STAFF REPORT

SUMMARY OF THE CITY OF SIERRA MADRE REPLENISHMENT PROGRAM FOR THE SANTA ANITA SUBAREA

FISCAL YEAR 2017-18

BACKGROUND

The "Santa Anita Subarea" is a subarea of the Raymond Basin under the court-appointed management of the Raymond Basin Management Board (RBMB). Since fiscal year 2000-01, the subarea has experienced declining groundwater levels. Below-average rainfall since fiscal year 2005-06 (excluding fiscal years 2009-10 and 2010-11 when there was about 60 inches of rainfall) exacerbated the water level decrease. The RBMB created a Santa Anita Subarea Ad Hoc group in January 2014, and then created the Sierra Madre Arcadia Aquifer Recovery Team (SMAART) to address the decreasing water levels. The SMAART and the RBMB directed staff to begin collecting monthly water levels in selected wells in the Santa Anita Subarea in March 2014, and provide the monthly report to the RBMB, and to Sierra Madre and Arcadia. This data collection and reporting consists of static groundwater levels, groundwater production, and storm water replenishment.

In September 2015, the City of Sierra Madre proposed to initiate a groundwater replenishment program at the Sierra Madre Spreading Grounds, using (at that time) 100 percent treated Colorado River water from the Metropolitan Water District of Southern California (MWD) to supplement groundwater supplies. During its October 21, 2015 meeting, the RBMB took action to "not oppose" the City of Sierra Madre's plan to deliver treated Colorado River water to the Sierra Madre Spreading Grounds. The City of Sierra Madre provided a letter to the RBMB, dated November 20, 2015 (see

Attachment A), and the City of Arcadia provided a letter to the RBMB, dated January 6, 2016 (see Attachment B), to cooperatively collect data to better understand movement of groundwater within the Santa Anita Subarea and acknowledged the potential impacts to groundwater quality resulting from replenishing the basin with Colorado River water. The location of the Sierra Madre and Arcadia wells is shown in Figure 1. Commencing December 2015, the City of Sierra Madre initiated its replenishment program using imported water. Consequently, additional data was collected, particularly on groundwater quality. This data collection and reporting was added to the monthly SMAART reports and is intended to help manage production and water levels in the Santa Anita Subarea.

Sierra Madre acknowledged in its November 20, 2015 letter, "…the initial replenishment program will occur for up to 12 consecutive months (Pilot Program). At the end of those 12 months, Sierra Madre will temporarily discontinue the Pilot Program until such time a report is prepared by Sierra Madre, distributed to all RBMB members and addressed at a regular RBMB quarterly meeting, or if necessary, at a special meeting of the RBMB. The RBMB will determine if the replenishment program may continue, and, if so, under what terms…. Sierra Madre will organize the data collected (including data provided by SMAART and Arcadia) into a Program report on the results of the Pilot Program, including, but not limited to static water levels, flow direction and groundwater quality. The draft annual report is to be presented to the RBMB Board for review prior to any extension to the Pilot Program."

Subsequently, in an email dated June 26, 2017, the City of Sierra Madre provided the RBMB with a memorandum entitled "Independent 3rd Party Review of the Santa Anita Subarea Monitoring Program, Pilot Study Monthly Reports by Stetson Engineers, for the City of Sierra Madre," dated June 26, 2017, which summarized the Pilot Program for the period of December 2015 through November 2016. The Program Memorandum was discussed at the RBMB July 19, 2017 Board meeting at which time the City of Sierra Madre was authorized to continue the Second Year of the Pilot Program for the period July 1, 2017 through June 30, 2018.

At its July 18, 2018 meeting, the RBMB Board directed staff to prepare this "Summary of the City of Sierra Madre Replenishment Program for the Santa Anita Subarea" for Fiscal Year 2017-18.

SECOND YEAR OF PILOT PROGRAM REPLENISHMENT DELIVERIES (JULY 2017 THROUGH JUNE 2018)

Summary of Replenishment Water Deliveries

Treated Imported Water Replenished

On July 5, 2017, Sierra Madre resumed deliveries of MWD treated imported water to the Sierra Madre Spreading Grounds, marking the start of the Second Year Pilot Replenishment Program. On November 1, 2017, Sierra Madre ceased MWD deliveries for groundwater replenishment. Sierra Madre resumed deliveries of MWD treated imported water to the Sierra Madre Spreading Grounds on June 6, 2018 and those deliveries continued through June 30, 2018. As of June 30, 2018, approximately 1,340 acre-feet of treated imported water delivered by City of Sierra Madre was replenished in the Sierra Madre Spreading Grounds during fiscal year 2017-18.

