin for the Basin Optimization Scenarios 1, 2, and 3.

Like the Baseline Scenario, all unit cost, except for the imported water, were assumed to increase by 2.5 percent per year. The unit cost of Tier 1 treated imported water from the TVMWD was obtained from the TVMWD for the cost through 2030, then assumed to increase 4.0 percent annually thereafter based on average rate of inflation from 2003 to 2021 of Tier 1 water.

Figure 4-2 is a time-series chart that displays the annual melded unit cost of water for all Spadra Basin water purveyors in aggregate for the Basin Optimization Scenarios 1, 2, and 3 (breakdown shown in Table C-4a, C-4b, and C-4c) plotted with the annual melded unit cost of water for all Spadra Basin water purveyors in aggregate for the Baseline Scenario (breakdown shown in Table B-3b). Table 4-1 summarizes these annual aggregate melded unit costs of water for the Baseline Scenario and Basin Optimization Scenarios 1, 2, and 3.

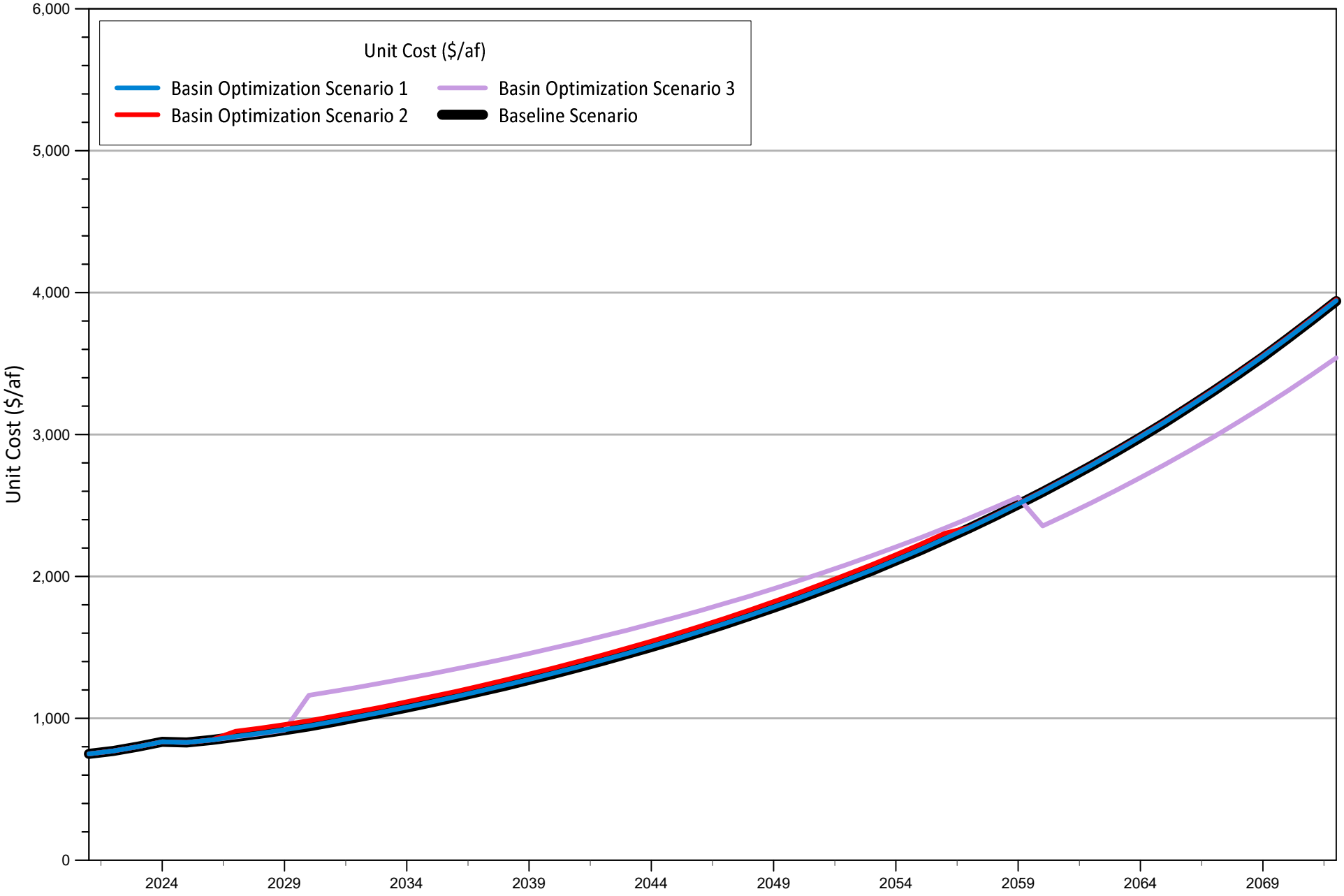
Table 4-1. Aggregate Melded Unit Costs of Water Supply for the Baseline and Basin Optimization Scenarios

Year	Total Annual Cost, $				
	Baseline	Scenario 1	Scenario 2	Scenario 3	Scenario 3b
2021	751	751	751	751	751
2022	771	771	771	771	771
2023	801	801	801	801	$801
2024	835	835	835	835	835
2025	830	830	830	830	830
2026	848	848	848	848	848
2027	870	873	909	870	870
2028	892	895	931	892	892
2029	917	920	956	917	917
2030	944	947	983	1,163	1,160
2031	975	979	1,015	1,191	1,188
2032	1,008	1,011	1,048	1,220	1,217
2033	1,042	1,045	1,082	1,251	1,248
2034	1,077	1,080	1,117	1,282	1,279
2035	1,113	1,116	1,153	1,315	1,312
2036	1,150	1,154	1,190	1,349	1,346
2037	1,189	1,193	1,230	1,384	1,381
2038	1,230	1,233	1,270	1,420	1,417
2039	1,271	1,275	1,312	1,458	1,455
2040	1,315	1,318	1,355	1,497	1,494
2041	1,359	1,363	1,400	1,537	1,534
2042	1,406	1,410	1,447	1,578	1,575
2043	1,454	1,458	1,495	1,622	1,619
2044	1,504	1,507	1,545	1,666	1,663
2045	1,555	1,559	1,596	1,712	1,709
2046	1,609	1,613	1,650	1,760	1,757
2047	1,664	1,668	1,705	1,810	1,807
2048	1,721	1,725	1,763	1,861	1,858
2049	1,781	1,785	1,822	1,914	1,911
2050	1,842	1,847	1,884	1,969	1,966
2051	1,906	1,910	1,948	2,025	2,022
2052	1,972	1,977	2,014	2,084	2,081
2053	2,041	2,045	2,083	2,145	2,142
2054	2,112	2,116	2,154	2,208	2,205
2055	2,185	2,190	2,228	2,274	2,270
2056	2,262	2,266	2,304	2,341	2,338

Table 4-1. Aggregate Melded Unit Costs of Water Supply for the Baseline and Basin Optimization Scenarios

Year	Total Annual Cost, $				
	Baseline	Scenario 1	Scenario 2	Scenario 3	Scenario 3b
2057	2,341	2,344	2,347	2,411	2,408
2058	2,423	2,425	2,429	2,484	2,481
2059	2,507	2,510	2,515	2,559	2,556
2060	2,595	2,599	2,603	2,357	2,357
2061	2,687	2,690	2,694	2,438	2,437
2062	2,781	2,784	2,789	2,521	2,521
2063	2,879	2,883	2,887	2,607	2,607
2064	2,981	2,984	2,989	2,697	2,697
2065	3,086	3,090	3,094	2,790	2,790
2066	3,195	3,199	3,204	2,886	2,886
2067	3,309	3,312	3,317	2,986	2,985
2068	3,426	3,430	3,435	3,089	3,088
2069	3,548	3,552	3,557	3,196	3,195
2070	3,674	3,678	3,683	3,307	3,306
2071	3,805	3,809	3,814	3,421	3,421
2072	3,941	3,945	3,950	3,540	3,540

Figure 4-2. Aggregate Melded Unit Cost of Water Supply for the Baseline and Basin Optimization Scenarios



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The aggregate melded unit cost of water for the Baseline Scenario is plotted and shown in Figure 4-2 and Table 4-1 with the aggregate melded unit cost of water for the three Basin Optimization Scenarios for comparison. However, as described above, the Baseline Scenario cannot be directly compared to the Basin Optimization Scenarios because the Baseline Scenario does not have the benefits of basin sustainability like all three Basin Optimization Scenarios.

The aggregate melded unit cost of water for Basin Optimization Scenarios 1 and 2 are slightly more expensive than the aggregate melded unit cost of water for the Baseline Scenario. This is because the Spadra Basin is a relatively small portion of the total water supply, and these scenarios include only a few capital projects.

The aggregate melded unit cost of water for Basin Optimization Scenario 3 averages about $150/af more than the aggregate melded unit cost of water for the Baseline Scenario and Basin Optimization Scenarios 1 and 2 from 2030-2059, and then declines to about $400/af less than these other scenarios after the loans for capital improvements are paid off. Basin Optimization Scenario 3 is less expensive in the long run because of the investment in facilities that produce a local, more reliable, and less expensive water supply as an alternative to the imported water.

CONCLUSIONS AND RECOMMENDATIONS

Table 5-1 summarizes the evaluation of the three Basin Optimization Scenarios compared to the Baseline Scenario.

The Baseline Scenario is not projected to be sustainable with respect to the Sustainable Management Criteria established in TM 3. The GSP implementation plan should include plans to implement projects and management actions to support groundwater levels, avoid Undesirable Results, and maintain the sustainability of the Spadra Basin.

The three Basin Optimization Scenarios described and evaluated herein are hydrologically feasible and sustainable based on the model-estimated response of the Spadra Basin. Compared to the Baseline Scenario, all three Basin Optimization Scenarios are expected to result in: (i) higher groundwater levels that do not decline below Minimum Thresholds or pumping sustainability metrics; (ii) no significant and unreasonable land subsidence or reductions of groundwater storage; (iii) higher Sustainable Yields; and (iv) no reductions in subsurface outflow to the neighboring groundwater basins. In other words, the Basin Optimization Scenarios are sustainable and will avoid the occurrence of Undesirable Results.

Basin Optimization Scenario 3 is the recommended scenario for GSP implementation. It produces the highest Sustainable Yield of the Spadra Basin by recharging surplus recycled water from the Pomona WRP and increasing groundwater production by similar volumes. Through groundwater treatment, it increases local, reliable, potable water supplies as an alternative to the use of less reliable imported waters (which are expected to experience higher inflation rates than the local water supplies).

Scenario 3 will require permitting from the LA Regional Board with oversight from the State Water Board, and potentially the development of a SNMP for the Spadra Basin or inclusion of the Spadra Basin in the San Gabriel Valley Basin SNMP (Stetson Engineers Inc., 2016). The permitting process and the development of an SNMP are both extensive efforts that will require multiple years to complete. These efforts will be completed during Phase 4 of the planning process necessary for the implementation of

these projects that is described in the GSP in Section 6 Implementation Plan. Additionally, the costs and schedule for permitting and development of an SNMP are considered in the cost and schedules presented in the GSP in Sections 6.2 and 6.1.

Basin Optimization Scenario 3 is the most expensive scenario through 2059 but is the least expensive scenario thereafter when the assumed loans to fund the capital improvements are paid off. The implementation plan in the final GSP should include plans to identify and apply for grant funding opportunities to reduce the cost of implementing Basin Optimization Scenario 3.

In Basin Optimization Scenario 3, groundwater levels are projected to decline in the eastern portion of the basin because of increased pumping. This is an area of highest uncertainty in the groundwater-flow model of the Spadra Basin (see TM 2), and hence, an area that should be monitored in the future for changes in groundwater levels and potential adverse impacts to the neighboring Chino Basin, such as reduced subsurface outflow. The Spadra Basin GSA is in the process of constructing a new monitoring well within the eastern portion of the basin near the Spadra/Chino Basin boundary. The data collected from the new monitoring well, and additional monitoring data collected in the eastern portion of the basin, will be used to detect potential adverse impacts and Undesirable Results, and also can be used to update and improve the groundwater model in the future.

Table 5-1. Summary of the Evaluation of Basin Optimization Scenarios Compared to the Baseline Scenario

		Baseline	Scenario 1	Scenario 2	Scenario 3
Project Description	Objective	n/a	Basin Sustainability	Basin Sustainability	Basin Sustainability and Maximum Beneficial Use
	Increase in Artificial Recharge from Baseline	n/a	0 afy	500 afy	3,500 afy
	Change in Pumping from Baseline	n/a	- 430 afy	0 afy	2,994 afy
	New Facilities	none	● Additional recycled water pipeline and connections	● Underground recharge gallery and pipeline ●Injection well and pipeline	● Underground recharge gallery and pipeline ● Seven injection wells and pipeline ● Five production wells and pipeline ● Expansion of CPP RO Plant and pipeline
Project Evaluation	Do groundwater levels decline below Minimum Thresholds?	Yes	No	No	No
	Do groundwater levels decline below pumping sustainability metrics?	Yes	No	No	No
	Subsurface Outflow to the Chino Basin	567 afy	593 afy	621 afy	589 afy
	Subsurface Outflow to the Puente Basin	876 afy	1,278 afy	1,316 afy	1,348 afy
	Sustainable Yield	n/a	1,376 afy	1,806 afy	4,806 afy
	Aggregate melded unit cost of water supply in 2072 ($/af)	$3,941	$3,945	$3,950	$3,540
	Benefits Other Than Sustainability	n/a	● Partial utilization of surplus recycled water	● Partial utilization of surplus recycled water	● Utilization of all surplus recycled water ● Increasing the reliability of potable water supplies

REFERENCES

California State Water Resources Control Board (State Water Board). 2019. Notice of Wastewater Change Petition WW0104. *County: Los Angeles. Streat System: San Jose Creek/San Gabriel River.* October 19, 2019.

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Environmental Science Associates (ESA), 2019. *Final San Gabriel River Watershed Project to Reduce River Discharge in Support of Increased Recycled Water Reuse. Final Environmental Impact Report State Clearinghouse No. 2018071021*. Prepared for Los Angeles County Sanitation Districts. October 2019.

Stetson Engineers Inc., 2016. *San Gabriel Valley Groundwater Basin Salt and Nutrient Management Plan. Main* San Gabriel Basin Watermaster. Final Draft Report May 2016.

Wood Environment & Infrastructure Solutions, Inc., 2019. *Draft Adaptive Management Plan for Los Angeles County Sanitation Districts San Gabriel River Watershed Project to Reduce River Discharge in Support of Increased Recycled Water Reuse.* Wood Project Number 1755500035. Prepared for Los Angeles County Sanitation Districts. October 2019.

Appendix A

Comments and Responses on Draft Technical Memorandum 5 – Part 1

Appendix A – Comments and Responses on the June 2021 Draft Technical Memorandum 5 (TM 5) Part 1: Sustainability of Basin Optimization Scenarios

Comments by Erinn Wilson-Olgin, Environmental Program Manager 1, California Department of Fish and Wildlife (CDFW)

The CDFW is writing to support ecosystem preservation in compliance with SGMA and its implementing regulations based on CDFW expertise and best available information and science.

In consideration of these SGMA regulations, the CDFW submits the following comments on the Spadra Basin TM5 for the GSP. The CDFW requests that the Spadra Basin Groundwater Sustainability Agency address these comments before submitting the GSP to the Department of Water Resources for evaluation and assessment**.**

Comment No. 1. Development of the Basin Optimization Scenarios, 2.2 Basin Optimization Scenarios (starting pp 4).

Issue: CDFW is concerned that a proposal to use surplus recycled water from the Pomona Wastewater Reclamation Plant (WRP) may be ineffective to meet the objectives of the Basin Optimization Scenario. These objectives include achieving long-term sustainability and maximizing its beneficial use. This is because recycled water may not be available for the GSA's use. Currently, surplus recycled water from the Pomona WRP is discharged to South San Jose Creek, where it flows downstream out of Spadra Basin and recharges "about 15 miles downstream, at the Montebello Forebay or is consumed by riparian vegetation at the Montebello Forebay." In October 2020, a wastewater change petition (WW0104) was approved to allow for surplus recycled water to be utilized instead of discharged to South San Jose Creek. As a condition of approval, the Los Angeles County Sanitation Districts (LACSD) must monitor, in perpetuity, the effects of reduced discharge on riparian vegetation supporting Least Bell's vireo (Vireo bellii pusillus), an endangered species under the California Endangered Species Act. If specific impact triggers are reached, remedial actions must be taken by LACSD, which will include resumed discharges of surplus recycled water into South San Jose Creek1. If LACSD resumes surplus recycled water discharge, this will remove some or all of the available surplus recycled water for use in the Spadra Basin. This, in turn, can undermine the Basin's ability to achieve sustainable goals if all the Basin Optimization Scenarios are dependent on the recycled water from Pomona WRP

Recommendation #1: LACSD may require some or all of the surplus recycled water to be discharged back to South San Jose Creek instead of allowing its use within Spadra Basin. Thus, the final GSP should determine if some or all of the surplus recycled water would be reclaimed for discharge back to South San Jose Creek.

Recommendation #2: The final GSP should develop specific triggers in the event LACSD/Pomona WRP no longer provides some or all of the surplus recycled water. Based on these specific triggers, management actions should be developed to account for a reduction in recycled water supply.

Response to Comment #1. We recognize that some or all the surplus recycled water from the Pomona WRP may not be available in the future. If a project selected and described in the Final GSP utilizes the surplus recycled water from the Pomona WRP, the GSP implementation plan will include a description of a contingency plan for the future uncertainty of the availability of the recycled water for recharge/reuse in the Spadra Basin. The contingency plan will include a description of the options for alternative water sources for recharge and projects and management strategies if the recycled water is no longer available.

As you described, the LACSD's Final Environmental Impact Report for the San Gabriel River Watershed Project to Reduce River Discharge in Support of Increased Recycled Water Reuse (FEIR) includes the implementation of an Adaptive Monitoring Plan (AMP) as a mitigation measure to ensure the quantity and quality of the riparian and wetland habitat downstream is maintained during reduced flow from multiple upstream treatment plants including the Pomona WRP. The AMP will be a component of implementing any project where there is increased use of the surplus recycled water for reuse/recharge and will be described in the Final GSP implementation plan.

The AMP will provide guidance on if there is an impact to the downstream habitat from reduced discharge from the Pomona WRP and the other LACSD treatment plants and will ultimately be used to determine if some or all of the surplus recycled water would be reclaimed for discharge back to the South San Jose Creek, and/or other mitigation measures.

Comment No. 2 Development of the Basin Optimization Scenarios, 2.2 Basin Optimization Scenarios, 2.2.2 Bain Optimization Scenario 2 – Sustainability through Recharge (starting pp 5) & 2.2.3 Basin Optimization Scenario 3 – Maximum Beneficial Use (starting pp 6).

Issue: According to TM 5, "Scenario 2 increases artificial recharge to the Spadra Basin from 0 afy [acre feet per year] to 500 afy via the construction of new recharge facilities for the recharge of recycled water from the Pomona WRP." In addition, TM 5 states, "Scenario 3 increases artificial recharge to the Spadra Basin from 0 afy to 3,500 afy via the construction of new recharge facilities for the recharge of recycled water from the Pomona WRP." Under these scenarios, it seems that surplus recycled water is the only means of artificial recharge. CDFW is concerned that this singular source of water may limit recharge efforts to what is only available via surplus water released from the Pomona WRP.

Recommendation: CDFW recommends the final GSP consider other methods of recharge in addition to artificial recharge with recycled water. These methods may include alternative ways to increase recharge, such as stormwater collection, urban runoff collection, drip irrigation systems, or groundwater treatment without the use of surplus recycled water from Pomona WRP. CDFW recommends the final GSP encourage projects and management actions needed to achieve basin sustainability to incorporate Low Impact Development (LID) design principles. These design principles should include those adopted by the City of Pomona (Ordinance 4185) to aid in sustainable stormwater management. Such LID designs that may increase stormwater use include on-site infiltration/biofiltration, bioretention and/or rainfall harvest and use. These types of designs may also decrease the need for groundwater pumping while also contributing to artificial recharge. As a note, CDFW will likely have a CEQA review and permitting nexus with groundwater projects such as those that capture stormwater (e.g., Lake and Streambed Alteration Agreements).

Response to Comment #2: The Basin Optimization Scenarios 2 & 3 assume artificial recharge projects ranging from 500 afy to 3,500 afy at potential locations that are conceptual at this time. The Basin Optimization Scenarios contemplate the use of recycled water for this artificial recharge, however, it is also possible that imported water, storm water, dry weather flow, or a combination of waters could be recharged at some of the potential locations. Recycled water is considered the primary source of recharge for the Basin Optimization Scenarios because of the stakeholder interest to utilize this local available source of water that is currently not being used in the Spadra Basin. Storm water recharge is not being considered at this time for the Basin Optimization Scenarios because of its infrequent availability, and it requires facilities with a larger storage capacity then those proposed and feasible in the Spadra Basin. If a project selected and described in the Final GSP utilizes the surplus recycled water from the Pomona WRP, the GSP implementation plan will include a description of a contingency plan that describes the potential utilization of source waters for recharge other than the recycled water.

The final GSP implementation plan will include an element to encourage the implementation of MS4 projects in the Spadra Basin that recharge storm-water runoff produced by land development, such as projects that incorporate the Low Impact Development (LID) design principles that the City of Pomona has adopted to comply with the Regional Board's MS4 permit (Ordinance 4185).

The following text was added in *Section 2.2 Basin Optimization Scenarios* of TM 5 part 1 (pages 4-5) to address Comments #1 and #2:

"The LA Sanitation Districts completed a final Environmental Impact Report (FEIR) for the reduced discharge to the San Gabriel River Watershed envisioned in the wastewater change petition for the Pomona WRP and three other treatment plants in the watershed (ESA, 2019). The FEIR includes a mitigation measure for the LA Sanitation Districts to implement an Adaptive Monitoring Plan (AMP) in coordination with the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Wildlife (CDFW) to ensure the quantity and quality of the riparian and wetland habitat downstream is maintained during reduced flow from the upstream

treatment plants. A draft AMP was developed and included as an attachment to the FEIR (Wood, 2019) and includes the monitoring of various vegetation parameters and trigger levels to implement responsive measures that could include resumed discharges to the river and tributary channels in sufficient volumes to support the habit sustained by historical discharges. If the final GSP includes the utilization of the surplus recycled water from the Pomona WRP, the GSP implementation plan will include a contingency plan to address the uncertainty of the future availability of all or part of the surplus recycled water. The contingency plan will include a description of the options for alternative water sources for recharge and projects and management strategies if the surplus recycled water is no longer available.

Recycled water is considered the primary source of recharge for the Basin Optimization Scenarios 2 & 3 because of the stakeholder interest to utilize this local available source of water that is currently not being used in the Spadra Basin. Basin Optimization Scenarios 2 & 3 contemplate the use of recycled water for artificial recharge ranging from 500 afy to 3,500 afy at locations that are conceptual at this time. However, it is also possible that imported water, storm water, dry weather flow, or a combination of waters could be recharged at some of the potential locations."

Comment No. 3 Figure 2-1 Location Map of Proposed New Projects for the Spadra Basin (pp 9) and Figure 2-2 Location Map of Wells and Facilities for Basin Optimization Scenarios (pp 11).

Issue: According to Figure 2-2, there are several potential locations sited for underground recharge galleries in the northern part of the basin. While these locations were identified because they are along and/or near the main Pomona WRP pipeline, CDFW is concerned about the construction activities associated with these new facilities and their impacts on wildlife. A search of the California Natural Diversity Database (CNDDB) indicates several occurrences of merlin (Falco columbarius) on site and within the vicinity of the western most recharge gallery. Raptors, such as merlins, are protected under Fish and Game Code section 3503.5. Construction activities may disturb the foraging habitat of over-wintering individuals in the area. According to Figure 2-1, the area sited for a recharge gallery is adjacent to or potentially overlapping agricultural land, which is the foraging area for merlins. In addition to merlins, a rare plant was recorded in the vicinity of the western gallery location. The San Bernardino aster (Symphyotrichum defoliatum) has a California Rare Plant Rank (CRPR) ranking of 1B.2. Plants with a CRPR of 1B.2 are rare, threatened, or endangered in California and elsewhere (CNPS 2020). CNDDB also indicated the occurrences of several other species near the eastern galleries. The species found in this area include, southern California legless lizard (Anniella stebbinsi), western yellow bat (Lasiuris xanthinus), and big free-tailed bat (Nyctinomops macrotis), all of which are considered California Species of Special Concern (SSC)

Recommendations #1 - CEQA: The Spadra Basin GSP as developed under SGMA is exempt from the California Environmental Quality Act (CEQA). However, project and management actions needed to achieve basin sustainability, such as artificial recharge, are subject to CEQA. CDFW will likely have a CEQA review and permitting nexus with groundwater project and management actions (e.g., Lake and Streambed Alteration Agreements). CDFW will expect CEQA lead agencies

to thoroughly address proposed groundwater management project impacts (i.e., significant effects) to streambed, groundwater dependent ecosystems, interconnected surface waters, as well as fish and wildlife resources that may be within project areas. CDFW recommends including this information in the basin optimization scenarios to ensure project budgets and timelines consider the regulatory process in the implementation of potential projects.

Recommendations #2 – Impacts to rare plants: CDFW recommends impacts to CRPR ranked species as well as locally and regionally sensitive species should be analyzed during preparation of environmental documents relating to CEQA. In preparation of the final GSP, CDFW recommends budgets and timelines include the need for a qualified botanist conduct multiple late summer and fall surveys for San Bernardino aster. In preparation of an environmental document, CDFW recommends the final GSP require projects to submit a rare plant survey according to CDFW's Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities (CDFW 2018). The environmental document should provide full disclosure of the presence/absence of rare plant species so CDFW may assist the project applicant during the public comment period in identifying and mitigating for potential impacts on rare plants. The Project and environmental document should be conditioned to avoid and/or mitigate for potential impacts on rare plants and habitat if rare plants are present.

Recommendation #3 – Impacts to SSC: CDFW considers impacts to SSC a significant direct and cumulative adverse effect without implementing appropriate avoid and/or mitigation measures. Therefore, CDFW recommends the final GSP budget and timeline include the need for focused and timely surveys for SSCs. These focused surveys include but are not limited to the following species, merlin, southern California legless lizard, western yellow bat, and big free-tailed bat. All surveys should be conducted by qualified biologists familiar with each of these species. In preparation of an environmental document, CDFW recommends the final GSP require survey reports to determine the presence/absence of merlin, southern California legless lizard, western yellow bat, big free-tailed bat, and their habitat. Surveys should be conducted during a time of day and year when these species are more likely to be detected. Depending on the survey results, the environmental document should provide measures to avoid and/or mitigate for potential impacts on individuals of these species as well as habitat

Recommendation #4 – Consideration of biological baseline assessment and impact analysis: CDFW recommends the final GSP include in the budget and timeline that projects will need to provide a complete assessment and impact analysis of the flora and fauna within and adjacent to project areas. This assessment should emphasize upon identifying endangered, threatened, sensitive, regionally, and locally unique species, and sensitive habitats. Impact analysis will aid in determining any direct, indirect, and cumulative biological impacts, as well as specific mitigation or avoidance measures necessary to offset those impacts.

Response to Comment #3. Thank you for providing guidance on the types of biological resources monitoring that may be necessary pursuant to CEQA. The projects implemented for the Spadra

Basin GSP will be evaluated through the appropriate CEQA analyses, including the necessary analyses for potential impacts to biological resources. The cost and schedule to perform CEQA analyses will be considered in the project budgets and timelines.

Appendix B

Cost Model for the Baseline Scenario

Table B-1a. Baseline Scenario Water Supply Plan -- City of Pomona

Year	Total Water Demands	Water Supply Plan										
		Potable							Non-Potable			
		Groundwater				Surface Water						
		Chino Basin	Six Basins	Spadra Basin	Total	San Antonio Creek Water	Imported Water	Total	Spadra Basin	Recycled Water	Total	Total Supplies
2019	19,708	10,348	1,984	0	12,332	2,614	3,331	18,277	0	1,431	1,431	19,708
2020	23,492	11,509	3,300	0	14,809	1,950	4,390	21,149	0	2,343	2,343	23,492
2021	23,569	11,416	3,300	0	14,716	1,950	4,390	21,056	200	2,313	2,513	23,569
2022	23,646	11,323	3,300	0	14,623	1,950	4,390	20,963	400	2,283	2,683	23,646
2023	23,724	11,231	3,300	0	14,531	1,950	4,390	20,871	600	2,253	2,853	23,724
2024	23,801	11,138	3,300	0	14,438	1,950	4,390	20,778	800	2,223	3,023	23,801
2025	23,878	11,045	3,300	0	14,345	1,950	4,390	20,685	1,000	2,193	3,193	23,878
2026	23,833	11,062	3,300	0	14,362	1,950	4,390	20,702	969	2,162	3,131	23,833
2027	23,788	11,079	3,300	0	14,379	1,950	4,390	20,719	938	2,131	3,069	23,788
2028	23,744	11,097	3,300	0	14,397	1,950	4,390	20,737	907	2,100	3,007	23,744
2029	23,699	11,114	3,300	0	14,414	1,950	4,390	20,754	876	2,069	2,945	23,699
2030	23,654	11,131	3,300	0	14,431	1,950	4,390	20,771	845	2,038	2,883	23,654
2031	23,671	11,148	3,300	0	14,448	1,950	4,390	20,788	845	2,038	2,883	23,671
2032	23,689	11,166	3,300	0	14,466	1,950	4,390	20,806	845	2,038	2,883	23,689
2033	23,706	11,183	3,300	0	14,483	1,950	4,390	20,823	845	2,038	2,883	23,706
2034	23,724	11,201	3,300	0	14,501	1,950	4,390	20,841	845	2,038	2,883	23,724
2035	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2036	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2037	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2038	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2039	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2040	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2041	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2042	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2043	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2044	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2045	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2046	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2047	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2048	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2049	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2050	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2051	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2052	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2053	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2054	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2055	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2056	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2057	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2058	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2059	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2060	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2061	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2062	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2063	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2064	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2065	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2066	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2067	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2068	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2069	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2070	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2071	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741
2072	23,741	11,218	3,300	0	14,518	1,950	4,390	20,858	845	2,038	2,883	23,741

Table B-1b. Baseline Scenario Water Supply Plan -- Walnut Valley Water District

Year	Total Water Demands	Water Supply Plan											
		Potable								Non-Potable			
		Groundwater						Surface Water					
		Puente Basin	Six Basins	Spadra Basin	Main San Gabriel	Central Basin	Total	Imported Water	Total	Spadra Basin	Recycled Water	Total	Total Supplies
2019	17,595	662	0	0	0	0	662	15,795	16,457	53	1,085	1,138	17,595
2020	21,191	1,359	0	0	0	0	1,359	17,518	18,877	110	2,204	2,314	21,191
2021	21,154	1,345	0	0	0	0	1,345	17,518	18,863	109	2,182	2,291	21,154
2022	21,117	1,332	625	0	0	0	1,957	16,893	18,850	108	2,160	2,268	21,117
2023	21,081	1,318	625	0	0	0	1,943	16,893	18,836	107	2,137	2,244	21,081
2024	21,044	1,305	625	0	0	0	1,930	16,893	18,823	106	2,115	2,221	21,044
2025	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2026	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2027	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2028	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2029	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2030	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2031	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2032	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2033	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2034	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2035	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2036	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2037	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2038	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2039	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2040	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2041	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2042	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2043	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2044	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2045	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2046	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2047	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2048	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2049	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2050	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2051	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2052	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2053	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2054	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2055	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2056	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2057	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2058	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2059	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2060	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2061	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2062	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2063	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2064	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2065	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2066	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2067	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2068	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2069	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2070	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2071	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007
2072	21,007	1,291	625	0	2,500	2,000	6,416	12,393	18,809	105	2,093	2,198	21,007

Table B-1c. Baseline Scenario Water Supply Plan -- Cal Poly Pomona

Year	Total Water Demands	Water Supply Plan						
		Potable			Non-Potable			
		Groundwater	Surface Water					
		Spadra Basin	Imported Water	Total	Spadra Basin	Recycled Water	Total	Total Supplies
2019	1,824	312	105	417	0	984	984	1,401
2020	1,621	235	118	354	0	911	911	1,265
2021	1,669	312	103	415	324	929	1,253	1,669
2022	1,716	312	88	400	370	947	1,316	1,716
2023	1,764	312	73	385	415	964	1,379	1,764
2024	1,812	355	58	413	417	982	1,399	1,812
2025	1,860	389	43	432	428	1,000	1,428	1,860
2026	1,861	389	36	425	436	1,000	1,436	1,861
2027	1,862	389	29	418	443	1,000	1,443	1,862
2028	1,863	389	23	412	451	1,000	1,451	1,863
2029	1,864	410	16	426	438	1,000	1,438	1,864
2030	1,865	426	9	435	430	1,000	1,430	1,865
2031	1,865	426	9	435	430	1,000	1,430	1,865
2032	1,865	426	9	435	430	1,000	1,430	1,865
2033	1,865	426	9	435	430	1,000	1,430	1,865
2034	1,865	426	9	435	430	1,000	1,430	1,865
2035	1,865	426	9	435	430	1,000	1,430	1,865
2036	1,865	426	9	435	430	1,000	1,430	1,865
2037	1,865	426	9	435	430	1,000	1,430	1,865
2038	1,865	426	9	435	430	1,000	1,430	1,865
2039	1,865	426	9	435	430	1,000	1,430	1,865
2040	1,865	426	9	435	430	1,000	1,430	1,865
2041	1,865	426	9	435	430	1,000	1,430	1,865
2042	1,865	426	9	435	430	1,000	1,430	1,865
2043	1,865	426	9	435	430	1,000	1,430	1,865
2044	1,865	426	9	435	430	1,000	1,430	1,865
2045	1,865	426	9	435	430	1,000	1,430	1,865
2046	1,865	426	9	435	430	1,000	1,430	1,865
2047	1,865	426	9	435	430	1,000	1,430	1,865
2048	1,865	426	9	435	430	1,000	1,430	1,865
2049	1,865	426	9	435	430	1,000	1,430	1,865
2050	1,865	426	9	435	430	1,000	1,430	1,865
2051	1,865	426	9	435	430	1,000	1,430	1,865
2052	1,865	426	9	435	430	1,000	1,430	1,865
2053	1,865	426	9	435	430	1,000	1,430	1,865
2054	1,865	426	9	435	430	1,000	1,430	1,865
2055	1,865	426	9	435	430	1,000	1,430	1,865
2056	1,865	426	9	435	430	1,000	1,430	1,865
2057	1,865	426	9	435	430	1,000	1,430	1,865
2058	1,865	426	9	435	430	1,000	1,430	1,865
2059	1,865	426	9	435	430	1,000	1,430	1,865
2060	1,865	426	9	435	430	1,000	1,430	1,865
2061	1,865	426	9	435	430	1,000	1,430	1,865
2062	1,865	426	9	435	430	1,000	1,430	1,865
2063	1,865	426	9	435	430	1,000	1,430	1,865
2064	1,865	426	9	435	430	1,000	1,430	1,865
2065	1,865	426	9	435	430	1,000	1,430	1,865
2066	1,865	426	9	435	430	1,000	1,430	1,865
2067	1,865	426	9	435	430	1,000	1,430	1,865
2068	1,865	426	9	435	430	1,000	1,430	1,865
2069	1,865	426	9	435	430	1,000	1,430	1,865
2070	1,865	426	9	435	430	1,000	1,430	1,865
2071	1,865	426	9	435	430	1,000	1,430	1,865
2072	1,865	426	9	435	430	1,000	1,430	1,865

Table B-2a. Unit and Melded Costs for Water Supplies -- City of Pomona

	Groundwater												Surface Water								Total Annual Cost						Unit Cost						
	Chino Basin				Six Basins				Spadra Basin				San Antonio Canyon Water				Imported Water		Recycled Water														
Year	Assessment	Production	Treatment	O&M	Assessment	Production	Treatment	O&M	Assessment	Production	Treatment	O&M	Assessment	Production	Treatment	O&M	Tier 1	Other	Commodity	Production	Chino Basin	Six Basins	Spadra Basin	SAC Water	Imported Water	Recycled Water	Chino Basin	Six Basins	Spadra Basin	SAC Water	Imported Water	Recycled Water	Melded Total
2021	$129	$86	$120	$164	$24	$86	$21	$164	$0	$105	$78	$103	$494	$86	$7	$164	$1,104	$7	$134	$38	$5,693,601	$973,038	$57,070	$1,464,587	$4,878,607	$397,743	$499	$295	$285	$751	$1,111	$172	$571
2022	$132	$88	$123	$169	$25	$88	$21	$169	$0	$107	$80	$106	$506	$88	$7	$169	$1,143	$7	$137	$39	$5,788,502	$997,364	$116,993	$1,501,201	$5,050,618	$402,399	$511	$302	$292	$770	$1,150	$176	$586
2023	$135	$90	$126	$173	$25	$90	$22	$173	$0	$110	$82	$108	$519	$90	$7	$173	$1,200	$8	$140	$40	$5,884,590	$1,022,298	$179,877	$1,538,731	$5,301,669	$407,039	$524	$310	$300	$789	$1,208	$181	$604
2024	$139	$92	$129	$177	$26	$92	$22	$177	$0	$113	$84	$111	$532	$92	$7	$177	$1,260	$8	$144	$41	$5,981,864	$1,047,855	$245,833	$1,577,199	$5,565,911	$411,660	$537	$318	$307	$809	$1,268	$185	$623
2025	$142	$95	$132	$182	$26	$95	$23	$182	$0	$116	$86	$114	$545	$95	$8	$181	$1,311	$8	$148	$42	$6,080,323	$1,074,052	$314,973	$1,616,629	$5,790,664	$416,257	$551	$325	$315	$829	$1,319	$190	$640
2026	$146	$97	$135	$186	$27	$97	$23	$186	$0	$119	$88	$116	$559	$97	$8	$186	$1,336	$8	$151	$43	$6,242,037	$1,100,903	$312,839	$1,657,045	$5,901,298	$420,632	$564	$334	$323	$850	$1,344	$195	$656
2027	$149	$100	$139	$191	$28	$100	$24	$191	$0	$122	$90	$119	$573	$100	$8	$191	$1,370	$8	$155	$44	$6,408,036	$1,128,426	$310,402	$1,698,471	$6,051,465	$424,966	$578	$342	$331	$871	$1,378	$199	$674
2028	$153	$102	$142	$195	$29	$102	$24	$195	$0	$125	$92	$122	$587	$102	$8	$195	$1,403	$9	$159	$46	$6,578,433	$1,156,636	$307,647	$1,740,933	$6,197,264	$429,253	$593	$350	$339	$893	$1,412	$204	$691
2029	$157	$105	$146	$200	$29	$105	$25	$200	$0	$128	$95	$125	$602	$105	$8	$200	$1,442	$9	$163	$47	$6,753,346	$1,185,552	$304,560	$1,784,456	$6,369,426	$433,490	$608	$359	$348	$915	$1,451	$210	$710
2030	$161	$107	$149	$205	$30	$107	$26	$205	$0	$131	$97	$129	$617	$107	$9	$205	$1,486	$9	$167	$48	$6,932,892	$1,215,191	$301,127	$1,829,068	$6,563,562	$437,670	$623	$368	$356	$938	$1,495	$215	$731
2031	$165	$110	$153	$210	$31	$110	$26	$210	$0	$134	$99	$132	$632	$110	$9	$210	$1,545	$9	$171	$49	$7,117,323	$1,245,571	$308,655	$1,874,795	$6,825,504	$448,611	$638	$377	$365	$961	$1,555	$220	$753
2032	$169	$113	$157	$216	$31	$113	$27	$216	$0	$137	$102	$135	$648	$113	$9	$216	$1,607	$10	$175	$50	$7,306,642	$1,276,710	$316,371	$1,921,664	$7,097,909	$459,827	$654	$387	$374	$985	$1,617	$226	$776
2033	$173	$115	$161	$221	$32	$115	$28	$221	$0	$141	$104	$138	$664	$115	$9	$221	$1,672	$10	$180	$51	$7,500,979	$1,308,628	$324,281	$1,969,706	$7,381,195	$471,322	$671	$397	$384	$1,010	$1,681	$231	$800
2034	$178	$118	$165	$227	$33	$118	$28	$227	$0	$144	$107	$142	$681	$118	$10	$227	$1,738	$10	$184	$53	$7,700,466	$1,341,344	$332,388	$2,018,949	$7,675,796	$483,105	$688	$406	$393	$1,035	$1,748	$237	$824
2035	$182	$121	$169	$232	$34	$121	$29	$232	$0	$148	$110	$145	$698	$121	$10	$232	$1,808	$10	$189	$54	$7,905,240	$1,374,877	$340,697	$2,069,422	$7,982,165	$495,183	$705	$417	$403	$1,061	$1,818	$243	$849
2036	$187	$124	$173	$238	$35	$124	$30	$238	$0	$152	$112	$149	$715	$124	$10	$238	$1,880	$11	$194	$55	$8,102,871	$1,409,249	$349,215	$2,121,158	$8,300,773	$507,563	$722	$427	$413	$1,088	$1,891	$249	$876
2037	$191	$127	$178	$244	$36	$127	$31	$244	$0	$156	$115	$153	$733	$127	$10	$244	$1,955	$11	$198	$57	$8,305,442	$1,444,480	$357,945	$2,174,187	$8,632,108	$520,252	$740	$438	$424	$1,115	$1,966	$255	$903
2038	$196	$131	$182	$250	$37	$131	$31	$250	$0	$159	$118	$157	$752	$131	$11	$250	$2,034	$11	$203	$58	$8,513,079	$1,480,592	$366,894	$2,228,542	$8,976,678	$533,258	$759	$449	$434	$1,143	$2,045	$262	$931
2039	$201	$134	$187	$256	$37	$134	$32	$256	$0	$163	$121	$161	$770	$134	$11	$256	$2,115	$11	$208	$60	$8,725,906	$1,517,607	$376,066	$2,284,255	$9,335,014	$546,589	$778	$460	$445	$1,171	$2,126	$268	$960
2040	$206	$137	$191	$263	$38	$137	$33	$263	$0	$168	$124	$165	$790	$137	$11	$263	$2,200	$12	$214	$61	$8,944,053	$1,555,547	$385,468	$2,341,361	$9,707,665	$560,254	$797	$471	$456	$1,201	$2,211	$275	$990
2041	$211	$141	$196	$269	$39	$141	$34	$269	$0	$172	$127	$169	$809	$141	$11	$269	$2,288	$12	$219	$63	$9,167,654	$1,594,436	$395,104	$2,399,896	$10,095,203	$574,260	$817	$483	$468	$1,231	$2,300	$282	$1,020
2042	$216	$144	$201	$276	$40	$144	$35	$276	$0	$176	$130	$173	$830	$144	$12	$276	$2,379	$12	$225	$64	$9,396,846	$1,634,297	$404,982	$2,459,893	$10,498,223	$588,617	$838	$495	$479	$1,261	$2,391	$289	$1,052
2043	$222	$148	$206	$283	$41	$148	$35	$283	$0	$180	$134	$177	$850	$148	$12	$283	$2,474	$13	$230	$66	$9,631,767	$1,675,154	$415,107	$2,521,390	$10,917,345	$603,332	$859	$508	$491	$1,293	$2,487	$296	$1,085
2044	$227	$151	$211	$290	$42	$151	$36	$290	$0	$185	$137	$182	$872	$151	$12	$290	$2,573	$13	$236	$68	$9,872,561	$1,717,033	$425,484	$2,584,425	$11,353,211	$618,416	$880	$520	$504	$1,325	$2,586	$303	$1,119
2045	$233	$155	$216	$297	$43	$155	$37	$297	$0	$190	$140	$186	$893	$155	$12	$297	$2,676	$13	$242	$69	$10,119,375	$1,759,959	$436,121	$2,649,036	$11,806,491	$633,876	$902	$533	$516	$1,358	$2,689	$311	$1,154
2046	$239	$159	$222	$305	$44	$159	$38	$305	$0	$194	$144	$191	$916	$159	$13	$305	$2,783	$14	$248	$71	$10,372,360	$1,803,958	$447,024	$2,715,261	$12,277,881	$649,723	$925	$547	$529	$1,392	$2,797	$319	$1,191
2047	$245	$163	$227	$312	$46	$163	$39	$312	$0	$199	$147	$196	$939	$163	$13	$312	$2,895	$14	$254	$73	$10,631,669	$1,849,057	$458,200	$2,783,143	$12,768,105	$665,966	$948	$560	$542	$1,427	$2,908	$327	$1,228
2048	$251	$167	$233	$320	$47	$167	$40	$320	$0	$204	$151	$201	$962	$167	$13	$320	$3,010	$14	$260	$75	$10,897,460	$1,895,283	$469,655	$2,852,722	$13,277,916	$682,615	$971	$574	$556	$1,463	$3,025	$335	$1,267
2049	$257	$171	$239	$328	$48	$171	$41	$328	$0	$209	$155	$206	$986	$171	$14	$328	$3,131	$15	$267	$76	$11,169,897	$1,942,666	$481,396	$2,924,040	$13,808,097	$699,681	$996	$589	$570	$1,500	$3,145	$343	$1,307
2050	$264	$176	$245	$337	$49	$176	$42	$337	$0	$214	$159	$211	$1,011	$176	$14	$336	$3,256	$15	$274	$78	$11,449,144	$1,991,232	$493,431	$2,997,141	$14,359,461	$717,173	$1,021	$603	$584	$1,537	$3,271	$352	$1,348
2051	$270	$180	$251	$345	$50	$180	$43	$345	$0	$220	$163	$216	$1,036	$180	$14	$345	$3,386	$15	$280	$80	$11,735,373	$2,041,013	$505,767	$3,072,069	$14,932,855	$735,102	$1,046	$618	$599	$1,575	$3,402	$361	$1,391
2052	$277	$185	$257	$354	$52	$185	$44	$354	$0	$225	$167	$221	$1,062	$185	$15	$353	$3,522	$16	$287	$82	$12,028,757	$2,092,038	$518,411	$3,148,871	$15,529,161	$753,480	$1,072	$634	$614	$1,615	$3,537	$370	$1,435
2053	$284	$189	$264	$362	$53	$189	$45	$362	$0	$231	$171	$227	$1,089	$189	$15	$362	$3,663	$16	$295	$84	$12,329,476	$2,144,339	$531,371	$3,227,593	$16,149,294	$772,316	$1,099	$650	$629	$1,655	$3,679	$379	$1,481
2054	$291	$194	$270	$371	$54	$194	$46	$371	$0	$237	$175	$233	$1,116	$194	$16	$371	$3,809	$16	$302	$86	$12,637,713	$2,197,948	$544,656	$3,308,282	$16,794,207	$791,624	$1,127	$666	$645	$1,697	$3,826	$388	$1,528
2055	$298	$199	$277	$381	$56	$199	$48	$381	$0	$243	$180	$238	$1,144	$199	$16	$381	$3,961	$17	$310	$89	$12,953,656	$2,252,896	$558,272	$3,390,990	$17,464,889	$811,415	$1,155	$683	$661	$1,739	$3,978	$398	$1,577
2056	$306	$204	$284	$390	$57	$204	$49	$390	$0	$249	$184	$244	$1,172	$204	$16	$390	$4,120	$17	$317	$91	$13,277,497	$2,309,219	$572,229	$3,475,764	$18,162,372	$831,700	$1,184	$700	$677	$1,782	$4,137	$408	$1,627
2057	$313	$209	$291	$400	$58	$209	$50	$400	$0	$255	$189	$250	$1,202	$209	$17	$400	$4,285	$18	$325	$93	$13,609,435	$2,366,949	$586,535	$3,562,658	$18,887,726	$852,493	$1,213	$717	$694	$1,827	$4,302	$418	$1,679
2058	$321	$214	$298	$410	$60	$214	$51	$410	$0	$261	$193	$257	$1,232	$214	$17	$410	$4,456	$18	$333	$95	$13,949,670	$2,426,123	$601,198	$3,651,725	$19,642,065	$873,805	$1,244	$735	$711	$1,873	$4,474	$429	$1,733
2059	$329	$219	$306	$420	$61	$219	$53	$420	$0	$268	$198	$263	$1,262	$219	$18	$420	$4,634	$19	$342	$98	$14,298,412	$2,486,776	$616,228	$3,743,018	$20,426,549	$895,650	$1,275	$754	$729	$1,919	$4,653	$439	$1,789
2060	$337	$225	$313	$431	$63	$225	$54	$431	$0	$274	$203	$270	$1,294	$225	$18	$431	$4,820	$19	$350	$100	$14,655,873	$2,548,946	$631,634	$3,836,593	$21,242,383	$918,042	$1,306	$772	$747	$1,967	$4,839	$450	$1,846
2061	$346	$230	$321	$442	$64	$230	$55	$442	$0	$281	$208	$276	$1,326	$230	$19	$441	$5,012	$20	$359	$103	$15,022,269	$2,612,669	$647,425	$3,932,508	$22,090,819	$940,993	$1,339	$792	$766	$2,017	$5,032	$462	$1,906
2062	$355	$236	$329	$453	$66	$236	$57	$453	$0	$288	$214	$283	$1,359	$236	$19	$452	$5,213	$20	$368	$105	$15,397,826	$2,677,986	$663,610	$4,030,821	$22,973,161	$964,517	$1,373	$812	$785	$2,067	$5,233	$473	$1,967
2063	$363	$242	$338	$464	$68	$242	$58	$464	$0	$296	$219	$290	$1,393	$242	$19	$464	$5,421	$21	$377	$108	$15,782,772	$2,744,936	$680,200	$4,131,591	$23,890,764	$988,630	$1,407	$832	$805	$2,119	$5,442	$485	$2,031
2064	$372	$248	$346	$475	$69	$248	$60	$475	$0	$303	$224	$298	$1,428	$248	$20	$475	$5,638	$21	$387	$111	$16,177,341	$2,813,559	$697,205	$4,234,881	$24,845,039	$1,013,346	$1,442	$853	$825	$2,172	$5,659	$497	$2,097
2065	$382	$254	$355	$487	$71	$254	$61	$487	$0	$311	$230	$305	$1,464	$254	$20	$487	$5,864	$22	$396	$113	$16,581,775	$2,883,898	$714,636	$4,340,753	$25,837,451	$1,038,680	$1,478	$874	$846	$2,226	$5,886	$510	$2,165
2066	$391	$261	$363	$500	$73	$261	$63	$500	$0	$318	$236	$313	$1,501	$261	$21	$499	$6,098	$22	$406	$116	$16,996,319	$2,955,995	$732,501	$4,449,272	$26,869,524	$1,064,647	$1,515	$896	$867	$2,282	$6,121	$522	$2,235
2067	$401	$267	$373	$512	$75	$267	$64	$512	$0	$326	$242	$321	$1,538	$267	$22	$512	$6,342	$23	$416	$119	$17,421,227	$3,029,895	$750,814	$4,560,504	$27,942,844	$1,091,263	$1,553	$918	$889	$2,339	$6,365	$535	$2,308
2068	$411	$274	$382	$525	$77	$274	$66	$525	$0	$334	$248	$329	$1,577	$274	$22	$525	$6,596	$23	$427	$122	$17,856,758	$3,105,643	$769,584	$4,674,517	$29,059,061	$1,118,545	$1,592	$941	$911	$2,397	$6,619	$549	$2,383
2069	$421	$281	$391	$538	$79	$281	$67	$538	$0	$343	$254	$337	$1,616	$281	$23	$538	$6,860	$24	$437	$125	$18,303,176	$3,183,284	$788,824	$4,791,379	$30,219,890	$1,146,508	$1,632	$965	$934	$2,457	$6,884	$563	$2,461
2070	$432	$288	$401	$551	$80	$288	$69	$551	$0	$351	$260	$345	$1,656	$288	$23	$551	$7,134	$24	$448	$128	$18,760,756	$3,262,866	$808,544	$4,911,164	$31,427,113	$1,175,171	$1,672	$989	$957	$2,519	$7,159	$577	$2,542
2071	$443	$295	$411	$565	$82	$295	$71	$565	$0	$360	$267	$354	$1,698	$295	$24	$565	$7,420	$25	$459	$132	$19,229,775	$3,344,437	$828,758	$5,033,943	$32,682,585	$1,204,550	$1,714	$1,013	$981	$2,582	$7,445	$591	$2,625
2072	$454	$302	$421	$579	$85	$302	$73	$579	$0	$369	$273	$363	$1,740	$302	$24	$579	$7,716	$26	$471	$135	$19,710,519	$3,428,048	$849,477	$5,159,792	$33,988,236	$1,234,664	$1,757	$1,039	$1,005	$2,646	$7,742	$606	$2,711