Treated Imported Water Quality

MWD treated Colorado River water has a Total Dissolved Solids (TDS) concentration of about 630 milligrams per liter (mg/l), which is above the ambient groundwater TDS concentration of about 250 mg/l in the Sierra Madre wellfield and about 340 mg/l in the Arcadia wellfield. MWD treated Colorado River water has Sulfate concentrations of about 240 mg/l, which is above the ambient groundwater Sulfate concentration of about 30 mg/l in the Sierra Madre wellfield and about 45 mg/l in the Arcadia wellfield. The TDS and Sulfate concentrations in the MWD treated Colorado River water are significantly different than ambient groundwater quality. Consequently,

these concentrations may be used as a “tracer” to help determine the movement of groundwater in the Santa Anita Subarea in conjunction with groundwater levels, groundwater production, groundwater quality, and groundwater replenishment. At times, MWD may deliver a blend of Colorado River water and State Water Project water to Sierra Madre.

Sierra Madre collected water samples of MWD treated imported water going into the Sierra Madre Spreading Grounds, to monitor the TDS and Sulfate concentrations. During July and August 2017, the MWD Weymouth Water Treatment Plant was operating at a blend of 75 percent State Water Project (SWP) water and 25 percent Colorado River water. Commencing September 2017, the MWD Weymouth Water Treatment Plant was operating at a blend of 65 percent State Water Project (SWP) water and 35 percent Colorado River water and that blend continued until Sierra Madre ceased deliveries of MWD treated imported water on November 1, 2017. Sierra Madre restarted deliveries of MWD treated imported water to the Sierra Madre Spreading Grounds on June 6, 2018 and those deliveries continued through June 30, 2018. On April 3, 2018, the MWD Weymouth Water Treatment Plant started operating at 100 percent Colorado River water and continued to operate at this blend through June 30, 2018. As discussed, the quality of MWD treated imported water delivered to Sierra Madre varied during fiscal year 2017-18.

Sierra Madre Wells No. 3, No. 4, and No. 5 are essentially right next to the Sierra Madre Spreading Grounds, where spreading of MWD treated imported water is occurring. The location of these wells is shown in Plate 1. It is expected that any water quality differences in the MWD replenishment water will be detected in the Sierra Madre wells relatively quickly. During fiscal year 2017-18, the TDS concentration of the MWD treated imported water ranged from about 250 mg/l to about 630 mg/l, as shown on Figure 2, and the Sulfate concentration of the MWD treated water ranged from about 75 mg/l to about 200 mg/l, as shown on Figure 4.

The ambient TDS concentration at the Sierra Madre wells was about 250 mg/l and the ambient Sulfate concentration at the Sierra Madre wells was about 30 mg/l. During fiscal year 2017-18, the TDS concentrations in Sierra Madre Well No. 3 ranged from about 300 mg/l to about 400 mg/l, as shown on Figures 2A and 2B. The Regional Water Quality Control Board's (RWQCB) Basin Plan Objective for TDS of 450 mg/l, as shown in Figures 2 and 3. During fiscal year 2017-18 there were no test results exceeding a TDS of 450 mg/l. The Sulfate concentration in the Sierra Madre Well No. 3 ranged from about 80 mg/l to about 100 mg/l, as shown on Figures 4A and 4B. The RWQCB's Basin Plan Objective for Sulfate of 100 mg/l, as shown in Figures 4 and 5. During fiscal year 2017-18 it appears there were some test results for Sulfate exceeding 100 mg/l.

The Arcadia Orange Grove wells are essentially downgradient from the Sierra Madre Spreading Grounds. Therefore, the Arcadia wells water quality may change as a result of the MWD replenishment water. The ambient TDS concentration at the Arcadia Orange Grove wells was about 340 mg/l. During fiscal year 2017-18, the TDS concentrations at the Arcadia Orange Grove wells ranged from about 300 mg/l to about 400 mg/l, as shown on Figure 3. The ambient Sulfate concentration at the Arcadia Orange Grove wells was about 45 mg/l. The Sulfate concentration in the Arcadia Orange Grove wells ranged from about 50 mg/l to about 70 mg/l, as shown on Figure 5. It appears the TDS concentration in the Arcadia wells has been impacted by the replenishment program and demonstrated an increased after about 16 months, as shown on Figure 3. The distance between the Sierra Madre and Arcadia wellfields is about 4,000 feet, making the estimated travel time about 3,000 feet/year.