Table B-2b. Unit and Melded Costs for Water Supplies -- Walnut Valley Water District

	Groundwater																								Surface Water			Recycled Water			Total Annual Cost								Unit Cost							
	Puente Basin				Six Basins				Spadra Basin				Main San Gabriel Basin				Central Basin								Imported Water																					
Year	Assessment	Production	Treatment	O&M	Assessment	Production	Treatment	O&M	Assessment	Production	Treatment	O&M	Assessment	Production	Treatment	O&M	Untreated Tier 1 Water	Assessment	Production	Treatment	O&M	Other	Tier 1	O&M	Surcharge	Assessment	Production	Treatment	O&M	Puente Basin	Six Basins	Spadra Basin	Main San Gabriel Basin	Central Basin	Imported Water	Recycled Water	Puente Basin	Six Basins	Spadra Basin	Main San Gabriel Basin	Central Basin	Imported Water	Recycled Water	Melded Total
2021	$0	$65	$0	$0	$772	$100	$0	$30	$0	$65	$0	$0	$200	$89	$391	$45	$594	$532	$230	$15	$34	$228	$1,104	$9	($6)	$150	$68	$0	$0	$87,451	$106,102	$7,085	$0	$0	$19,392,426	$475,632	$65		$65			$1,107	$218	$1,141
2022	$0	$67	$0	$0	$796	$103	$0	$31	$0	$67	$0	$0	$205	$91	$401	$46	$618	$545	$236	$15	$35	$234	$1,143	$9	($6)	$154	$70	$0	$0	$88,731	$687,024	$7,196	$0	$0	$19,360,645	$482,563		$1,099	$67			$1,146	$223	$973
2023	$0	$68	$0	$0	$822	$105	$0	$32	$0	$68	$0	$0	$210	$94	$411	$47	$642	$559	$242	$16	$36	$240	$1,200	$9	($6)	$158	$71	$0	$0	$90,021	$705,137	$7,307	$0	$0	$20,324,845	$489,542	$68	$1,128	$68			$1,203	$229	$1,022
2024	$0	$70	$0	$0	$849	$108	$0	$32	$0	$70	$0	$0	$215	$96	$421	$48	$668	$573	$248	$16	$37	$246	$1,260	$10	($6)	$162	$73	$0	$0	$91,319	$724,146	$7,420	$0	$0	$21,339,756	$496,569	$70	$1,159	$70			$1,263	$235	$1,073
2025	$0	$72	$0	$0	$872	$110	$0	$33	$0	$72	$0	$0	$221	$98	$432	$50	$695	$587	$254	$17	$38	$252	$1,311	$10	($7)	$166	$75	$0	$0	$92,626	$740,677	$7,534	$2,000,661	$2,293,723	$16,288,262	$503,641	$72	$1,185	$72	$800	$1,147	$1,314	$241	$1,040
2026	$0	$74	$0	$0	$883	$113	$0	$34	$0	$74	$0	$0	$226	$101	$442	$51	$723	$602	$260	$17	$38	$258	$1,336	$10	($7)	$170	$77	$0	$0	$94,942	$749,951	$7,722	$2,050,677	$2,351,066	$16,599,113	$516,232	$74	$1,200	$74	$820	$1,176	$1,339	$247	$1,063
2027	$0	$75	$0	$0	$898	$115	$0	$35	$0	$75	$0	$0	$232	$103	$453	$52	$752	$617	$267	$17	$39	$264	$1,370	$10	($7)	$174	$79	$0	$0	$97,316	$761,811	$7,915	$2,101,944	$2,409,841	$17,021,526	$529,138	$75	$1,219	$75	$841	$1,205	$1,373	$253	$1,092
2028	$0	$77	$0	$0	$913	$119	$0	$36	$0	$77	$0	$0	$238	$106	$465	$53	$782	$632	$273	$18	$40	$271	$1,403	$11	($7)	$178	$81	$0	$0	$99,749	$773,448	$8,113	$2,154,493	$2,470,089	$17,431,573	$542,366	$77	$1,238	$77	$862	$1,235	$1,407	$259	$1,118
2029	$0	$79	$0	$0	$931	$122	$0	$37	$0	$79	$0	$0	$244	$108	$476	$55	$813	$648	$280	$18	$41	$278	$1,442	$11	($7)	$183	$83	$0	$0	$102,242	$786,832	$8,316	$2,208,355	$2,531,841	$17,916,005	$555,926	$79	$1,259	$79	$883	$1,266	$1,446	$266	$1,148
2030	$0	$81	$0	$0	$951	$125	$0	$37	$0	$81	$0	$0	$250	$111	$488	$56	$845	$664	$287	$19	$42	$285	$1,486	$11	($7)	$187	$85	$0	$0	$104,798	$801,681	$8,523	$2,263,564	$2,595,137	$18,462,429	$569,824	$81	$1,283	$81	$905	$1,298	$1,490	$272	$1,181
2031	$0	$83	$0	$0	$977	$128	$0	$38	$0	$83	$0	$0	$256	$114	$501	$58	$879	$681	$294	$19	$44	$292	$1,545	$12	($8)	$192	$87	$0	$0	$107,418	$820,936	$8,737	$2,320,153	$2,660,016	$19,200,230	$584,069	$83	$1,313	$83	$928	$1,330	$1,549	$279	$1,223
2032	$0	$85	$0	$0	$1,005	$131	$0	$39	$0	$85	$0	$0	$262	$117	$513	$59	$914	$698	$302	$20	$45	$299	$1,607	$12	($8)	$197	$89	$0	$0	$110,104	$840,922	$8,955	$2,378,157	$2,726,516	$19,967,526	$598,671	$85	$1,345	$85	$951	$1,363	$1,611	$286	$1,268
2033	$0	$87	$0	$0	$1,034	$134	$0	$40	$0	$87	$0	$0	$269	$120	$526	$61	$951	$715	$309	$20	$46	$307	$1,672	$12	($8)	$202	$91	$0	$0	$112,856	$861,669	$9,179	$2,437,611	$2,794,679	$20,765,495	$613,638	$87	$1,379	$87	$975	$1,397	$1,676	$293	$1,314
2034	$0	$90	$0	$0	$1,064	$138	$0	$41	$0	$90	$0	$0	$276	$123	$539	$62	$989	$733	$317	$21	$47	$314	$1,738	$12	($8)	$207	$94	$0	$0	$115,678	$883,206	$9,408	$2,498,551	$2,864,546	$21,595,365	$628,979	$90	$1,413	$90	$999	$1,432	$1,743	$301	$1,361
2035	$0	$92	$0	$0	$1,095	$141	$0	$42	$0	$92	$0	$0	$283	$126	$552	$64	$1,029	$752	$325	$21	$48	$322	$1,808	$13	($8)	$212	$96	$0	$0	$118,570	$905,563	$9,644	$2,561,015	$2,936,160	$22,458,410	$644,703	$92	$1,449	$92	$1,024	$1,468	$1,812	$308	$1,411
2036	$0	$94	$0	$0	$1,128	$145	$0	$43	$0	$94	$0	$0	$290	$129	$566	$65	$1,070	$770	$333	$22	$49	$330	$1,880	$13	($9)	$217	$98	$0	$0	$121,534	$928,772	$9,885	$2,625,040	$3,009,564	$23,355,959	$660,821	$94	$1,486	$94	$1,050	$1,505	$1,885	$316	$1,462
2037	$0	$96	$0	$0	$1,162	$148	$0	$45	$0	$96	$0	$0	$297	$132	$580	$67	$1,113	$790	$341	$22	$50	$338	$1,955	$13	($9)	$223	$101	$0	$0	$124,572	$952,867	$10,132	$2,690,666	$3,084,803	$24,289,389	$677,341	$96	$1,525	$96	$1,076	$1,542	$1,960	$324	$1,515
2038	$0	$99	$0	$0	$1,197	$152	$0	$46	$0	$99	$0	$0	$304	$135	$595	$68	$1,157	$810	$350	$23	$52	$347	$2,034	$14	($9)	$228	$103	$0	$0	$127,687	$977,882	$10,385	$2,757,933	$3,161,923	$25,260,137	$694,275	$99	$1,565	$99	$1,103	$1,581	$2,038	$332	$1,570
2039	$0	$101	$0	$0	$1,234	$156	$0	$47	$0	$101	$0	$0	$312	$139	$610	$70	$1,203	$830	$359	$23	$53	$356	$2,115	$14	($9)	$234	$106	$0	$0	$130,879	$1,003,852	$10,645	$2,826,881	$3,240,971	$26,269,694	$711,632	$101	$1,606	$101	$1,131	$1,620	$2,120	$340	$1,628
2040	$0	$104	$0	$0	$1,272	$160	$0	$48	$0	$104	$0	$0	$320	$142	$625	$72	$1,251	$850	$368	$24	$54	$364	$2,200	$14	($10)	$240	$109	$0	$0	$134,151	$1,030,814	$10,911	$2,897,553	$3,321,995	$27,319,612	$729,423	$104	$1,649	$104	$1,159	$1,661	$2,204	$349	$1,687
2041	$0	$107	$0	$0	$1,311	$164	$0	$49	$0	$107	$0	$0	$328	$146	$641	$74	$1,302	$872	$377	$25	$56	$374	$2,288	$15	($10)	$246	$111	$0	$0	$137,504	$1,058,807	$11,184	$2,969,992	$3,405,045	$28,411,505	$747,658	$107	$1,694	$107	$1,188	$1,703	$2,293	$357	$1,749
2042	$0	$109	$0	$0	$1,352	$168	$0	$50	$0	$109	$0	$0	$336	$149	$657	$76	$1,354	$894	$386	$25	$57	$383	$2,379	$15	($10)	$252	$114	$0	$0	$140,942	$1,087,871	$11,463	$3,044,242	$3,490,171	$29,547,051	$766,350	$109	$1,741	$109	$1,218	$1,745	$2,384	$366	$1,813
2043	$0	$112	$0	$0	$1,395	$172	$0	$52	$0	$112	$0	$0	$344	$153	$673	$77	$1,408	$916	$396	$26	$59	$393	$2,474	$15	($10)	$258	$117	$0	$0	$144,466	$1,118,048	$11,750	$3,120,348	$3,577,425	$30,727,997	$785,508	$112	$1,789	$112	$1,248	$1,789	$2,479	$375	$1,880
2044	$0	$115	$0	$0	$1,440	$176	$0	$53	$0	$115	$0	$0	$353	$157	$690	$79	$1,464	$939	$406	$26	$60	$402	$2,573	$16	($11)	$265	$120	$0	$0	$148,077	$1,149,381	$12,043	$3,198,357	$3,666,861	$31,956,156	$805,146	$115	$1,839	$115	$1,279	$1,833	$2,579	$385	$1,949
2045	$0	$118	$0	$0	$1,486	$181	$0	$54	$0	$118	$0	$0	$362	$161	$707	$81	$1,523	$962	$416	$27	$61	$412	$2,676	$16	($11)	$271	$123	$0	$0	$151,779	$1,181,915	$12,345	$3,278,316	$3,758,533	$33,233,419	$825,275	$118	$1,891	$118	$1,311	$1,879	$2,682	$394	$2,020
2046	$0	$121	$0	$0	$1,534	$185	$0	$56	$0	$121	$0	$0	$371	$165	$725	$83	$1,584	$986	$426	$28	$63	$423	$2,783	$17	($11)	$278	$126	$0	$0	$155,574	$1,215,696	$12,653	$3,360,274	$3,852,496	$34,561,747	$845,906	$121	$1,945	$121	$1,344	$1,926	$2,789	$404	$2,095
2047	$0	$124	$0	$0	$1,584	$190	$0	$57	$0	$124	$0	$0	$380	$169	$743	$86	$1,647	$1,011	$437	$29	$65	$433	$2,895	$17	($11)	$285	$129	$0	$0	$159,463	$1,250,773	$12,969	$3,444,281	$3,948,808	$35,943,183	$867,054	$124	$2,001	$124	$1,378	$1,974	$2,900	$414	$2,172
2048	$0	$127	$0	$0	$1,637	$195	$0	$58	$0	$127	$0	$0	$390	$173	$762	$88	$1,713	$1,036	$448	$29	$66	$444	$3,010	$18	($12)	$292	$132	$0	$0	$163,450	$1,287,197	$13,294	$3,530,388	$4,047,528	$37,379,850	$888,731	$127	$2,060	$127	$1,412	$2,024	$3,016	$425	$2,252
2049	$0	$130	$0	$0	$1,691	$200	$0	$60	$0	$130	$0	$0	$399	$178	$781	$90	$1,781	$1,062	$459	$30	$68	$455	$3,131	$18	($12)	$299	$136	$0	$0	$167,536	$1,325,020	$13,626	$3,618,647	$4,148,717	$38,873,958	$910,949	$130	$2,120	$130	$1,447	$2,074	$3,137	$435	$2,335
2050	$0	$133	$0	$0	$1,747	$205	$0	$61	$0	$133	$0	$0	$409	$182	$800	$92	$1,852	$1,089	$471	$31	$70	$467	$3,256	$18	($12)	$307	$139	$0	$0	$171,724	$1,364,297	$13,967	$3,709,113	$4,252,435	$40,427,803	$933,722	$133	$2,183	$133	$1,484	$2,126	$3,262	$446	$2,422
2051	$0	$136	$0	$0	$1,806	$210	$0	$63	$0	$136	$0	$0	$420	$187	$820	$94	$1,927	$1,116	$482	$31	$71	$478	$3,386	$19	($13)	$315	$143	$0	$0	$176,017	$1,405,084	$14,316	$3,801,841	$4,358,745	$42,043,774	$957,066	$136	$2,248	$136	$1,521	$2,179	$3,393	$457	$2,511
2052	$0	$140	$0	$0	$1,867	$215	$0	$65	$0	$140	$0	$0	$430	$191	$841	$97	$2,004	$1,144	$495	$32	$73	$490	$3,522	$19	($13)	$323	$146	$0	$0	$180,418	$1,447,440	$14,674	$3,896,887	$4,467,714	$43,724,355	$980,992	$140	$2,316	$140	$1,559	$2,234	$3,528	$469	$2,604
2053	$0	$143	$0	$0	$1,930	$220	$0	$66	$0	$143	$0	$0	$441	$196	$862	$99	$2,084	$1,172	$507	$33	$75	$502	$3,663	$20	($13)	$331	$150	$0	$0	$184,928	$1,491,426	$15,041	$3,994,309	$4,579,407	$45,472,130	$1,005,517	$143	$2,386	$143	$1,598	$2,290	$3,669	$480	$2,701
2054	$0	$147	$0	$0	$1,996	$226	$0	$68	$0	$147	$0	$0	$452	$201	$883	$102	$2,167	$1,202	$520	$34	$77	$515	$3,809	$20	($14)	$339	$154	$0	$0	$189,551	$1,537,106	$15,417	$4,094,167	$4,693,892	$47,289,786	$1,030,655	$147	$2,459	$147	$1,638	$2,347	$3,816	$492	$2,801
2055	$0	$150	$0	$0	$2,065	$232	$0	$69	$0	$150	$0	$0	$463	$206	$905	$104	$2,254	$1,232	$533	$35	$79	$528	$3,961	$21	($14)	$347	$157	$0	$0	$194,290	$1,584,547	$15,802	$4,196,521	$4,811,239	$49,180,118	$1,056,421	$150	$2,535	$150	$1,679	$2,406	$3,968	$505	$2,906
2056	$0	$154	$0	$0	$2,136	$237	$0	$71	$0	$154	$0	$0	$475	$211	$928	$107	$2,344	$1,263	$546	$36	$81	$541	$4,120	$21	($14)	$356	$161	$0	$0	$199,148	$1,633,816	$16,197	$4,301,434	$4,931,520	$51,146,031	$1,082,832	$154	$2,614	$154	$1,721	$2,466	$4,127	$517	$3,014
2057	$0	$158	$0	$0	$2,210	$243	$0	$73	$0	$158	$0	$0	$487	$216	$951	$109	$2,438	$1,294	$559	$36	$83	$555	$4,285	$22	($15)	$365	$165	$0	$0	$204,126	$1,684,985	$16,602	$4,408,970	$5,054,808	$53,190,549	$1,109,903	$158	$2,696	$158	$1,764	$2,527	$4,292	$530	$3,126
2058	$0	$162	$0	$0	$2,287	$249	$0	$75	$0	$162	$0	$0	$499	$222	$975	$112	$2,535	$1,326	$573	$37	$85	$568	$4,456	$22	($15)	$374	$170	$0	$0	$209,229	$1,738,129	$17,017	$4,519,195	$5,181,179	$55,316,815	$1,137,650	$162	$2,781	$162	$1,808	$2,591	$4,464	$544	$3,243
2059	$0	$166	$0	$0	$2,367	$256	$0	$77	$0	$166	$0	$0	$511	$227	$999	$115	$2,637	$1,360	$588	$38	$87	$583	$4,634	$23	($15)	$383	$174	$0	$0	$214,460	$1,793,324	$17,443	$4,632,174	$5,310,708	$57,528,097	$1,166,091	$166	$2,869	$166	$1,853	$2,655	$4,642	$557	$3,364
2060	$0	$170	$0	$0	$2,451	$262	$0	$79	$0	$170	$0	$0	$524	$233	$1,024	$118	$2,742	$1,394	$603	$39	$89	$597	$4,820	$24	($16)	$393	$178	$0	$0	$219,822	$1,850,652	$17,879	$4,747,979	$5,443,476	$59,827,795	$1,195,244	$170	$2,961	$170	$1,899	$2,722	$4,828	$571	$3,489
2061	$0	$175	$0	$0	$2,537	$269	$0	$81	$0	$175	$0	$0	$537	$239	$1,050	$121	$2,852	$1,428	$618	$40	$91	$612	$5,012	$24	($16)	$403	$183	$0	$0	$225,317	$1,910,194	$18,326	$4,866,678	$5,579,563	$62,219,446	$1,225,125	$175	$3,056	$175	$1,947	$2,790	$5,021	$585	$3,620
2062	$0	$179	$0	$0	$2,628	$275	$0	$83	$0	$179	$0	$0	$550	$245	$1,076	$124	$2,964	$1,464	$633	$41	$94	$627	$5,213	$25	($17)	$413	$187	$0	$0	$230,950	$1,972,039	$18,784	$4,988,345	$5,719,052	$64,708,487	$1,255,753	$179	$3,155	$179	$1,995	$2,860	$5,221	$600	$3,755
2063	$0	$183	$0	$0	$2,722	$282	$0	$85	$0	$183	$0	$0	$564	$251	$1,103	$127	$3,085	$1,501	$649	$42	$96	$643	$5,421	$25	($17)	$423	$192	$0	$0	$236,724	$2,036,275	$19,253	$5,113,054	$5,862,028	$67,293,461	$1,287,147	$183	$3,258	$183	$2,045	$2,931	$5,430	$615	$3,896
2064	$0	$188	$0	$0	$2,819	$289	$0	$87	$0	$188	$0	$0	$578	$257	$1,131	$130	$3,208	$1,538	$665	$43	$98	$659	$5,638	$26	($17)	$434	$197	$0	$0	$242,642	$2,102,997	$19,735	$5,240,880	$6,008,579	$69,983,626	$1,319,325	$188	$3,365	$188	$2,096	$3,004	$5,647	$630	$4,042
2065	$0	$193	$0	$0	$2,921	$296	$0	$89	$0	$193	$0	$0	$593	$264	$1,159	$133	$3,336	$1,577	$682	$44	$101	$676	$5,864	$27	($18)	$445	$202	$0	$0	$248,708	$2,172,302	$20,228	$5,371,902	$6,158,793	$72,781,358	$1,352,309	$193	$3,476	$193	$2,149	$3,079	$5,873	$646	$4,194
2066	$0	$197	$0	$0	$3,026	$304	$0	$91	$0	$197	$0	$0	$608	$270	$1,188	$137	$3,470	$1,616	$699	$46	$103	$693	$6,098	$27	($18)	$456	$207	$0	$0	$254,926	$2,244,291	$20,734	$5,506,200	$6,312,763	$75,690,960	$1,386,116	$197	$3,591	$197	$2,202	$3,156	$6,108	$662	$4,352
2067	$0	$202	$0	$0	$3,136	$311	$0	$93	$0	$202	$0	$0	$623	$277	$1,218	$140	$3,608	$1,657	$716	$47	$106	$710	$6,342	$28	($19)	$467	$212	$0	$0	$261,299	$2,319,069	$21,252	$5,643,855	$6,470,582	$78,716,904	$1,420,769	$202	$3,711	$202	$2,258	$3,235	$6,352	$679	$4,515
2068	$0	$207	$0	$0	$3,250	$319	$0	$96	$0	$207	$0	$0	$638	$284	$1,248	$144	$3,753	$1,698	$734	$48	$109	$728	$6,596	$29	($19)	$479	$217	$0	$0	$267,831	$2,396,746	$21,783	$5,784,951	$6,632,347	$81,863,844	$1,456,288	$207	$3,835	$207	$2,314	$3,316	$6,606	$696	$4,685
2069	$0	$213	$0	$0	$3,369	$327	$0	$98	$0	$213	$0	$0	$654	$291	$1,279	$147	$3,903	$1,740	$752	$49	$111	$746	$6,860	$29	($20)	$491	$222	$0	$0	$274,527	$2,477,435	$22,328	$5,929,575	$6,798,155	$85,136,618	$1,492,696	$213	$3,964	$213	$2,372	$3,399	$6,870	$713	$4,862
2070	$0	$218	$0	$0	$3,492	$335	$0	$101	$0	$218	$0	$0	$671	$298	$1,311	$151	$4,059	$1,784	$771	$50	$114	$765	$7,134	$30	($20)	$503	$228	$0	$0	$281,396	$2,561,254	$22,886	$6,077,814	$6,968,109	$88,540,258	$1,530,013	$218	$4,098	$218	$2,431	$3,484	$7,144	$731	$5,045
2071	$0	$223	$0	$0	$3,621	$344	$0	$103	$0	$223	$0	$0	$687	$306	$1,344	$155	$4,221	$1,829	$791	$52	$117	$784	$7,420	$31	($21)	$516	$234	$0	$0	$288,425	$2,648,327	$23,458	$6,229,760	$7,142,312	$92,079,998	$1,568,263	$223	$4,237	$223	$2,492	$3,571	$7,430	$749	$5,235
2072	$0	$229	$0	$0	$3,754	$352	$0	$106	$0	$229	$0	$0	$705	$314	$1,378	$159	$4,390	$1,874	$810	$53	$120	$803	$7,716	$32	($21)	$528	$240	$0	$0	$295,636	$2,738,780	$24,045	$6,385,504	$7,320,870	$95,761,281	$1,607,470	$229	$4,382	$229	$2,554	$3,660	$7,727	$768	$5,433

Table B-2c. Unit and Melded Costs for Water Supplies -- Cal Poly Pomona

	Groundwater				Surface Water		Non-Potable Water							Total Annual Cost			Unit Cost			
	Spadra Basin				Imported Water		Spadra Basin			Recycled Water										
Year	Assessment	Production	Treatment	O&M	Tier 1	Other	Assessment	Production	O&M	Assessment	Production	Treatment	O&M	Spadra Basin	Imported Water	Recycled Water	Spadra Basin	Imported Water	Recycled Water	Melded Total
2021	$0	$54	$1,760	$0	$1,104	$49	$0	$54	$0	$606	$49	$0	$0	$583,233	$119,084	$608,409	$916	$1,153	$655	$786
2022	$0	$55	$1,804	$0	$1,143	$50	$0	$55	$0	$622	$50	$0	$0	$600,288	$105,252	$635,569	$881	$1,193	$671	$781
2023	$0	$56	$1,849	$0	$1,200	$51	$0	$56	$0	$637	$51	$0	$0	$617,831	$91,525	$663,707	$850	$1,251	$688	$778
2024	$0	$58	$1,895	$0	$1,260	$52	$0	$58	$0	$653	$52	$0	$0	$717,414	$76,219	$692,854	$930	$1,312	$705	$820
2025	$0	$59	$1,943	$0	$1,311	$54	$0	$59	$0	$669	$54	$0	$0	$804,028	$58,678	$723,044	$984	$1,365	$723	$853
2026	$0	$61	$1,991	$0	$1,336	$55	$0	$61	$0	$686	$55	$0	$0	$824,604	$50,353	$741,121	$1,000	$1,391	$741	$869
2027	$0	$62	$2,041	$0	$1,370	$56	$0	$62	$0	$703	$56	$0	$0	$845,706	$41,934	$759,649	$1,016	$1,426	$760	$885
2028	$0	$64	$2,092	$0	$1,403	$58	$0	$64	$0	$721	$58	$0	$0	$867,348	$33,013	$778,640	$1,032	$1,461	$779	$901
2029	$0	$65	$2,144	$0	$1,442	$59	$0	$65	$0	$739	$59	$0	$0	$933,934	$23,719	$798,106	$1,101	$1,501	$798	$942
2030	$0	$67	$2,198	$0	$1,486	$61	$0	$67	$0	$757	$61	$0	$0	$993,634	$13,920	$818,058	$1,161	$1,547	$818	$979
2031	$0	$69	$2,253	$0	$1,545	$62	$0	$69	$0	$776	$62	$0	$0	$1,018,475	$14,469	$838,510	$1,190	$1,608	$839	$1,004
2032	$0	$70	$2,309	$0	$1,607	$64	$0	$70	$0	$796	$64	$0	$0	$1,043,937	$15,039	$859,473	$1,220	$1,671	$859	$1,029
2033	$0	$72	$2,367	$0	$1,672	$65	$0	$72	$0	$816	$65	$0	$0	$1,070,036	$15,632	$880,959	$1,250	$1,737	$881	$1,055
2034	$0	$74	$2,426	$0	$1,738	$67	$0	$74	$0	$836	$67	$0	$0	$1,096,787	$16,248	$902,983	$1,281	$1,805	$903	$1,081
2035	$0	$76	$2,487	$0	$1,808	$69	$0	$76	$0	$857	$69	$0	$0	$1,124,206	$16,889	$925,558	$1,313	$1,877	$926	$1,108
2036	$0	$78	$2,549	$0	$1,880	$70	$0	$78	$0	$878	$70	$0	$0	$1,152,311	$17,556	$948,697	$1,346	$1,951	$949	$1,136
2037	$0	$80	$2,613	$0	$1,955	$72	$0	$80	$0	$900	$72	$0	$0	$1,181,119	$18,248	$972,414	$1,380	$2,028	$972	$1,165
2038	$0	$82	$2,678	$0	$2,034	$74	$0	$82	$0	$923	$74	$0	$0	$1,210,647	$18,968	$996,725	$1,414	$2,108	$997	$1,194
2039	$0	$84	$2,745	$0	$2,115	$76	$0	$84	$0	$946	$76	$0	$0	$1,240,913	$19,717	$1,021,643	$1,450	$2,191	$1,022	$1,224
2040	$0	$86	$2,814	$0	$2,200	$78	$0	$86	$0	$970	$78	$0	$0	$1,271,936	$20,496	$1,047,184	$1,486	$2,277	$1,047	$1,255
2041	$0	$88	$2,884	$0	$2,288	$80	$0	$88	$0	$994	$80	$0	$0	$1,303,734	$21,305	$1,073,363	$1,523	$2,367	$1,073	$1,286
2042	$0	$90	$2,956	$0	$2,379	$82	$0	$90	$0	$1,019	$82	$0	$0	$1,336,328	$22,146	$1,100,198	$1,561	$2,461	$1,100	$1,318
2043	$0	$92	$3,030	$0	$2,474	$84	$0	$92	$0	$1,044	$84	$0	$0	$1,369,736	$23,021	$1,127,703	$1,600	$2,558	$1,128	$1,352
2044	$0	$95	$3,106	$0	$2,573	$86	$0	$95	$0	$1,070	$86	$0	$0	$1,403,979	$23,931	$1,155,895	$1,640	$2,659	$1,156	$1,385
2045	$0	$97	$3,183	$0	$2,676	$88	$0	$97	$0	$1,097	$88	$0	$0	$1,439,079	$24,877	$1,184,792	$1,681	$2,764	$1,185	$1,420
2046	$0	$99	$3,263	$0	$2,783	$90	$0	$99	$0	$1,124	$90	$0	$0	$1,475,056	$25,860	$1,214,412	$1,723	$2,873	$1,214	$1,456
2047	$0	$102	$3,345	$0	$2,895	$92	$0	$102	$0	$1,152	$92	$0	$0	$1,511,932	$26,882	$1,244,773	$1,766	$2,987	$1,245	$1,493
2048	$0	$104	$3,428	$0	$3,010	$95	$0	$104	$0	$1,181	$95	$0	$0	$1,549,731	$27,945	$1,275,892	$1,811	$3,105	$1,276	$1,530
2049	$0	$107	$3,514	$0	$3,131	$97	$0	$107	$0	$1,211	$97	$0	$0	$1,588,474	$29,050	$1,307,789	$1,856	$3,228	$1,308	$1,569
2050	$0	$110	$3,602	$0	$3,256	$99	$0	$110	$0	$1,241	$99	$0	$0	$1,628,186	$30,199	$1,340,484	$1,902	$3,355	$1,340	$1,608
2051	$0	$112	$3,692	$0	$3,386	$102	$0	$112	$0	$1,272	$102	$0	$0	$1,668,890	$31,393	$1,373,996	$1,950	$3,488	$1,374	$1,648
2052	$0	$115	$3,784	$0	$3,522	$104	$0	$115	$0	$1,304	$104	$0	$0	$1,710,613	$32,635	$1,408,346	$1,999	$3,626	$1,408	$1,690
2053	$0	$118	$3,879	$0	$3,663	$107	$0	$118	$0	$1,337	$107	$0	$0	$1,753,378	$33,926	$1,443,555	$2,049	$3,770	$1,444	$1,732
2054	$0	$121	$3,976	$0	$3,809	$110	$0	$121	$0	$1,370	$110	$0	$0	$1,797,212	$35,269	$1,479,643	$2,100	$3,919	$1,480	$1,776
2055	$0	$124	$4,075	$0	$3,961	$112	$0	$124	$0	$1,404	$112	$0	$0	$1,842,143	$36,665	$1,516,634	$2,152	$4,074	$1,517	$1,821
2056	$0	$127	$4,177	$0	$4,120	$115	$0	$127	$0	$1,439	$115	$0	$0	$1,888,196	$38,116	$1,554,550	$2,206	$4,235	$1,555	$1,867
2057	$0	$130	$4,281	$0	$4,285	$118	$0	$130	$0	$1,475	$118	$0	$0	$1,935,401	$39,626	$1,593,414	$2,261	$4,403	$1,593	$1,913
2058	$0	$134	$4,388	$0	$4,456	$121	$0	$134	$0	$1,512	$121	$0	$0	$1,983,786	$41,195	$1,633,249	$2,318	$4,577	$1,633	$1,962
2059	$0	$137	$4,498	$0	$4,634	$124	$0	$137	$0	$1,550	$124	$0	$0	$2,033,381	$42,826	$1,674,081	$2,376	$4,758	$1,674	$2,011
2060	$0	$140	$4,611	$0	$4,820	$127	$0	$140	$0	$1,589	$127	$0	$0	$2,084,215	$44,522	$1,715,933	$2,435	$4,947	$1,716	$2,062
2061	$0	$144	$4,726	$0	$5,012	$130	$0	$144	$0	$1,628	$130	$0	$0	$2,136,321	$46,286	$1,758,831	$2,496	$5,143	$1,759	$2,113
2062	$0	$147	$4,844	$0	$5,213	$134	$0	$147	$0	$1,669	$134	$0	$0	$2,189,729	$48,120	$1,802,802	$2,558	$5,347	$1,803	$2,167
2063	$0	$151	$4,965	$0	$5,421	$137	$0	$151	$0	$1,711	$137	$0	$0	$2,244,472	$50,027	$1,847,872	$2,622	$5,559	$1,848	$2,221
2064	$0	$155	$5,089	$0	$5,638	$140	$0	$155	$0	$1,754	$140	$0	$0	$2,300,584	$52,009	$1,894,069	$2,688	$5,779	$1,894	$2,277
2065	$0	$159	$5,216	$0	$5,864	$144	$0	$159	$0	$1,797	$144	$0	$0	$2,358,098	$54,071	$1,941,420	$2,755	$6,008	$1,941	$2,334
2066	$0	$163	$5,347	$0	$6,098	$148	$0	$163	$0	$1,842	$148	$0	$0	$2,417,051	$56,214	$1,989,956	$2,824	$6,246	$1,990	$2,393
2067	$0	$167	$5,480	$0	$6,342	$151	$0	$167	$0	$1,888	$151	$0	$0	$2,477,477	$58,443	$2,039,705	$2,895	$6,494	$2,040	$2,454
2068	$0	$171	$5,617	$0	$6,596	$155	$0	$171	$0	$1,936	$155	$0	$0	$2,539,414	$60,760	$2,090,697	$2,967	$6,751	$2,091	$2,515
2069	$0	$175	$5,758	$0	$6,860	$159	$0	$175	$0	$1,984	$159	$0	$0	$2,602,899	$63,169	$2,142,965	$3,041	$7,019	$2,143	$2,579
2070	$0	$180	$5,902	$0	$7,134	$163	$0	$180	$0	$2,034	$163	$0	$0	$2,667,972	$65,675	$2,196,539	$3,117	$7,297	$2,197	$2,644
2071	$0	$184	$6,049	$0	$7,420	$167	$0	$184	$0	$2,085	$167	$0	$0	$2,734,671	$68,280	$2,251,452	$3,195	$7,587	$2,251	$2,710
2072	$0	$189	$6,201	$0	$7,716	$171	$0	$189	$0	$2,137	$171	$0	$0	$2,803,038	$70,988	$2,307,739	$3,275	$7,888	$2,308	$2,779

Table B-3. Total Water Supplies -- Aggregate of All Water Purveyors for the Baseline Scenario

Year	Puente Basin	Chino Basin	Six Basins	Spadra Basin	Main San Gabriel Basin	Central Basin	San Antonio Creek Water	Imported Water	Recycled Water	Total
2021	1,345	11,416	3,300	945	0	0	1,950	22,011	5,424	46,392
2022	1,332	11,323	3,925	1,190	0	0	1,950	21,371	5,389	46,480
2023	1,318	11,231	3,925	1,434	0	0	1,950	21,356	5,355	46,568
2024	1,305	11,138	3,925	1,678	0	0	1,950	21,341	5,320	46,657
2025	1,291	11,045	3,925	1,922	2,500	2,000	1,950	16,826	5,286	46,745
2026	1,291	11,062	3,925	1,899	2,500	2,000	1,950	16,819	5,255	46,701
2027	1,291	11,079	3,925	1,875	2,500	2,000	1,950	16,812	5,224	46,657
2028	1,291	11,097	3,925	1,852	2,500	2,000	1,950	16,806	5,193	46,613
2029	1,291	11,114	3,925	1,829	2,500	2,000	1,950	16,799	5,162	46,570
2030	1,291	11,131	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,526
2031	1,291	11,148	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,543
2032	1,291	11,166	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,561
2033	1,291	11,183	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,578
2034	1,291	11,201	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,596
2035	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2036	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2037	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2038	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2039	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2040	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2041	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2042	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2043	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2044	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2045	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2046	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2047	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2048	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2049	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2050	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2051	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2052	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2053	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2054	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2055	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2056	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2057	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2058	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2059	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2060	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2061	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2062	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2063	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2064	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2065	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2066	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2067	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2068	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2069	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2070	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2071	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2072	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613

Table B-4. Melded Unit Cost -- Aggregate of All Water Purveyors for the Baseline Scenario

	Total Annual Cost									Unit Cost									
Year	Puente Basin	Chino Basin	Six Basins	Spadra Basin	Main San Gabriel Basin	Central Basin	San Antonio Creek Water	Imported Water	Recycled Water	Puente Basin	Chino Basin	Six Basins	Spadra Basin	Main San Gabriel Basin	Central Basin	San Antonio Creek Water	Imported Water	Recycled Water	Melded Total
2021	$87,451	$5,693,601	$1,079,140	$647,388	$0	$0	$1,464,587	$24,390,117	$1,481,785	$65	$499	$327	$685			$751	$1,108	$273	$751
2022	$88,731	$5,788,502	$1,684,388	$724,477	$0	$0	$1,501,201	$24,516,515	$1,520,531	$67	$511	$429	$609			$770	$1,147	$282	$771
2023	$90,021	$5,884,590	$1,727,435	$805,015	$0	$0	$1,538,731	$25,718,039	$1,560,288	$68	$524	$440	$562			$789	$1,204	$291	$801
2024	$91,319	$5,981,864	$1,772,002	$970,666	$0	$0	$1,577,199	$26,981,886	$1,601,083	$70	$537	$451	$579			$809	$1,264	$301	$835
2025	$92,626	$6,080,323	$1,814,729	$1,126,535	$2,000,661	$2,293,723	$1,616,629	$22,137,604	$1,642,943	$72	$551	$462	$586	$800	$1,147	$829	$1,316	$311	$830
2026	$94,942	$6,242,037	$1,850,854	$1,145,165	$2,050,677	$2,351,066	$1,657,045	$22,550,763	$1,677,985	$74	$564	$472	$603	$820	$1,176	$850	$1,341	$319	$848
2027	$97,316	$6,408,036	$1,890,237	$1,164,023	$2,101,944	$2,409,843	$1,698,471	$23,114,925	$1,713,752	$75	$578	$482	$621	$841	$1,205	$871	$1,375	$328	$870
2028	$99,749	$6,578,433	$1,930,085	$1,183,108	$2,154,493	$2,470,089	$1,740,933	$23,661,850	$1,750,260	$77	$593	$492	$639	$862	$1,235	$893	$1,408	$337	$892
2029	$102,242	$6,753,346	$1,972,384	$1,246,809	$2,208,355	$2,531,841	$1,784,456	$24,309,150	$1,787,521	$79	$608	$503	$682	$883	$1,266	$915	$1,447	$346	$917
2030	$104,798	$6,932,892	$2,016,873	$1,303,285	$2,263,564	$2,595,137	$1,829,068	$25,039,912	$1,825,552	$81	$623	$514	$722	$905	$1,298	$938	$1,491	$356	$944
2031	$107,418	$7,117,323	$2,066,507	$1,335,867	$2,320,153	$2,660,016	$1,874,795	$26,040,203	$1,871,190	$83	$638	$526	$740	$928	$1,330	$961	$1,551	$365	$975
2032	$110,104	$7,306,642	$2,117,632	$1,369,263	$2,378,157	$2,726,516	$1,921,664	$27,080,474	$1,917,970	$85	$654	$540	$758	$951	$1,363	$985	$1,613	$374	$1,008
2033	$112,856	$7,500,979	$2,170,297	$1,403,495	$2,437,611	$2,794,679	$1,969,706	$28,162,322	$1,965,920	$87	$671	$553	$777	$975	$1,397	$1,010	$1,677	$383	$1,042
2034	$115,678	$7,700,466	$2,224,549	$1,438,582	$2,498,551	$2,864,546	$2,018,949	$29,287,409	$2,015,068	$90	$688	$567	$797	$999	$1,432	$1,035	$1,744	$393	$1,077
2035	$118,570	$7,905,240	$2,280,440	$1,474,547	$2,561,015	$2,936,160	$2,069,422	$30,457,465	$2,065,444	$92	$705	$581	$817	$1,024	$1,468	$1,061	$1,814	$403	$1,113
2036	$121,534	$8,102,871	$2,338,022	$1,511,411	$2,625,040	$3,009,564	$2,121,158	$31,674,287	$2,117,080	$94	$722	$596	$837	$1,050	$1,505	$1,088	$1,886	$413	$1,150
2037	$124,572	$8,305,442	$2,397,348	$1,549,196	$2,690,666	$3,084,803	$2,174,187	$32,939,745	$2,170,007	$96	$740	$611	$858	$1,076	$1,542	$1,115	$1,962	$423	$1,189
2038	$127,687	$8,513,079	$2,458,474	$1,587,926	$2,757,933	$3,161,923	$2,228,542	$34,255,784	$2,224,257	$99	$759	$626	$879	$1,103	$1,581	$1,143	$2,040	$433	$1,230
2039	$130,879	$8,725,906	$2,521,459	$1,627,624	$2,826,881	$3,240,971	$2,284,255	$35,624,425	$2,279,864	$101	$778	$642	$901	$1,131	$1,620	$1,171	$2,122	$444	$1,271
2040	$134,151	$8,944,053	$2,586,361	$1,668,315	$2,897,553	$3,321,995	$2,341,361	$37,047,772	$2,336,861	$104	$797	$659	$924	$1,159	$1,661	$1,201	$2,206	$455	$1,315
2041	$137,504	$9,167,654	$2,653,243	$1,710,022	$2,969,992	$3,405,045	$2,399,896	$38,528,013	$2,395,282	$107	$817	$676	$947	$1,188	$1,703	$1,231	$2,294	$467	$1,359
2042	$140,942	$9,396,846	$2,722,168	$1,752,773	$3,044,242	$3,490,171	$2,459,893	$40,067,421	$2,455,164	$109	$838	$694	$971	$1,218	$1,745	$1,261	$2,386	$478	$1,406
2043	$144,466	$9,631,767	$2,793,203	$1,796,592	$3,120,348	$3,577,425	$2,521,390	$41,668,363	$2,516,543	$112	$859	$712	$995	$1,248	$1,789	$1,293	$2,481	$490	$1,454
2044	$148,077	$9,872,561	$2,866,414	$1,841,507	$3,198,357	$3,666,861	$2,584,425	$43,333,298	$2,579,457	$115	$880	$730	$1,020	$1,279	$1,833	$1,325	$2,581	$503	$1,504
2045	$151,779	$10,119,375	$2,941,874	$1,887,545	$3,278,316	$3,758,533	$2,649,036	$45,064,786	$2,643,943	$118	$902	$750	$1,045	$1,311	$1,879	$1,358	$2,684	$515	$1,555
2046	$155,574	$10,372,360	$3,019,654	$1,934,733	$3,360,274	$3,852,496	$2,715,261	$46,865,488	$2,710,042	$121	$925	$769	$1,071	$1,344	$1,926	$1,392	$2,791	$528	$1,609
2047	$159,463	$10,631,669	$3,099,830	$1,983,102	$3,444,281	$3,948,808	$2,783,143	$48,738,170	$2,777,793	$124	$948	$790	$1,098	$1,378	$1,974	$1,427	$2,902	$541	$1,664
2048	$163,450	$10,897,460	$3,182,481	$2,032,679	$3,530,388	$4,047,528	$2,852,722	$50,685,711	$2,847,238	$127	$971	$811	$1,126	$1,412	$2,024	$1,463	$3,018	$555	$1,721
2049	$167,536	$11,169,897	$3,267,686	$2,083,496	$3,618,647	$4,148,717	$2,924,040	$52,711,104	$2,918,419	$130	$996	$833	$1,154	$1,447	$2,074	$1,500	$3,139	$569	$1,781
2050	$171,724	$11,449,144	$3,355,529	$2,135,584	$3,709,113	$4,252,435	$2,997,141	$54,817,462	$2,991,379	$133	$1,021	$855	$1,183	$1,484	$2,126	$1,537	$3,264	$583	$1,842
2051	$176,017	$11,735,373	$3,446,097	$2,188,973	$3,801,841	$4,358,745	$3,072,069	$57,008,022	$3,066,164	$136	$1,046	$878	$1,212	$1,521	$2,179	$1,575	$3,395	$598	$1,906
2052	$180,418	$12,028,757	$3,539,478	$2,243,698	$3,896,887	$4,467,714	$3,148,871	$59,286,151	$3,142,818	$140	$1,072	$902	$1,242	$1,559	$2,234	$1,615	$3,531	$613	$1,972
2053	$184,928	$12,329,476	$3,635,765	$2,299,790	$3,994,309	$4,579,407	$3,227,593	$61,655,351	$3,221,388	$143	$1,099	$926	$1,273	$1,598	$2,290	$1,655	$3,672	$628	$2,041
2054	$189,551	$12,637,713	$3,735,054	$2,357,285	$4,094,167	$4,693,892	$3,308,282	$64,119,262	$3,301,923	$147	$1,127	$952	$1,305	$1,638	$2,347	$1,697	$3,818	$644	$2,112
2055	$194,290	$12,953,656	$3,837,443	$2,416,217	$4,196,521	$4,811,239	$3,390,990	$66,681,672	$3,384,471	$150	$1,155	$978	$1,338	$1,679	$2,406	$1,739	$3,971	$660	$2,185
2056	$199,148	$13,277,497	$3,943,035	$2,476,622	$4,301,434	$4,931,520	$3,475,764	$69,346,520	$3,469,083	$154	$1,184	$1,005	$1,371	$1,721	$2,466	$1,782	$4,130	$676	$2,262
2057	$204,126	$13,609,435	$4,051,935	$2,538,538	$4,408,970	$5,054,808	$3,562,658	$72,117,900	$3,555,810	$158	$1,213	$1,032	$1,406	$1,764	$2,527	$1,827	$4,295	$693	$2,341
2058	$209,229	$13,949,670	$4,164,252	$2,602,001	$4,519,195	$5,181,179	$3,651,725	$75,000,075	$3,644,705	$162	$1,244	$1,061	$1,441	$1,808	$2,591	$1,873	$4,466	$710	$2,423
2059	$214,460	$14,298,412	$4,280,101	$2,667,051	$4,632,174	$5,310,708	$3,743,018	$77,997,472	$3,735,822	$166	$1,275	$1,090	$1,477	$1,853	$2,655	$1,919	$4,645	$728	$2,507
2060	$219,822	$14,655,873	$4,399,597	$2,733,728	$4,747,979	$5,443,476	$3,836,593	$81,114,700	$3,829,218	$170	$1,306	$1,121	$1,514	$1,899	$2,722	$1,967	$4,831	$746	$2,595
2061	$225,317	$15,022,269	$4,522,863	$2,802,071	$4,866,678	$5,579,563	$3,932,508	$84,356,551	$3,924,949	$175	$1,339	$1,152	$1,552	$1,947	$2,790	$2,017	$5,024	$765	$2,687
2062	$230,950	$15,397,826	$4,650,025	$2,872,123	$4,988,345	$5,719,052	$4,030,821	$87,728,007	$4,023,072	$179	$1,373	$1,185	$1,590	$1,995	$2,860	$2,067	$5,224	$784	$2,781
2063	$236,724	$15,782,772	$4,781,211	$2,943,926	$5,113,054	$5,862,028	$4,131,591	$91,234,252	$4,123,649	$183	$1,407	$1,218	$1,630	$2,045	$2,931	$2,119	$5,433	$804	$2,879
2064	$242,642	$16,177,341	$4,916,556	$3,017,524	$5,240,880	$6,008,579	$4,234,881	$94,880,674	$4,226,740	$188	$1,442	$1,253	$1,671	$2,096	$3,004	$2,172	$5,650	$824	$2,981
2065	$248,708	$16,581,775	$5,056,200	$3,092,962	$5,371,902	$6,158,793	$4,340,753	$98,672,880	$4,332,409	$193	$1,478	$1,288	$1,713	$2,149	$3,079	$2,226	$5,876	$844	$3,086
2066	$254,926	$16,996,319	$5,200,286	$3,170,286	$5,506,200	$6,312,763	$4,449,272	$102,616,698	$4,440,719	$197	$1,515	$1,325	$1,756	$2,202	$3,156	$2,282	$6,111	$865	$3,195
2067	$261,299	$17,421,227	$5,348,964	$3,249,543	$5,643,855	$6,470,582	$4,560,504	$106,718,191	$4,551,737	$202	$1,553	$1,363	$1,799	$2,258	$3,235	$2,339	$6,355	$887	$3,309
2068	$267,831	$17,856,758	$5,502,388	$3,330,782	$5,784,951	$6,632,347	$4,674,517	$110,983,665	$4,665,530	$207	$1,592	$1,402	$1,844	$2,314	$3,316	$2,397	$6,609	$909	$3,426
2069	$274,527	$18,303,176	$5,660,719	$3,414,051	$5,929,575	$6,798,155	$4,791,379	$115,419,677	$4,782,169	$213	$1,632	$1,442	$1,890	$2,372	$3,399	$2,457	$6,873	$932	$3,548
2070	$281,390	$18,760,756	$5,824,120	$3,499,403	$6,077,814	$6,968,109	$4,911,164	$120,033,045	$4,901,723	$218	$1,672	$1,484	$1,938	$2,431	$3,484	$2,519	$7,148	$955	$3,674
2071	$288,425	$19,229,775	$5,992,764	$3,586,888	$6,229,760	$7,142,312	$5,033,943	$124,830,863	$5,024,266	$223	$1,714	$1,527	$1,986	$2,492	$3,571	$2,582	$7,434	$979	$3,805
2072	$295,636	$19,710,519	$6,166,828	$3,676,560	$6,385,504	$7,320,870	$5,159,792	$129,820,506	$5,149,873	$229	$1,757	$1,571	$2,036	$2,554	$3,660	$2,646	$7,731	$1,004	$3,941

Appendix C

Cost Model for the Basin Optimization Scenarios 1, 2, and 3

Table C-1. Planning Criteria -- Unit Costs and Other Assumptions		
Item	**Cost/Unit**	**Unit**
Site Work		
Site Preparation- Temporary Construction Fencing, Tree Protection, and Traffic Control	$17,188	$/acre
Trenching, Shoring, and Bracing	$12,500	$/acre
Earthwork- Rough Grading, Fine Grading, Imported Soil	$103,750	$/acre
Selective Demolition, Clearing and Grubbing, Tree Removal and Trimming	$20,500	$/acre
Loam and Seed	$10	$/SF
Miscellaneous Signage and Striping	$15,188	$/acre
Equipment		
Wells	$2,000,000	$/Well
6" Pipeline	$167	$/LF
8" Pipeline	$182	$/LF
RO Treatment Plant and Wasteline	$10,212,403	MGD
Connections	$7,500	EA
Underground Recharge Vault - Scenario 2	$9,300,000	LS
Underground Recharge Vault - Scenario 3	$21,000,000	LS
Other		
Pipelines - general	$1	$/feet
Misc. well maintenance	$35,292	$/year/well
Treatment Plant	$2,143	$/af
Underground Recharge Vault	$2,500	$/year
Estimating Contigency	30%	
Construction Contigency	10%	
Engineering and Admin	10%	
Construction Management	10%	
Amortization Rate	5%	
Amortization Period	30	Years

Notes:

All costs are for 2021. An inflation rate of 2.5% was assumed to estimated unit cost for supplies for the aggregate water supply for the Spadra Basin

SF - Squared foot

LF - Linear feet

MGD - Million gallons per day

EA - Each

LS - Lump Sum

Table C-2a. Engineering Cost Estimates -- Basin Optimization Scenario 1					
	Description	Quantity	Unit	Unit Cost	Total Cost
Construction Work					
Site Work					
	N/A				
Pipelines and Facilities					
	Recycled Water Pipelines				
	CPP-2 to Existing RW Pipeline	1910	LF	$ 167	$ 318,970
	CPP-3 to Existing RW Pipeline	710	LF	$ 167	$ 118,570
	CPP-4 to Existing RW Pipeline	990	LF	$ 167	$ 165,330
	Recycled Water Connections	3	EA	$ 7,500	$ 22,500
	Subtotal 1				$ 625,370
Contingencies, Other Project Costs, and Total					
	Estimating Contigency		30%		$ 187,611
	Subtotal 2				$ 812,981
	Construction Contigency		10%		$ 81,298
	Subtotal 3				$ 894,279
	Other Project Costs				
	Engineering and Admin		10%		$ 89,428
	Construction Management		10%		$ 89,428
	Total				**$ 1,073,135**
Operations and Maintenance (Annual)					
	Pipelines - general	3610	LF	$ 1.07	$ 3,878
	Total				**$ 3,878**
Annualized Costs					
	Annualized Capital Cost (30 years at 5.0 percent)				$ 69,809
	Operations and Maintenance				$ 3,878
	Total (Capital + O&M)				**$ 73,687**

Table C-2b. Engineering Cost Estimates -- Basin Optimization Scenario 2					
	Description	Quantity	Unit	Unit Cost	Total Cost
Construction Work					
Site Work					
	Site Preparation- Temporary Construction Fencing, Tree Protection, and Traffic Control	1.50	acre	$ 17,188	$ 25,781
	Trenching, Shoring, and Bracing	1.50	acre	$ 12,500	$ 18,750
	Earthwork- Rough Grading, Fine Grading, Imported Soil	1.50	acre	$ 103,750	$ 155,625
	Selective Demolition, Clearing and Grubbing, Tree Removal and Trimming	1.50	acre	$ 20,500	$ 30,750
	Loam and Seed/Baseball Field	65340	SF	$ 10	$ 653,400
	Miscellaneous Signage and Striping	1.50	acre	$ 15,188	$ 22,781
Pipelines and Facilities					
	Underground Recharge Gallery	1	LS	$9,300,000	$ 9,300,000
	Underground Recharge Gallery to RW pipelines	4200	LF	$ 167	$ 701,400
	Underground Recharge Connections	1	EA	$ 7,500	$ 7,500
	Injection Well	1	EA	$ 2,000,000	$ 2,000,000
	Injection Well Piping	540	LF	$ 167	$ 90,180
	Subtotal 1				**$ 13,006,168**
Contingencies, Other Project Costs, and Total					
	Estimating Contigency		30%		$ 3,901,850
	Subtotal 2				$ 16,908,018
	Construction Contigency		10%		$ 1,690,802
	Subtotal 3				$ 18,598,820
	Other Project Costs				
	Engineering and Admin		10%		$ 1,859,882
	Construction Management		10%		$ 1,859,882
	Total				**$ 22,318,583**
Operations and Maintenance (Annual)					
	Pipelines - general	4740	LF	$ 1.07	$ 5,092
	Misc. well maintenance	1	year/well	$ 35,292	$ 35,292
	Underground Recharge Gallery Cleaning	1	$/year	$ 2,500.00	$ 2,500
	Total				**$ 42,884**
Annualized Costs					
	Annualized Capital Cost (30 years at 5.0 percent)				$ 1,451,856
	Operations and Maintenance				$ 42,884
	Total (Capital + O&M)				**$ 1,494,740**

Table C-2c. Engineering Cost Estimates -- Basin Optimization Scenario 3					
	Description	Quantity	Unit	Unit Cost	Total Cost
Construction Work					
Site Work					
	Site Preparation- Temporary Construction Fencing, Tree Protection, and Traffic Control	4.20	acre	$ 17,188	$ 72,188
	Trenching, Shoring, and Bracing	4.20	acre	$ 12,500	$ 52,500
	Earthwork- Rough Grading, Fine Grading, Imported Soil	4.20	acre	$ 103,750	$ 435,750
	Selective Demolition, Clearing and Grubbing, Tree Removal and Trimming	4.20	acre	$ 20,500	$ 86,100
	Loam and Seed/Baseball Field	182952	SF	$ 10	$ 1,829,520
	Miscellaneous Signage and Striping	4.20	acre	$ 15,188	$ 63,788
Pipelines and Facilities					
	Underground Recharge Gallery	1	LS	$21,000,000	$ 21,000,000
	Underground Recharge Gallery to RW Pipelines	1,300	LF	$ 167	$ 217,100
	Recycled Water Connections	15	EA	$ 7,500	$ 112,500
	Injection Wells	7	EA	$ 2,000,000	$ 14,000,000
	Injection Wells Piping - 8"	9,500	LF	$ 182	$ 1,729,000
	Production Wells	5	EA	$ 2,000,000	$ 10,000,000
	Production Wells Piping - 6"	24,000	LF	$ 167	$ 4,008,000
	RO Plant and Wasteline	3.8	MGD	$ 10,212,403	$ 38,938,901
	Pipelines from RO Plant	6,000	LF	$ 167	$ 1,002,000
	Subtotal				$ 93,547,346
Contingencies, Other Project Costs, and Total					
	Estimating Contigency		30%		$ 28,064,204
	Subtotal 2				$ 121,611,550
	Construction Contigency		10%		$ 12,161,155
	Subtotal 3				$ 133,772,705
	Other Project Costs				
	Engineering and Admin		10%		$ 13,377,271
	Construction Management		10%		$ 13,377,271
	Total				**$ 160,527,246**
Operations and Maintenance (Annual)					
	Pipelines - general	40,800	LF	$ 1.07	$ 43,829
	Misc. well maintenance	12	year/well	$ 35,292	$ 423,507
	Underground Recharge Gallery Cleaning	1	$/year	$ 2,500	$ 2,500
	RO Plant	1	LS	$ 2,143	$ 2,143
	Total				**$ 471,979**
Annualized Costs					
	Annualized Capital Cost (30 years at 5.0 percent)				$ 10,442,528
	Operations and Maintenance				$ 471,979
	Total (Capital + O&M)				**$ 10,914,506**

Table C-3a. Total Water Supplies -- Aggregate of All Agencies for Basin Optimization Scenario 1

Year	Puente Basin	Chino Basin	Six Basins	Spadra Basin	Main San Gabriel Basin	Central Basin	San Antonio Creek Water	Imported Water	Recycled Water	Total
2021	1,345	11,416	3,300	945	0	0	1,950	22,011	5,424	46,392
2022	1,332	11,323	3,925	1,190	0	0	1,950	21,371	5,389	46,480
2023	1,318	11,231	3,925	1,434	0	0	1,950	21,356	5,355	46,568
2024	1,305	11,138	3,925	1,678	0	0	1,950	21,341	5,320	46,657
2025	1,291	11,045	3,925	1,922	2,500	2,000	1,950	16,826	5,286	46,745
2026	1,291	11,062	3,925	1,899	2,500	2,000	1,950	16,819	5,255	46,701
2027	1,291	11,079	3,925	1,432	2,500	2,000	1,950	16,812	5,667	46,657
2028	1,291	11,097	3,925	1,401	2,500	2,000	1,950	16,806	5,644	46,613
2029	1,291	11,114	3,925	1,391	2,500	2,000	1,950	16,799	5,600	46,570
2030	1,291	11,131	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,526
2031	1,291	11,148	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,543
2032	1,291	11,166	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,561
2033	1,291	11,183	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,578
2034	1,291	11,201	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,596
2035	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2036	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2037	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2038	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2039	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2040	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2041	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2042	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2043	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2044	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2045	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2046	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2047	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2048	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2049	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2050	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2051	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2052	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2053	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2054	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2055	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2056	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2057	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2058	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2059	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2060	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2061	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2062	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2063	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2064	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2065	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2066	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2067	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2068	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2069	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2070	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2071	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613
2072	1,291	11,218	3,925	1,376	2,500	2,000	1,950	16,792	5,561	46,613

Table C-3b. Total Water Supplies -- Aggregate of All Agencies for Basin Optimization Scenario 2

Year	Puente Basin	Chino Basin	Six Basins	Spadra Basin	Main San Gabriel Basin	Central Basin	San Antonio Creek Water	Imported Water	Recycled Water	Total
2021	1,345	11,416	3,300	945	0	0	1,950	22,011	5,424	46,392
2022	1,332	11,323	3,925	1,190	0	0	1,950	21,371	5,389	46,480
2023	1,318	11,231	3,925	1,434	0	0	1,950	21,356	5,355	46,568
2024	1,305	11,138	3,925	1,678	0	0	1,950	21,341	5,320	46,657
2025	1,291	11,045	3,925	1,922	2,500	2,000	1,950	16,826	5,286	46,745
2026	1,291	11,062	3,925	1,899	2,500	2,000	1,950	16,819	5,255	46,701
2027	1,291	11,079	3,925	1,875	2,500	2,000	1,950	16,812	5,224	46,657
2028	1,291	11,097	3,925	1,852	2,500	2,000	1,950	16,806	5,193	46,613
2029	1,291	11,114	3,925	1,829	2,500	2,000	1,950	16,799	5,162	46,570
2030	1,291	11,131	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,526
2031	1,291	11,148	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,543
2032	1,291	11,166	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,561
2033	1,291	11,183	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,578
2034	1,291	11,201	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,596
2035	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2036	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2037	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2038	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2039	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2040	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2041	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2042	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2043	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2044	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2045	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2046	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2047	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2048	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2049	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2050	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2051	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2052	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2053	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2054	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2055	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2056	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2057	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2058	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2059	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2060	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2061	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2062	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2063	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2064	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2065	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2066	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2067	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2068	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2069	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2070	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2071	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613
2071	1,291	11,218	3,925	1,806	2,500	2,000	1,950	16,792	5,131	46,613

Table C-3c. Total Water Supplies -- Aggregate of All Agencies for Basin Optimization Scenario 3

Year	Puente Basin	Chino Basin	Six Basins	Spadra Basin	Main San Gabriel Basin	Central Basin	San Antonio Creek Water	Imported Water	Recycled Water	New Spadra Supply Scenario 3	Total
2021	1,345	11,416	3,300	945	0	0	1,950	22,011	5,424	0	46,392
2022	1,332	11,323	3,925	1,190	0	0	1,950	21,371	5,389	0	46,480
2023	1,318	11,231	3,925	1,434	0	0	1,950	21,356	5,355	0	46,568
2024	1,305	11,138	3,925	1,678	0	0	1,950	21,341	5,320	0	46,657
2025	1,291	11,045	3,925	1,922	2,500	2,000	1,950	16,826	5,286	0	46,745
2026	1,291	11,062	3,925	1,899	2,500	2,000	1,950	16,819	5,255	0	46,701
2027	1,291	11,079	3,925	1,875	2,500	2,000	1,950	16,812	5,224	0	46,657
2028	1,291	11,097	3,925	1,852	2,500	2,000	1,950	16,806	5,193	0	46,613
2029	1,291	11,114	3,925	1,829	2,500	2,000	1,950	16,799	5,162	0	46,570
2030	1,291	11,131	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,526
2031	1,291	11,148	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,543
2032	1,291	11,166	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,561
2033	1,291	11,183	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,578
2034	1,291	11,201	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,596
2035	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2036	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2037	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2038	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2039	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2040	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2041	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2042	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2043	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2044	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2045	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2046	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2047	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2048	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2049	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2050	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2051	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2052	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2053	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2054	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2055	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2056	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2057	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2058	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2059	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2060	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2061	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2062	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2063	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2064	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2065	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2066	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2067	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2068	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2069	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2070	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2071	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613
2072	1,291	11,218	3,925	1,806	2,500	2,000	1,950	13,792	5,131	3,000	46,613

Table C-4a. Melded Costs for Water Supplies -- Aggregate of All Agencies for Basin Optimization Scenario 1

	Total Annual Cost									Capital Costs - Scenario 1			Unit Cost								
Year	Puente Basin	Chino Basin	Six Basins	Spadra Basin	Main San Gabriel Basin	Central Basin	San Antonio Creek Water	Imported Water	Recycled Water	Construction	O&M	Total	Puente Basin	Chino Basin	Six Basins	Spadra Basin	Main San Gabriel Basin	Central Basin	San Antonio Creek Water	Imported Water	Recycled Water	Melded Total
2021	$87,451	$5,693,601	$1,079,140	$647,388	$0	$0	$1,464,587	$24,390,117	$1,481,785	$0	$0	$0	$65	$499	$327	$685			$751	$1,108	$273	$751
2022	$88,731	$5,788,502	$1,684,388	$724,477	$0	$0	$1,501,201	$24,516,515	$1,520,531	$0	$0	$0	$67	$511	$429	$609			$770	$1,147	$282	$771
2023	$90,021	$5,884,590	$1,727,435	$805,015	$0	$0	$1,538,731	$25,718,039	$1,560,288	$0	$0	$0	$68	$524	$440	$562			$789	$1,204	$291	$801
2024	$91,319	$5,981,864	$1,772,002	$970,666	$0	$0	$1,577,199	$26,981,886	$1,601,083	$0	$0	$0	$70	$537	$451	$579			$809	$1,264	$301	$835
2025	$92,626	$6,080,323	$1,814,729	$1,126,535	$2,000,661	$2,293,723	$1,616,629	$22,137,604	$1,642,943	$0	$0	$0	$72	$551	$462	$586	$800	$1,147	$829	$1,316	$311	$830
2026	$94,942	$6,242,037	$1,850,854	$1,145,165	$2,050,677	$2,351,066	$1,657,045	$22,550,763	$1,677,985	$0	$0	$0	$74	$564	$472	$603	$820	$1,176	$850	$1,341	$319	$848
2027	$97,316	$6,408,036	$1,890,237	$1,136,472	$2,101,944	$2,409,843	$1,698,471	$23,114,925	$1,802,171	$80,957	$4,497	$85,454	$75	$578	$482	$794	$841	$1,205	$871	$1,375	$318	$873
2028	$99,749	$6,578,433	$1,930,085	$1,154,369	$2,154,493	$2,470,089	$1,740,933	$23,661,850	$1,842,492	$80,957	$4,610	$85,567	$77	$593	$492	$824	$862	$1,235	$893	$1,408	$326	$895
2029	$102,242	$6,753,346	$1,972,384	$1,218,191	$2,208,355	$2,531,841	$1,784,456	$24,309,150	$1,879,365	$80,957	$4,725	$85,682	$79	$608	$503	$876	$883	$1,266	$915	$1,447	$336	$920
2030	$104,798	$6,932,892	$2,016,873	$1,274,517	$2,263,564	$2,595,137	$1,829,068	$25,039,912	$1,917,875	$80,957	$4,843	$85,800	$81	$623	$514	$926	$905	$1,298	$938	$1,491	$345	$947
2031	$107,418	$7,117,323	$2,066,507	$1,306,380	$2,320,153	$2,660,016	$1,874,795	$26,040,203	$1,965,822	$80,957	$4,964	$85,921	$83	$638	$526	$949	$928	$1,330	$961	$1,551	$354	$979
2032	$110,104	$7,306,642	$2,117,632	$1,339,040	$2,378,157	$2,726,516	$1,921,664	$27,080,474	$2,014,967	$80,957	$5,088	$86,045	$85	$654	$540	$973	$951	$1,363	$985	$1,613	$362	$1,011
2033	$112,856	$7,500,979	$2,170,297	$1,372,516	$2,437,611	$2,794,679	$1,969,706	$28,162,322	$2,065,341	$80,957	$5,215	$86,172	$87	$671	$553	$997	$975	$1,397	$1,010	$1,677	$371	$1,045
2034	$115,678	$7,700,466	$2,224,549	$1,406,829	$2,498,551	$2,864,546	$2,018,949	$29,287,409	$2,116,975	$80,957	$5,346	$86,303	$90	$688	$567	$1,022	$999	$1,432	$1,035	$1,744	$381	$1,080
2035	$118,570	$7,905,240	$2,280,440	$1,441,999	$2,561,015	$2,936,160	$2,069,422	$30,457,465	$2,169,899	$80,957	$5,480	$86,437	$92	$705	$581	$1,048	$1,024	$1,468	$1,061	$1,814	$390	$1,116
2036	$121,534	$8,102,871	$2,338,022	$1,478,049	$2,625,040	$3,009,564	$2,121,158	$31,674,287	$2,224,147	$80,957	$5,616	$86,573	$94	$722	$596	$1,074	$1,050	$1,505	$1,088	$1,886	$400	$1,154
2037	$124,572	$8,305,442	$2,397,348	$1,515,001	$2,690,666	$3,084,803	$2,174,187	$32,939,745	$2,279,750	$80,957	$5,757	$86,714	$96	$740	$611	$1,101	$1,076	$1,542	$1,115	$1,962	$410	$1,193
2038	$127,687	$8,513,079	$2,458,474	$1,552,876	$2,757,933	$3,161,923	$2,228,542	$34,255,784	$2,336,744	$80,957	$5,901	$86,858	$99	$759	$626	$1,129	$1,103	$1,581	$1,143	$2,040	$420	$1,233
2039	$130,879	$8,725,906	$2,521,459	$1,591,697	$2,826,881	$3,240,971	$2,284,255	$35,624,425	$2,395,163	$80,957	$6,048	$87,005	$101	$778	$642	$1,157	$1,131	$1,620	$1,171	$2,122	$431	$1,275
2040	$134,151	$8,944,053	$2,586,361	$1,631,490	$2,897,553	$3,321,995	$2,341,361	$37,047,772	$2,455,042	$80,957	$6,200	$87,157	$104	$797	$659	$1,186	$1,159	$1,661	$1,201	$2,206	$441	$1,318
2041	$137,504	$9,167,654	$2,653,243	$1,672,277	$2,969,992	$3,405,045	$2,399,896	$38,528,013	$2,516,418	$80,957	$6,355	$87,312	$107	$817	$676	$1,215	$1,188	$1,703	$1,231	$2,294	$453	$1,363
2042	$140,942	$9,396,846	$2,722,168	$1,714,084	$3,044,242	$3,490,171	$2,459,893	$40,067,421	$2,579,328	$80,957	$6,513	$87,470	$109	$838	$694	$1,246	$1,218	$1,745	$1,261	$2,386	$464	$1,410
2043	$144,466	$9,631,767	$2,793,203	$1,756,936	$3,120,348	$3,577,425	$2,521,390	$41,668,363	$2,643,811	$80,957	$6,676	$87,633	$112	$859	$712	$1,277	$1,248	$1,789	$1,293	$2,481	$475	$1,458
2044	$148,077	$9,872,561	$2,866,414	$1,800,860	$3,198,357	$3,666,861	$2,584,425	$43,333,298	$2,709,907	$80,957	$6,843	$87,800	$115	$880	$730	$1,309	$1,279	$1,833	$1,325	$2,581	$487	$1,507
2045	$151,779	$10,119,375	$2,941,874	$1,845,881	$3,278,316	$3,758,533	$2,649,036	$45,064,786	$2,777,654	$80,957	$7,014	$87,971	$118	$902	$750	$1,341	$1,311	$1,879	$1,358	$2,684	$499	$1,559
2046	$155,574	$10,372,360	$3,019,654	$1,892,028	$3,360,274	$3,852,496	$2,715,261	$46,865,488	$2,847,096	$80,957	$7,190	$88,147	$121	$925	$769	$1,375	$1,344	$1,926	$1,392	$2,791	$512	$1,613
2047	$159,463	$10,631,669	$3,099,830	$1,939,329	$3,444,281	$3,948,808	$2,783,143	$48,738,170	$2,918,273	$80,957	$7,369	$88,326	$124	$948	$790	$1,409	$1,378	$1,974	$1,427	$2,902	$525	$1,668
2048	$163,450	$10,897,460	$3,182,481	$1,987,812	$3,530,388	$4,047,528	$2,852,722	$50,685,711	$2,991,230	$80,957	$7,554	$88,511	$127	$971	$811	$1,445	$1,412	$2,024	$1,463	$3,018	$538	$1,725
2049	$167,536	$11,169,897	$3,267,686	$2,037,507	$3,618,647	$4,148,717	$2,924,040	$52,711,104	$3,066,011	$80,957	$7,742	$88,699	$130	$996	$833	$1,481	$1,447	$2,074	$1,500	$3,139	$551	$1,785
2050	$171,724	$11,449,144	$3,355,529	$2,088,445	$3,709,113	$4,252,435	$2,997,141	$54,817,462	$3,142,661	$80,957	$7,936	$88,893	$133	$1,021	$855	$1,518	$1,484	$2,126	$1,537	$3,264	$565	$1,847
2051	$176,017	$11,735,373	$3,446,097	$2,140,656	$3,801,841	$4,358,745	$3,072,069	$57,008,022	$3,221,227	$80,957	$8,134	$89,091	$136	$1,046	$878	$1,556	$1,521	$2,179	$1,575	$3,395	$579	$1,910
2052	$180,418	$12,028,757	$3,539,478	$2,194,173	$3,896,887	$4,467,714	$3,148,871	$59,286,151	$3,301,758	$80,957	$8,338	$89,295	$140	$1,072	$902	$1,595	$1,559	$2,234	$1,615	$3,531	$594	$1,977
2053	$184,928	$12,329,476	$3,635,765	$2,249,027	$3,994,309	$4,579,407	$3,227,593	$61,655,351	$3,384,302	$80,957	$8,546	$89,503	$143	$1,099	$926	$1,634	$1,598	$2,290	$1,655	$3,672	$609	$2,045
2054	$189,551	$12,637,713	$3,735,054	$2,305,252	$4,094,167	$4,693,892	$3,308,282	$64,119,262	$3,468,910	$80,957	$8,760	$89,717	$147	$1,127	$952	$1,675	$1,638	$2,347	$1,697	$3,818	$624	$2,116
2055	$194,290	$12,953,656	$3,837,443	$2,362,884	$4,196,521	$4,811,239	$3,390,990	$66,681,672	$3,555,632	$80,957	$8,979	$89,936	$150	$1,155	$978	$1,717	$1,679	$2,406	$1,739	$3,971	$639	$2,190
2056	$199,148	$13,277,497	$3,943,035	$2,421,956	$4,301,434	$4,931,520	$3,475,764	$69,346,520	$3,644,523	$80,957	$9,203	$90,160	$154	$1,184	$1,005	$1,760	$1,721	$2,466	$1,782	$4,130	$655	$2,266
2057	$204,126	$13,609,435	$4,051,935	$2,482,505	$4,408,970	$5,054,808	$3,562,658	$72,117,900	$3,735,636	$0	$9,433	$9,433	$158	$1,213	$1,032	$1,804	$1,764	$2,527	$1,827	$4,295	$672	$2,344
2058	$209,229	$13,949,670	$4,164,252	$2,544,567	$4,519,195	$5,181,179	$3,651,725	$75,000,075	$3,829,027	$0	$9,669	$9,669	$162	$1,244	$1,061	$1,849	$1,808	$2,591	$1,873	$4,466	$689	$2,425
2059	$214,460	$14,298,412	$4,280,101	$2,608,182	$4,632,174	$5,310,708	$3,743,018	$77,997,472	$3,924,753	$0	$9,911	$9,911	$166	$1,275	$1,090	$1,895	$1,853	$2,655	$1,919	$4,645	$706	$2,510
2060	$219,822	$14,655,873	$4,399,597	$2,673,386	$4,747,979	$5,443,476	$3,836,593	$81,114,700	$4,022,872	$0	$10,159	$10,159	$170	$1,306	$1,121	$1,943	$1,899	$2,722	$1,967	$4,831	$723	$2,599
2061	$225,317	$15,022,269	$4,522,863	$2,740,221	$4,866,678	$5,579,563	$3,932,508	$84,356,551	$4,123,443	$0	$10,413	$10,413	$175	$1,339	$1,152	$1,991	$1,947	$2,790	$2,017	$5,024	$742	$2,690
2062	$230,950	$15,397,826	$4,650,025	$2,808,726	$4,988,345	$5,719,052	$4,030,821	$87,728,007	$4,226,530	$0	$10,673	$10,673	$179	$1,373	$1,185	$2,041	$1,995	$2,860	$2,067	$5,224	$760	$2,784
2063	$236,724	$15,782,772	$4,781,211	$2,878,944	$5,113,054	$5,862,028	$4,131,591	$91,234,252	$4,332,193	$0	$10,940	$10,940	$183	$1,407	$1,218	$2,092	$2,045	$2,931	$2,119	$5,433	$779	$2,883
2064	$242,642	$16,177,341	$4,916,556	$2,950,918	$5,240,880	$6,008,579	$4,234,881	$94,880,674	$4,440,498	$0	$11,213	$11,213	$188	$1,442	$1,253	$2,145	$2,096	$3,004	$2,172	$5,650	$799	$2,984
2065	$248,708	$16,581,775	$5,056,200	$3,024,691	$5,371,902	$6,158,793	$4,340,753	$98,672,880	$4,551,510	$0	$11,494	$11,494	$193	$1,478	$1,288	$2,198	$2,149	$3,079	$2,226	$5,876	$818	$3,090
2066	$254,926	$16,996,319	$5,200,286	$3,100,308	$5,506,200	$6,312,763	$4,449,272	$102,616,698	$4,665,298	$0	$11,781	$11,781	$197	$1,515	$1,325	$2,253	$2,202	$3,156	$2,282	$6,111	$839	$3,199
2067	$261,299	$17,421,227	$5,348,964	$3,177,816	$5,643,855	$6,470,582	$4,560,504	$106,718,191	$4,781,930	$0	$12,075	$12,075	$202	$1,553	$1,363	$2,309	$2,258	$3,235	$2,339	$6,355	$860	$3,312
2068	$267,831	$17,856,758	$5,502,388	$3,257,261	$5,784,951	$6,632,347	$4,674,517	$110,983,665	$4,901,479	$0	$12,377	$12,377	$207	$1,592	$1,402	$2,367	$2,314	$3,316	$2,397	$6,609	$881	$3,430
2069	$274,527	$18,303,176	$5,660,719	$3,338,693	$5,929,575	$6,798,155	$4,791,379	$115,419,677	$5,024,015	$0	$12,687	$12,687	$213	$1,632	$1,442	$2,426	$2,372	$3,399	$2,457	$6,873	$903	$3,552
2070	$281,390	$18,760,756	$5,824,120	$3,422,160	$6,077,814	$6,968,109	$4,911,164	$120,033,045	$5,149,616	$0	$13,004	$13,004	$218	$1,672	$1,484	$2,487	$2,431	$3,484	$2,519	$7,148	$926	$3,678
2071	$288,425	$19,229,775	$5,992,764	$3,507,714	$6,229,760	$7,142,312	$5,033,943	$124,830,863	$5,278,356	$0	$13,329	$13,329	$223	$1,714	$1,527	$2,549	$2,492	$3,571	$2,582	$7,434	$949	$3,809
2072	$295,636	$19,710,519	$6,166,828	$3,595,407	$6,385,504	$7,320,870	$5,159,792	$129,820,506	$5,410,315	$0	$13,662	$13,662	$229	$1,757	$1,571	$2,613	$2,554	$3,660	$2,646	$7,731	$973	$3,945

Table C-4b. Melded Costs for Water Supplies -- Aggregate of All Agencies for Basin Optimization Scenario 2

	Total Annual Cost									Capital Costs - Scenario 2				Unit Cost								
Year	Puente Basin	Chino Basin	Six Basins	Spadra Basin	Main San Gabriel Basin	Central Basin	San Antonio Creek Water	Imported Water	Recycled Water	Construction	O&M	Recycled Water	Total	Puente Basin	Chino Basin	Six Basins	Spadra Basin	Main San Gabriel Basin	Central Basin	San Antonio Creek Water	Imported Water	Recycled Water	Melded Total
2021	$87,451	$5,693,601	$1,079,140	$647,388	$0	$0	$1,464,587	$24,390,117	$1,481,785	$0	$0	$0	$0	$65	$499	$327	$685			$751	$1,108	$273	$751
2022	$88,731	$5,788,502	$1,684,388	$724,477	$0	$0	$1,501,201	$24,516,515	$1,520,531	$0	$0	$0	$0	$67	$511	$429	$609			$770	$1,147	$282	$771
2023	$90,021	$5,884,590	$1,727,435	$805,015	$0	$0	$1,538,731	$25,718,039	$1,560,288	$0	$0	$0	$0	$68	$524	$440	$562			$789	$1,204	$291	$801
2024	$91,319	$5,981,864	$1,772,002	$970,666	$0	$0	$1,577,199	$26,981,886	$1,601,083	$0	$0	$0	$0	$70	$537	$451	$579			$809	$1,264	$301	$835
2025	$92,626	$6,080,323	$1,814,729	$1,126,535	$2,000,661	$2,293,723	$1,616,629	$22,137,604	$1,642,943	$0	$0	$0	$0	$72	$551	$462	$586	$800	$1,147	$829	$1,316	$311	$830
2026	$94,942	$6,242,037	$1,850,854	$1,145,165	$2,050,677	$2,351,066	$1,657,045	$22,550,763	$1,677,985	$0	$0	$0	$0	$74	$564	$472	$603	$820	$1,176	$850	$1,341	$319	$848
2027	$97,316	$6,408,036	$1,890,237	$1,164,023	$2,101,944	$2,409,843	$1,698,471	$23,114,925	$1,813,463	$1,683,708	$49,732	$0	$1,733,440	$75	$578	$482	$621	$841	$1,205	$871	$1,375	$347	$909
2028	$99,749	$6,578,433	$1,930,085	$1,183,108	$2,154,493	$2,470,089	$1,740,933	$23,661,850	$1,852,463	$1,683,708	$50,976	$0	$1,734,683	$77	$593	$492	$639	$862	$1,235	$893	$1,408	$357	$931
2029	$102,242	$6,753,346	$1,972,384	$1,246,809	$2,208,355	$2,531,841	$1,784,456	$24,309,150	$1,892,279	$1,683,708	$52,250	$0	$1,735,958	$79	$608	$503	$682	$883	$1,266	$915	$1,447	$367	$956
2030	$104,798	$6,932,892	$2,016,873	$1,303,285	$2,263,564	$2,595,137	$1,829,068	$25,039,912	$1,932,929	$1,683,708	$53,556	$0	$1,737,264	$81	$623	$514	$722	$905	$1,298	$938	$1,491	$377	$983
2031	$107,418	$7,117,323	$2,066,507	$1,335,867	$2,320,153	$2,660,016	$1,874,795	$26,040,203	$1,981,252	$1,683,708	$54,895	$0	$1,738,603	$83	$638	$526	$740	$928	$1,330	$961	$1,551	$386	$1,015
2032	$110,104	$7,306,642	$2,117,632	$1,369,263	$2,378,157	$2,726,516	$1,921,664	$27,080,474	$2,030,783	$1,683,708	$56,268	$0	$1,739,975	$85	$654	$540	$758	$951	$1,363	$985	$1,613	$396	$1,048
2033	$112,856	$7,500,979	$2,170,297	$1,403,495	$2,437,611	$2,794,679	$1,969,706	$28,162,322	$2,081,553	$1,683,708	$57,674	$0	$1,741,382	$87	$671	$553	$777	$975	$1,397	$1,010	$1,677	$406	$1,082
2034	$115,678	$7,700,466	$2,224,549	$1,438,582	$2,498,551	$2,864,546	$2,018,949	$29,287,409	$2,133,592	$1,683,708	$59,116	$0	$1,742,824	$90	$688	$567	$797	$999	$1,432	$1,035	$1,744	$416	$1,117
2035	$118,570	$7,905,240	$2,280,440	$1,474,547	$2,561,015	$2,936,160	$2,069,422	$30,457,465	$2,186,932	$1,683,708	$60,594	$0	$1,744,302	$92	$705	$581	$817	$1,024	$1,468	$1,061	$1,814	$426	$1,153
2036	$121,534	$8,102,871	$2,338,022	$1,511,411	$2,625,040	$3,009,564	$2,121,158	$31,674,287	$2,241,605	$1,683,708	$62,109	$0	$1,745,817	$94	$722	$596	$837	$1,050	$1,505	$1,088	$1,886	$437	$1,190
2037	$124,572	$8,305,442	$2,397,348	$1,549,196	$2,690,666	$3,084,803	$2,174,187	$32,939,745	$2,297,645	$1,683,708	$63,662	$0	$1,747,369	$96	$740	$611	$858	$1,076	$1,542	$1,115	$1,962	$448	$1,230
2038	$127,687	$8,513,079	$2,458,474	$1,587,926	$2,757,933	$3,161,923	$2,228,542	$34,255,784	$2,355,086	$1,683,708	$65,253	$0	$1,748,961	$99	$759	$626	$879	$1,103	$1,581	$1,143	$2,040	$459	$1,270
2039	$130,879	$8,725,906	$2,521,459	$1,627,624	$2,826,881	$3,240,971	$2,284,255	$35,624,425	$2,413,963	$1,683,708	$66,885	$0	$1,750,592	$101	$778	$642	$901	$1,131	$1,620	$1,171	$2,122	$470	$1,312
2040	$134,151	$8,944,053	$2,586,361	$1,668,315	$2,897,553	$3,321,995	$2,341,361	$37,047,772	$2,474,312	$1,683,708	$68,557	$0	$1,752,264	$104	$797	$659	$924	$1,159	$1,661	$1,201	$2,206	$482	$1,355
2041	$137,504	$9,167,654	$2,653,243	$1,710,022	$2,969,992	$3,405,045	$2,399,896	$38,528,013	$2,536,170	$1,683,708	$70,271	$0	$1,753,978	$107	$817	$676	$947	$1,188	$1,703	$1,231	$2,294	$494	$1,400
2042	$140,942	$9,396,846	$2,722,168	$1,752,773	$3,044,242	$3,490,171	$2,459,893	$40,067,421	$2,599,575	$1,683,708	$72,027	$0	$1,755,735	$109	$838	$694	$971	$1,218	$1,745	$1,261	$2,386	$507	$1,447
2043	$144,466	$9,631,767	$2,793,203	$1,796,592	$3,120,348	$3,577,425	$2,521,390	$41,668,363	$2,664,564	$1,683,708	$73,828	$0	$1,757,536	$112	$859	$712	$995	$1,248	$1,789	$1,293	$2,481	$519	$1,495
2044	$148,077	$9,872,561	$2,866,414	$1,841,507	$3,198,357	$3,666,861	$2,584,425	$43,333,298	$2,731,178	$1,683,708	$75,674	$0	$1,759,382	$115	$880	$730	$1,020	$1,279	$1,833	$1,325	$2,581	$532	$1,545
2045	$151,779	$10,119,375	$2,941,874	$1,887,545	$3,278,316	$3,758,533	$2,649,036	$45,064,786	$2,799,457	$1,683,708	$77,566	$0	$1,761,273	$118	$902	$750	$1,045	$1,311	$1,879	$1,358	$2,684	$546	$1,596
2046	$155,574	$10,372,360	$3,019,654	$1,934,733	$3,360,274	$3,852,496	$2,715,261	$46,865,488	$2,869,444	$1,683,708	$79,505	$0	$1,763,213	$121	$925	$769	$1,071	$1,344	$1,926	$1,392	$2,791	$559	$1,650
2047	$159,463	$10,631,669	$3,099,830	$1,983,102	$3,444,281	$3,948,808	$2,783,143	$48,738,170	$2,941,180	$1,683,708	$81,492	$0	$1,765,200	$124	$948	$790	$1,098	$1,378	$1,974	$1,427	$2,902	$573	$1,705
2048	$163,450	$10,897,460	$3,182,481	$2,032,679	$3,530,388	$4,047,528	$2,852,722	$50,685,711	$3,014,709	$1,683,708	$83,530	$0	$1,767,237	$127	$971	$811	$1,126	$1,412	$2,024	$1,463	$3,018	$588	$1,763
2049	$167,536	$11,169,897	$3,267,686	$2,083,496	$3,618,647	$4,148,717	$2,924,040	$52,711,104	$3,090,077	$1,683,708	$85,618	$0	$1,769,326	$130	$996	$833	$1,154	$1,447	$2,074	$1,500	$3,139	$602	$1,822
2050	$171,724	$11,449,144	$3,355,529	$2,135,584	$3,709,113	$4,252,435	$2,997,141	$54,817,462	$3,167,329	$1,683,708	$87,758	$0	$1,771,466	$133	$1,021	$855	$1,183	$1,484	$2,126	$1,537	$3,264	$617	$1,884
2051	$176,017	$11,735,373	$3,446,097	$2,188,973	$3,801,841	$4,358,745	$3,072,069	$57,008,022	$3,246,512	$1,683,708	$89,952	$0	$1,773,660	$136	$1,046	$878	$1,212	$1,521	$2,179	$1,575	$3,395	$633	$1,948
2052	$180,418	$12,028,757	$3,539,478	$2,243,698	$3,896,887	$4,467,714	$3,148,871	$59,286,151	$3,327,675	$1,683,708	$92,201	$0	$1,775,909	$140	$1,072	$902	$1,242	$1,559	$2,234	$1,615	$3,531	$649	$2,014
2053	$184,928	$12,329,476	$3,635,765	$2,299,790	$3,994,309	$4,579,407	$3,227,593	$61,655,351	$3,410,867	$1,683,708	$94,506	$0	$1,778,214	$143	$1,099	$926	$1,273	$1,598	$2,290	$1,655	$3,672	$665	$2,083
2054	$189,551	$12,637,713	$3,735,054	$2,357,285	$4,094,167	$4,693,892	$3,308,282	$64,119,262	$3,496,139	$1,683,708	$96,869	$0	$1,780,577	$147	$1,127	$952	$1,305	$1,638	$2,347	$1,697	$3,818	$681	$2,154
2055	$194,290	$12,953,656	$3,837,443	$2,416,217	$4,196,521	$4,811,239	$3,390,990	$66,681,672	$3,583,542	$1,683,708	$99,291	$0	$1,782,998	$150	$1,155	$978	$1,338	$1,679	$2,406	$1,739	$3,971	$698	$2,228
2056	$199,148	$13,277,497	$3,943,035	$2,476,622	$4,301,434	$4,931,520	$3,475,764	$69,346,520	$3,673,131	$1,683,708	$101,773	$0	$1,785,481	$154	$1,184	$1,005	$1,371	$1,721	$2,466	$1,782	$4,130	$716	$2,304
2057	$204,126	$13,609,435	$4,051,935	$2,538,538	$4,408,970	$5,054,808	$3,562,658	$72,117,900	$3,764,959	$0	$104,317	$0	$104,317	$158	$1,213	$1,032	$1,406	$1,764	$2,527	$1,827	$4,295	$734	$2,347
2058	$209,229	$13,949,670	$4,164,252	$2,602,001	$4,519,195	$5,181,179	$3,651,725	$75,000,075	$3,859,083	$0	$106,925	$0	$106,925	$162	$1,244	$1,061	$1,441	$1,808	$2,591	$1,873	$4,466	$752	$2,429
2059	$214,460	$14,298,412	$4,280,101	$2,667,051	$4,632,174	$5,310,708	$3,743,018	$77,997,472	$3,955,560	$0	$109,598	$0	$109,598	$166	$1,275	$1,090	$1,477	$1,853	$2,655	$1,919	$4,645	$771	$2,515
2060	$219,822	$14,655,873	$4,399,597	$2,733,728	$4,747,979	$5,443,476	$3,836,593	$81,114,700	$4,054,449	$0	$112,338	$0	$112,338	$170	$1,306	$1,121	$1,514	$1,899	$2,722	$1,967	$4,831	$790	$2,603
2061	$225,317	$15,022,269	$4,522,863	$2,802,071	$4,866,678	$5,579,563	$3,932,508	$84,356,551	$4,155,810	$0	$115,147	$0	$115,147	$175	$1,339	$1,152	$1,552	$1,947	$2,790	$2,017	$5,024	$810	$2,694
2062	$230,950	$15,397,826	$4,650,025	$2,872,123	$4,988,345	$5,719,052	$4,030,821	$87,728,007	$4,259,706	$0	$118,025	$0	$118,025	$179	$1,373	$1,185	$1,590	$1,995	$2,860	$2,067	$5,224	$830	$2,789
2063	$236,724	$15,782,772	$4,781,211	$2,943,926	$5,113,054	$5,862,028	$4,131,591	$91,234,252	$4,366,198	$0	$120,976	$0	$120,976	$183	$1,407	$1,218	$1,630	$2,045	$2,931	$2,119	$5,433	$851	$2,887
2064	$242,642	$16,177,341	$4,916,556	$3,017,524	$5,240,880	$6,008,579	$4,234,881	$94,880,674	$4,475,353	$0	$124,000	$0	$124,000	$188	$1,442	$1,253	$1,671	$2,096	$3,004	$2,172	$5,650	$872	$2,989
2065	$248,708	$16,581,775	$5,056,200	$3,092,962	$5,371,902	$6,158,793	$4,340,753	$98,672,880	$4,587,237	$0	$127,100	$0	$127,100	$193	$1,478	$1,288	$1,713	$2,149	$3,079	$2,226	$5,876	$894	$3,094
2066	$254,926	$16,996,319	$5,200,286	$3,170,286	$5,506,200	$6,312,763	$4,449,272	$102,616,698	$4,701,918	$0	$130,278	$0	$130,278	$197	$1,515	$1,325	$1,756	$2,202	$3,156	$2,282	$6,111	$916	$3,204
2067	$261,299	$17,421,227	$5,348,964	$3,249,543	$5,643,855	$6,470,582	$4,560,504	$106,718,191	$4,819,466	$0	$133,535	$0	$133,535	$202	$1,553	$1,363	$1,799	$2,258	$3,235	$2,339	$6,355	$939	$3,317
2068	$267,831	$17,856,758	$5,502,388	$3,330,782	$5,784,951	$6,632,347	$4,674,517	$110,983,665	$4,939,953	$0	$136,873	$0	$136,873	$207	$1,592	$1,402	$1,844	$2,314	$3,316	$2,397	$6,609	$963	$3,435
2069	$274,527	$18,303,176	$5,660,719	$3,414,051	$5,929,575	$6,798,155	$4,791,379	$115,419,677	$5,063,451	$0	$140,295	$0	$140,295	$213	$1,632	$1,442	$1,890	$2,372	$3,399	$2,457	$6,873	$987	$3,557
2070	$281,390	$18,760,756	$5,824,120	$3,499,403	$6,077,814	$6,968,109	$4,911,164	$120,033,045	$5,190,038	$0	$143,802	$0	$143,802	$218	$1,672	$1,484	$1,938	$2,431	$3,484	$2,519	$7,148	$1,012	$3,683
2071	$288,425	$19,229,775	$5,992,764	$3,586,888	$6,229,760	$7,142,312	$5,033,943	$124,830,863	$5,319,789	$0	$147,397	$0	$147,397	$223	$1,714	$1,527	$1,986	$2,492	$3,571	$2,582	$7,434	$1,037	$3,814
2072	$295,636	$19,710,519	$6,166,828	$3,676,560	$6,385,504	$7,320,870	$5,159,792	$129,820,506	$5,452,783	$0	$151,082	$0	$151,082	$229	$1,757	$1,571	$2,036	$2,554	$3,660	$2,646	$7,731	$1,063	$3,950

Table C-4c. Melded Costs for Water Supplies -- Aggregate of All Agencies for Basin Optimization Scenario 3

	Total Annual Cost									Capital Costs - Scenario 3a			Unit Cost								
Year	Puente Basin	Chino Basin	Six Basins	Spadra Basin	Main San Gabriel Basin	Central Basin	San Antonio Creek Water	Imported Water	Recycled Water	Construction	O&M	Total	Puente Basin	Chino Basin	Six Basins	Spadra Basin	Main San Gabriel Basin	Central Basin	San Antonio Creek Water	Imported Water	Recycled Water	Melded Total
2021	$87,451	$5,693,601	$1,079,140	$647,388	$0	$0	$1,464,587	$24,390,117	$1,481,785	$0	$0	$0	$65	$499	$327	$685			$751	$1,108	$273	$751
2022	$88,731	$5,788,502	$1,684,388	$724,477	$0	$0	$1,501,201	$24,516,515	$1,520,531	$0	$0	$0	$67	$511	$429	$609			$770	$1,147	$282	$771
2023	$90,021	$5,884,590	$1,727,435	$805,015	$0	$0	$1,538,731	$25,718,039	$1,560,288	$0	$0	$0	$68	$524	$440	$562			$789	$1,204	$291	$801
2024	$91,319	$5,981,864	$1,772,002	$970,666	$0	$0	$1,577,199	$26,981,886	$1,601,083	$0	$0	$0	$70	$537	$451	$579			$809	$1,264	$301	$835
2025	$92,626	$6,080,323	$1,814,729	$1,126,535	$2,000,661	$2,293,723	$1,616,629	$22,137,604	$1,642,943	$0	$0	$0	$72	$551	$462	$586	$800	$1,147	$829	$1,316	$311	$830
2026	$94,942	$6,242,037	$1,850,854	$1,145,165	$2,050,677	$2,351,066	$1,657,045	$22,550,763	$1,677,985	$0	$0	$0	$74	$564	$472	$603	$820	$1,176	$850	$1,341	$319	$848
2027	$97,316	$6,408,036	$1,890,237	$1,164,023	$2,101,944	$2,409,843	$1,698,471	$23,114,925	$1,713,752	$0	$0	$0	$75	$578	$482	$621	$841	$1,205	$871	$1,375	$328	$870
2028	$99,749	$6,578,433	$1,930,085	$1,183,108	$2,154,493	$2,470,089	$1,740,933	$23,661,850	$1,750,260	$0	$0	$0	$77	$593	$492	$639	$862	$1,235	$893	$1,408	$337	$892
2029	$102,242	$6,753,346	$1,972,384	$1,246,809	$2,208,355	$2,531,841	$1,784,456	$24,309,150	$1,787,521	$0	$0	$0	$79	$608	$503	$682	$883	$1,266	$915	$1,447	$346	$917
2030	$104,798	$6,932,892	$2,016,873	$1,582,236	$2,263,564	$2,595,137	$1,829,068	$20,554,562	$2,577,192	$13,041,286	$589,437	$13,630,723	$81	$623	$514	$876	$905	$1,298	$938	$1,490	$502	$1,163
2031	$107,418	$7,117,323	$2,066,507	$1,621,792	$2,320,153	$2,660,016	$1,874,795	$21,375,849	$2,641,622	$13,041,286	$604,173	$13,645,459	$83	$638	$526	$898	$928	$1,330	$961	$1,550	$515	$1,191
2032	$110,104	$7,306,642	$2,117,632	$1,662,337	$2,378,157	$2,726,516	$1,921,664	$22,229,966	$2,707,663	$13,041,286	$619,277	$13,660,563	$85	$654	$540	$921	$951	$1,363	$985	$1,612	$528	$1,220
2033	$112,856	$7,500,979	$2,170,297	$1,703,895	$2,437,611	$2,794,679	$1,969,706	$23,118,225	$2,775,354	$13,041,286	$634,759	$13,676,045	$87	$671	$553	$944	$975	$1,397	$1,010	$1,676	$541	$1,251
2034	$115,678	$7,700,466	$2,224,549	$1,746,493	$2,498,551	$2,864,546	$2,018,949	$24,041,990	$2,844,738	$13,041,286	$650,628	$13,691,914	$90	$688	$567	$967	$999	$1,432	$1,035	$1,743	$554	$1,282
2035	$118,570	$7,905,240	$2,280,440	$1,790,155	$2,561,015	$2,936,160	$2,069,422	$25,002,682	$2,915,857	$13,041,286	$666,893	$13,708,180	$92	$705	$581	$991	$1,024	$1,468	$1,061	$1,813	$568	$1,315
2036	$121,534	$8,102,871	$2,338,022	$1,834,909	$2,625,040	$3,009,564	$2,121,158	$26,001,777	$2,988,753	$13,041,286	$683,566	$13,724,852	$94	$722	$596	$1,016	$1,050	$1,505	$1,088	$1,885	$582	$1,349
2037	$124,572	$8,305,442	$2,397,348	$1,880,782	$2,690,666	$3,084,803	$2,174,187	$27,040,811	$3,063,472	$13,041,286	$700,655	$13,741,941	$96	$740	$611	$1,041	$1,076	$1,542	$1,115	$1,961	$597	$1,384
2038	$127,687	$8,513,079	$2,458,474	$1,927,801	$2,757,933	$3,161,923	$2,228,542	$28,121,380	$3,140,059	$13,041,286	$718,171	$13,759,458	$99	$759	$626	$1,068	$1,103	$1,581	$1,143	$2,039	$612	$1,420
2039	$130,879	$8,725,906	$2,521,459	$1,975,996	$2,826,881	$3,240,971	$2,284,255	$29,245,145	$3,218,560	$13,041,286	$736,126	$13,777,412	$101	$778	$642	$1,094	$1,131	$1,620	$1,171	$2,120	$627	$1,458
2040	$134,151	$8,944,053	$2,586,361	$2,025,396	$2,897,553	$3,321,995	$2,341,361	$30,413,833	$3,299,024	$13,041,286	$754,529	$13,795,815	$104	$797	$659	$1,122	$1,159	$1,661	$1,201	$2,205	$643	$1,497
2041	$137,504	$9,167,654	$2,653,243	$2,076,031	$2,969,992	$3,405,045	$2,399,896	$31,629,241	$3,381,500	$13,041,286	$773,392	$13,814,678	$107	$817	$676	$1,150	$1,188	$1,703	$1,231	$2,293	$659	$1,537
2042	$140,942	$9,396,846	$2,722,168	$2,127,932	$3,044,242	$3,490,171	$2,459,893	$32,893,237	$3,466,037	$13,041,286	$792,727	$13,834,013	$109	$838	$694	$1,178	$1,218	$1,745	$1,261	$2,385	$676	$1,578
2043	$144,466	$9,631,767	$2,793,203	$2,181,130	$3,120,348	$3,577,425	$2,521,390	$34,207,763	$3,552,688	$13,041,286	$812,545	$13,853,831	$112	$859	$712	$1,208	$1,248	$1,789	$1,293	$2,480	$692	$1,622
2044	$148,077	$9,872,561	$2,866,414	$2,235,659	$3,198,357	$3,666,861	$2,584,425	$35,574,840	$3,641,505	$13,041,286	$832,859	$13,874,145	$115	$880	$730	$1,238	$1,279	$1,833	$1,325	$2,579	$710	$1,666
2045	$151,779	$10,119,375	$2,941,874	$2,291,550	$3,278,316	$3,758,533	$2,649,036	$36,996,569	$3,732,543	$13,041,286	$853,680	$13,894,966	$118	$902	$750	$1,269	$1,311	$1,879	$1,358	$2,682	$727	$1,712
2046	$155,574	$10,372,360	$3,019,654	$2,348,839	$3,360,274	$3,852,496	$2,715,261	$38,475,136	$3,825,857	$13,041,286	$875,022	$13,916,308	$121	$925	$769	$1,301	$1,344	$1,926	$1,392	$2,790	$746	$1,760
2047	$159,463	$10,631,669	$3,099,830	$2,407,560	$3,444,281	$3,948,808	$2,783,143	$40,012,813	$3,921,503	$13,041,286	$896,898	$13,938,184	$124	$948	$790	$1,333	$1,378	$1,974	$1,427	$2,901	$764	$1,810
2048	$163,450	$10,897,460	$3,182,481	$2,467,749	$3,530,388	$4,047,528	$2,852,722	$41,611,964	$4,019,541	$13,041,286	$919,320	$13,960,606	$127	$971	$811	$1,366	$1,412	$2,024	$1,463	$3,017	$783	$1,861
2049	$167,536	$11,169,897	$3,267,686	$2,529,442	$3,618,647	$4,148,717	$2,924,040	$43,275,047	$4,120,029	$13,041,286	$942,303	$13,983,589	$130	$996	$833	$1,401	$1,447	$2,074	$1,500	$3,138	$803	$1,914
2050	$171,724	$11,449,144	$3,355,529	$2,592,678	$3,709,113	$4,252,435	$2,997,141	$45,004,619	$4,223,030	$13,041,286	$965,861	$14,007,147	$133	$1,021	$855	$1,436	$1,484	$2,126	$1,537	$3,263	$823	$1,969
2051	$176,017	$11,735,373	$3,446,097	$2,657,495	$3,801,841	$4,358,745	$3,072,069	$46,803,337	$4,328,606	$13,041,286	$990,007	$14,031,293	$136	$1,046	$878	$1,472	$1,521	$2,179	$1,575	$3,394	$844	$2,025
2052	$180,418	$12,028,757	$3,539,478	$2,723,933	$3,896,887	$4,467,714	$3,148,871	$48,673,968	$4,436,821	$13,041,286	$1,014,757	$14,056,044	$140	$1,072	$902	$1,508	$1,559	$2,234	$1,615	$3,529	$865	$2,084
2053	$184,928	$12,329,476	$3,635,765	$2,792,031	$3,994,309	$4,579,407	$3,227,593	$50,619,387	$4,547,741	$13,041,286	$1,040,126	$14,081,412	$143	$1,099	$926	$1,546	$1,598	$2,290	$1,655	$3,670	$886	$2,145
2054	$189,551	$12,637,713	$3,735,054	$2,861,832	$4,094,167	$4,693,892	$3,308,282	$52,642,583	$4,661,435	$13,041,286	$1,066,129	$14,107,416	$147	$1,127	$952	$1,585	$1,638	$2,347	$1,697	$3,817	$908	$2,208
2055	$194,290	$12,953,656	$3,837,443	$2,933,378	$4,196,521	$4,811,239	$3,390,990	$54,746,668	$4,777,971	$13,041,286	$1,092,783	$14,134,069	$150	$1,155	$978	$1,624	$1,679	$2,406	$1,739	$3,969	$931	$2,274
2056	$199,148	$13,277,497	$3,943,035	$3,006,712	$4,301,434	$4,931,520	$3,475,764	$56,934,876	$4,897,420	$13,041,286	$1,120,102	$14,161,388	$154	$1,184	$1,005	$1,665	$1,721	$2,466	$1,782	$4,128	$954	$2,341
2057	$204,126	$13,609,435	$4,051,935	$3,081,880	$4,408,970	$5,054,808	$3,562,658	$59,210,571	$5,019,855	$13,041,286	$1,148,105	$14,189,391	$158	$1,213	$1,032	$1,707	$1,764	$2,527	$1,827	$4,293	$978	$2,411
2058	$209,229	$13,949,670	$4,164,252	$3,158,927	$4,519,195	$5,181,179	$3,651,725	$61,577,251	$5,145,352	$13,041,286	$1,176,807	$14,218,094	$162	$1,244	$1,061	$1,749	$1,808	$2,591	$1,873	$4,465	$1,003	$2,484
2059	$214,460	$14,298,412	$4,280,101	$3,237,900	$4,632,174	$5,310,708	$3,743,018	$64,038,555	$5,273,986	$13,041,286	$1,206,228	$14,247,514	$166	$1,275	$1,090	$1,793	$1,853	$2,655	$1,919	$4,643	$1,028	$2,559
2060	$219,822	$14,655,873	$4,399,597	$3,318,848	$4,747,979	$5,443,476	$3,836,593	$66,598,266	$5,405,835	$0	$1,236,383	$1,236,383	$170	$1,306	$1,121	$1,838	$1,899	$2,722	$1,967	$4,829	$1,054	$2,357
2061	$225,317	$15,022,269	$4,522,863	$3,401,819	$4,866,678	$5,579,563	$3,932,508	$69,260,320	$5,540,981	$0	$1,267,293	$1,267,293	$175	$1,339	$1,152	$1,884	$1,947	$2,790	$2,017	$5,022	$1,080	$2,438
2062	$230,950	$15,397,826	$4,650,025	$3,486,864	$4,988,345	$5,719,052	$4,030,821	$72,028,809	$5,679,506	$0	$1,298,975	$1,298,975	$179	$1,373	$1,185	$1,931	$1,995	$2,860	$2,067	$5,223	$1,107	$2,521
2063	$236,724	$15,782,772	$4,781,211	$3,574,036	$5,113,054	$5,862,028	$4,131,591	$74,907,989	$5,821,493	$0	$1,331,450	$1,331,450	$183	$1,407	$1,218	$1,979	$2,045	$2,931	$2,119	$5,431	$1,135	$2,607
2064	$242,642	$16,177,341	$4,916,556	$3,663,387	$5,240,880	$6,008,579	$4,234,881	$77,902,288	$5,967,031	$0	$1,364,736	$1,364,736	$188	$1,442	$1,253	$2,029	$2,096	$3,004	$2,172	$5,648	$1,163	$2,697
2065	$248,708	$16,581,775	$5,056,200	$3,754,971	$5,371,902	$6,158,793	$4,340,753	$81,016,307	$6,116,206	$0	$1,398,854	$1,398,854	$193	$1,478	$1,288	$2,079	$2,149	$3,079	$2,226	$5,874	$1,192	$2,790
2066	$254,926	$16,996,319	$5,200,286	$3,848,846	$5,506,200	$6,312,763	$4,449,272	$84,254,836	$6,269,111	$0	$1,433,826	$1,433,826	$197	$1,515	$1,325	$2,131	$2,202	$3,156	$2,282	$6,109	$1,222	$2,886
2067	$261,299	$17,421,227	$5,348,964	$3,945,067	$5,643,855	$6,470,582	$4,560,504	$87,622,853	$6,425,839	$0	$1,469,671	$1,469,671	$202	$1,553	$1,363	$2,185	$2,258	$3,235	$2,339	$6,353	$1,252	$2,986
2068	$267,831	$17,856,758	$5,502,388	$4,043,694	$5,784,951	$6,632,347	$4,674,517	$91,125,537	$6,586,485	$0	$1,506,413	$1,506,413	$207	$1,592	$1,402	$2,239	$2,314	$3,316	$2,397	$6,607	$1,284	$3,089
2069	$274,527	$18,303,176	$5,660,719	$4,144,786	$5,929,575	$6,798,155	$4,791,379	$94,768,271	$6,751,147	$0	$1,544,073	$1,544,073	$213	$1,632	$1,442	$2,295	$2,372	$3,399	$2,457	$6,871	$1,316	$3,196
2070	$281,390	$18,760,756	$5,824,120	$4,248,406	$6,077,814	$6,968,109	$4,911,164	$98,556,658	$6,919,926	$0	$1,582,675	$1,582,675	$218	$1,672	$1,484	$2,353	$2,431	$3,484	$2,519	$7,146	$1,349	$3,307
2071	$288,425	$19,229,775	$5,992,764	$4,354,616	$6,229,760	$7,142,312	$5,033,943	$102,496,522	$7,092,924	$0	$1,622,242	$1,622,242	$223	$1,714	$1,527	$2,411	$2,492	$3,571	$2,582	$7,432	$1,382	$3,421
2072	$295,636	$19,710,519	$6,166,828	$4,463,481	$6,385,504	$7,320,870	$5,159,792	$106,593,921	$7,270,247	$0	$1,662,798	$1,662,798	$229	$1,757	$1,571	$2,472	$2,554	$3,660	$2,646	$7,729	$1,417	$3,540

Appendix D

Comments and Responses of Draft Technical Memorandum 5 – Part 2

Appendix D – Comments and Responses on the September 2021 Draft Technical Memorandum 5 (TM 5) Part 2: Sustainability of Basin Optimization Scenarios

Comments by Erinn Wilson-Olgin, Environmental Program Manager, California Department of Fish and Wildlife (Department)

The Department appreciates the opportunity to provide comments on the Spadra Basin Groundwater Sustainability Agency (GSA) Spadra Basin (Basin) Draft Groundwater Sustainability Plan (GSP) Draft Technical Memorandum No. 5 Part 2: Sustainability of Basin Optimization Scenarios (TM5) prepared pursuant to the Sustainable Groundwater Management Act (SGMA). The Basin must be managed under a GSP by January 31, 2022.

The Department is writing to support ecosystem preservation and enhancement in compliance with SGMA and its implementing regulations based on Department's expertise and best available information and science. As trustee agency for the State's fish and wildlife resources, the Department has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and the habitat necessary for biologically sustainable populations of such species (Fish & Game Code §§ 711.7 and 1802).

Development and implementation of GSPs under SGMA represents a new era of California groundwater management. The Department has an interest in the sustainable management of groundwater, as many sensitive ecosystems, species, and public trust resources depend on groundwater and interconnected surface waters (ISWs), including ecosystems on Department-owned and managed lands within SGMA-regulated basins.

[…]

There are two major streams that flow through the Basin, San Jose Creek and South San Jose Creek. These streams are a resource that supports wildlife within the Basin. Projects proposed as part of the Basin Optimization Scenarios plan to divert stormwater from streams. These activities may be subject to Fish and Game Code section 1602. In addition, pertaining to the protection of these resources, the Department provides comments to the consideration of impacts to wildlife as a result of the reduction of water availability from stormwater diversion.

[End Letter]

Attachment A: CDFW COMMENTS ON THE GSA/BASIN TECHNICAL MEMORANDUM FOR THE GROUNDWATER SUSTAINABILITY PLAN

The following comments are applicable to what is only presented in Part 2 "Sustainability of Basin Optimization Scenarios" of TM5.

Comment No. 1. Potential Projects and Management Plan Concepts, Table 2-1 Proposed Projects and Management Actions for the Spadra Basin (pp3).

Issue: Table 2-1 in TM5 identifies potential projects for the Basin. One project will redirect stormwater flows to new spreading grounds while another project will construct rubber dams in the San Jose Creek to divert storm water for recharge (projects numbers 3 and 12 respectively). The Department is concerned over the projected stormwater diversion projects. Fish and Game Code section 1602 requires any person, State or local governmental agency, or public utility to notify Department prior to beginning any activity that may do one or more of the following:

I. Divert or obstruct the natural flow of any river, stream, or lake;

II. Change the bed, channel, or bank of any river, stream, or lake;

III. Use material from any river, stream, or lake; or

IV. Deposit or dispose of material into any river, stream, or lake.

In addition, the Department is concerned that project activities may prevent and/or impede fish passage during low flow conditions and may not allow sufficient water to pass over, around or through a dam any fish that may be planted or exist below the dam (Fish & Game Code, §§ 5901, 5937). The project may adversely affect the existing hydrologic pattern in the proposed project areas that allow water to flow into San Jose Creek. This may occur through the alteration of the bank, bed, or channel of the stream, which could result in permanent alteration of the Creek function. This permanent impact may impact wildlife species that may utilize this stream area and will require compensatory mitigation. Additionally, associated riparian plant communities are present downstream of the project site that may be impacted by changes to the stream. Accordingly, impacts to sensitive or rare riparian plant communities may occur.

Recommendation #1: The Spadra Basin GSP as developed under SGMA is exempt from the California Environmental Quality Act (CEQA). However, project and management actions needed to achieve basin sustainability, such as artificial recharge from storm water capture, are subject to CEQA. The Department will likely have a CEQA review and permitting nexus with groundwater project and management actions (e.g., Lake and Streambed Alteration Agreements). Accordingly, the Department will expect CEQA lead agencies to thoroughly address proposed groundwater management project impacts (i.e., 'significant effects') to streambed, groundwater dependent ecosystems, interconnected surface waters, as well as fish and wildlife resources. The Department recommends including this information in the basin optimization scenarios to ensure project budgets and timelines consider the regulatory process in the implementation of potential projects.

Recommendation #2: The Department recommends the final GSP require projects to comply with Fish and Game code sections 5901 and 5937. The GSP should require projects provide a thorough discussion of direct, indirect, and cumulative impacts expected to adversely affect biological resources, especially fish species, with specific measures to offset such impacts.

Response to Comment No. 1. The three Basin Optimization Scenarios developed and evaluated in TM 5 do not include any of the potential stormwater diversion projects listed in Table 2-1 in TM 5. The preferred Basin Optimization Scenario in TM 5 and ultimately in the GSP is Scenario 3. Therefore, at this time there are no envisioned projects for storm water diversion projects for recharge GSP, and the GSP will not discuss any impacts expected to adversely affect biological resources for these projects. If the GSA decides to pursue projects that include stormwater diversion for recharge, it will consider all impacts as noted in these recommendations, acquire all required permits, and comply Fish and Game code sections 5901 and 5937.

The projects in Basin Optimization Scenarios 3 are conceptual at this time, and further planning and studies are required to analyze project feasibility and environmental impacts, and move towards project implementation. All projects to be implemented for the Spadra Basin GSP will be evaluated through the appropriate CEQA analyses, including the necessary analyses for potential impacts to biological resources. The cost and schedule to perform CEQA analyses is considered in the project budgets and timelines.

Comment No. 2. Potential Projects and Management Plan Concepts, Table 2-1 Proposed Projects and Management Actions for the Spadra Basin (pp3)

Issue: The Department is concerned over the impact to water availability for avian species in San Jose Creek specifically for project numbers 3 and 12 as identified in Table 2-1. Aerial photography indicates the presences of algal mats downstream of the proposed projects. Changes to the availability of water may impact biotic resources in the area of and downstream of the proposed projects. The current hydrology in San Jose Creek allows phytoplankton (algae and cyanobacteria), microorganisms, and herbaceous vegetation to establish. The algae provide habitat and a food source for benthic invertebrates, a vital food source for wading birds. In addition, wading birds also feed on herbaceous vegetation. Changes to hydrology by diverting water from the creek are reasonable potential direct and indirect physical changes in the environment.

Recommendation: The Department recommends the final GSP require projects to submit an analysis of potential impacts on biological resources within the creek resulting from proposed projects. At a minimum, an analysis should include:

I. A map of plant communities and important bird foraging habitat occurring in the project area, namely within and around San Jose Creek and South San Jose Creek. Plant communities should be mapped at the alliance/association level using the Manual of California Vegetation, second edition (Sawyer et al. 2009);

II. A comprehensive list of sensitive and special status plant and wildlife species, and sensitive plant communities, occurring in the project site. For each biological resource, provide:

    1. A summary of species-specific habitat requirements;

    2. A discussion as to how the species or plant community may be significantly

impacted directly or indirectly through habitat modification, as result of changes to hydrology (reduced flow), hydraulics (water depth, wetted perimeter, velocity), and sunlight exposure (photosynthetic ability of plants and algae); and

3. A quantitative analysis and/or adequate discussion to evaluate whether the project would result in those significant impacts.

III. A discussion of whether construction, operations, and maintenance of the new park would have direct and/or indirect, permanent or temporal impact on biological resources;

IV. A discussion of project-related impacts on biological resources in relation cumulative changes to the hydrologic regime; and

V. Avoidance and/or mitigation measures that would be implemented for potential impacts on biological resources if they are present.

Response to Comment No. 2. The three Basin Optimization Scenarios developed and evaluated in TM 5 do not include the potential projects 3 and 12 listed in Table 2-1 that would modify flow in San Jose Creek. The preferred Basin Optimization Scenario in TM 5 and the GSP is Scenario 3. Therefore, at this time the final GSP will not include projects for the submission of an analysis of potential impacts on biological resources within the creek resulting from proposed projects.

All projects to be implemented for the Spadra Basin GSP will be evaluated through the appropriate CEQA analyses, including the necessary analyses for potential impacts to biological resources. The cost and schedule to perform CEQA analyses is considered in the project budgets and timelines in the GSP.

Comment No. 3. Basin Optimization Scenarios (pp7)

Issue: According to the TM5: "If the final GSP includes the utilization of the surplus recycled water from the Pomona WRP, the GSP implementation plan will include a contingency plan to address the uncertainty of the future availability of all or part of the surplus recycled water. The contingency plan will include a description of the options for alternative water sources for recharge and projects and management strategies if the surplus recycled water is no longer available." The Department looks forward to reviewing the contingency plan in the final GSP.

Recommendation: The Department looks forward to the forthcoming final GSP and included contingency plan that will identify actions to address:

I. Uncertainty of the future availability of all/part of the surplus recycled water.

II. Identifying alternative water sources for recharge.

III. Identifying projects and management strategies if the surplus recycled water is no longer available.

Response to Comment No. 3. *Section 6 Plan Implementation* of the GSP includes a description of how the projects in Basin Optimization Scenario 3 will be taken from the concepts described in the GSP to final design and then through construction in a phased approach of implementation.

The development of a contingency plan to address the uncertainty of the future availability of surplus recycled water will be developed during the planning phases (Phases 1 and 2) of the project implementation. Updates have been made to TM 5 on Page 7 to describe the development of the contingency plan.

Conclusion

The Department appreciates the opportunity to comment on the draft TM5 GSP. The Department also appreciates the ongoing coordination and collaboration with the GSA. Though the Spadra Basin thoroughly addresses the benefits of each of the Basin Optimization Scenarios presented, the Department recommends that Spadra Basin GSA address the above comments. This is to avoid a potential 'incomplete' or 'inadequate' future GSP determination per SGMA Regulations, as assessed by the Department of Water Resources.

Comments by Robert C. Ferrante, Chief Engineer and General Manager, Los Angeles County Sanitation Districts

Comment No. 1

General comment: As noted in an earlier TM, recycled water from the Pomona WRP is already apportioned out to multiple users. Utilizing any "surplus" water for recharge would need to be conducted under one of the existing recycled water contracts and potentially discussed with all current contract holders. Additionally, some of the purveyors have discussed plans to capture and utilize additional recycled water flows via storage reservoirs which is not mentioned in the TM. If these plans come to fruition, less "surplus" water may be available than considered in this analysis.

Response to Comment No. 1

The Spadra Basin GSA is the proponent for these projects that will use surplus recycled water. The two parties of the Spadra Basin GSA are the WVWD and Pomona, which are also the two contractual holders for the recycled water from the Pomona WRP. Section 6 Plan Implementation of the GSP includes a description of how the projects in Basin Optimization Scenario 3 will be taken from the concepts described in the GSP to final design and then through construction in a phased approach of implementation. During this implementation process, WVWD and Pomona will work together and with the LACSD on their preferred use of surplus recycled water.

Comment No. 2

The critical point of the entire GSP effort is found on page 4 of TM-5 Part 1 which states, *"All three Basin Optimization Scenarios include the use of surplus recycled water from the Pomona WRP to achieve the objectives of the scenarios."* It then identifies *"about 3.3 million gallons per day (mgd) or about 3,500 AFY"* of Pomona WRP effluent discharged to the concrete-lined South Fork of San Jose Creek that can be reduced to zero based on the SWRCB October 2020 approval of the Change Petition filed by the LACSD. If the entire GSP hinges on the use of the unused Pomona WRP recycled water discharged to the San Jose Creek, then the Spadra Basin GSA should

include a discussion of the significant impediments that would need to be addressed and overcome prior to the use of recycled water for their intended purposes. Some of the more important impediments are listed as follows:

- For Optimization Scenario 1, groundwater production at CPP would be replaced with 430 AFY of "surplus" water from the Pomona WRP, with no recharge option. While this TM states that such surplus water exists during the demand months, it is generally discharged to the San Jose Creek because there is no opportunity for use at any particular moment on any particular day. The mere fact that there is river discharge occurring even during summer months does not mean that any of it could actually be captured and put to beneficial use at CPP. This is literally what we have been trying to do for quite some time at the Pomona WRP.
- Optimization Scenarios 2 & 3: These options considers recharge of recycled water via injection wells. It should be noted that recharge via injection of recycled water requires the recycled water to be advanced treated, which the Pomona WRP effluent is not. If these options are considered, additional treatment would need to be constructed by the project proponents for the recycled water prior to recharge via injection. It should be noted that the type of advanced treatment required for injection of recycled water typically comes at a high cost. This is not currently mentioned or considered in the analysis. Additionally, it should be noted that dilution water would be required for recharge via spreading basins and available sources would need to be considered.
- Optimization Scenario 2 assumes many of the potential recharge sites can be supplied with existing recycled water distribution lines (i.e., City of Pomona). This arrangement would be difficult to manage in terms of using only "surplus" water for recharge due to how recycled water from the Pomona WRP is currently supplied to the existing purveyors. For example, the basin managers would not only need to know when "surplus" recycled water was available (e.g., discharge from the WRP into San Jose Creek) before they started diversions to recharge but would also have to know precisely when the "surplus" water was no longer available at the same time they were diverting recycled water out of the Pomona transmission system. Invariably, someone would be short-changed in this arrangement, most likely WVWD.

Response to Comment No. 2

The proposed projects envisioned in the Basin Optimization Scenarios have thus far been described and evaluated at a conceptual level in TM 5 to characterize and assess the basin response and cost of implementation. The preferred Basin Optimization Scenario is Scenario 3. The next steps towards implementing the proposed projects in Scenario 3 is a planning process to take from concept to design and then to construction. This planning process is described in GSP in Section 6 Plan Implementation as four major phases of project planning and implementation. The impediments and challenges listed above are valid. These types of issues and details will be the considered during the planning process as the projects are reviewed,

refined, screened, and assessed for feasibility, before completing the final design and construction.

As noted in the second bullet in Comment No. 2, recharge via injection of recycled water requires the recycled water to be advanced treated, which the Pomona WRP effluent is not. In the preferred Basin Optimization Scenario 3, recycled water will be injected in combination with advance treatment of all the extracted groundwater at an expanded RO Plant. The Spadra Basin GSA will work with the regulators on obtaining all required permitting and the possibility of treating the groundwater after extraction, and not prior to injection. During the planning process for Basin Optimization Scenario 3, a project alternative can be considered and evaluated for advance treatment prior to injection.

Comment No. 3

Although the TM does acknowledge that groundwater recharge permitting and perhaps an SNMP would be required, it should note that this is quite an extensive process and would take a significant amount of time to complete.

Response to Comment No. 3

On page 64, in the Conclusions and Recommendations section where we discuss the recommended Basin Optimization Scenario 3. The following was added to address Comment No. 3: "Scenario 3 will require permitting from the LA Regional Board with oversight from the State Water Board, and potentially the development of a SNMP for the Spadra Basin or inclusion of the Spadra Basin in the San Gabriel Valley Basin SNMP (Stetson Engineers Inc., 2016). The permitting process and the development of an SNMP are both extensive efforts that will require multiple years to complete. These efforts will be completed during Phase 4 of the planning process necessary for the implementation of these projects that is described in the GSP in Section 6 Implementation Plan. Additionally, the costs and schedule for permitting and development of an SNMP are considered in the cost and schedules presented in the GSP in Sections 6.2 and 6.1."