Groundwater Production

Section VI of the 1955 Raymond Basin Judgment specifies the Decreed Rights, in the Eastern Unit of the Raymond Basin, for the City of Arcadia are 3,526 acre-feet and for the City of Sierra Madre are 1,764 acre-feet. However, Section VI(3) of the 1955 Raymond Basin Judgment states the Cities of Arcadia and Sierra Madre

collectively are restrained from "…pumping or otherwise taking water from the ground in said Eastern Unit in any years in excess of the average amount pumped or taken therein during the period 1927-28 to 1937-38, to wit: 3,261 acre feet per annum, during any year in which static groundwater level measurements, made at the time of maximum high water table in the spring season of each year, show that the average water table elevation in the area between Foothill Boulevard and Raymond Fault and between a line 300 feet west of Rosemead Boulevard and a line 100 feet east of Michillinda Avenue,…is higher than that at the Arcadia group of wells…located west of the intersection of Orange Grove and Santa Anita Avenues in the City of Arcadia, this limitation to apply only when the water table elevation at said group is less than 500 feet above level, United States Geological Survey datum." (Emphasis added.)The "500-foot Rule" restricted pumping provision was in place for fiscal year 2017-18.

RBMB staff initially collected meter readings at wells in the Santa Anita Subarea on July 1, 2015, to document monthly production at each well. RBMB staff updates the meter readings and calculates production for City of Sierra Madre and City of Arcadia wells, as shown in Table 1. During fiscal year 2017-18, the total pumping from the Santa Anita Subarea was about 4,020 acre-feet, which is an average of about 335 acre-feet per month. The amount of pumping exceeded the "500-foot Rule" restricted pumping, but was supplemented by Sierra Madre's imported water replenishment program. Santa Anita Subarea pumping and imported water replenishment is described below.

City of Sierra Madre

Sierra Madre's "500-foot Rule" reduced Decreed Rights are 940 acre-feet. On July 5, 2017, Sierra Madre restarted deliveries of MWD treated imported water into the Sierra Madre Spreading Grounds and replenished about 1,340 acre-feet of MWD treated imported water, as of June 30 2018. Sierra Madre produced about 2,235 acre-feet of groundwater through the end of June 2018. The combined water right (940 acre-feet) plus the imported water delivered to the Santa Anita Subarea of 1,340 acre-feet is

2,280 acre-feet (940+1,340 = 2,280). Sierra Madre's reported production is less than the combined water right plus water spread and is in compliance with the Raymond Basin Judgment.

City of Arcadia

Arcadia's "500-foot Rule" reduced Decreed Rights are 2,321 acre-feet. During fiscal year 2017-18, Arcadia produced about 1,783 acre-feet from its Orange Grove Wells, as of June 30, 2018. The reported production is less than the water right and is in compliance with the Raymond Basin Judgment

Static Water Levels

RBMB staff began collecting monthly static water levels on March 6, 2014. The groundwater level data from the Sierra Madre and Arcadia wells for the Second Year of Pilot Program Replenishment deliveries are described below. A summary of static groundwater levels is included in Attachment C.

City of Sierra Madre

The Second Year Pilot Program Replenishment Water deliveries started on July 5, 2017. On November 1, 2017, Sierra Madre ceased MWD deliveries for groundwater replenishment. Sierra Madre restarted deliveries of MWD treated imported water to the Sierra Madre Spreading Grounds on June 6, 2018 and those deliveries continued through June 30, 2018.

Between July 5, 2017 and July 12, 2018 the static water level at Sierra Madre Well No. 3 decreased about seven feet from elevation of about 377 feet above msl to elevation of about 370 feet above msl. In addition, between July 1, 2017 and June 30 , 2018, Sierra Madre produced about 2,235 acre-feet of groundwater, which is

an average of about 185 acre-feet per month and spread about 1,340 acre-feet of treated imported water, which is an average of 110 acre-feet per month. The static water level at City of Sierra Madre Well No. 3, since January 2012, is shown on Plates 2 and 6. In addition, the static water level at Sierra Madre Well No. 3, compared to recent production and replenishment, is shown on Plates 3, 3A, 4A and 4B.

City of Arcadia

The Second Year Pilot Program Replenishment Water Deliveries started on July 5, 2017. Between July 5, 2017 and July 12, 2018, the static water level at Orange Grove Well No. 1A decreased about four feet from elevation of about 374 feet above msl to elevation of about 370 feet above msl. Arcadia produced about 1,783 acre-feet of groundwater from July 1, 2017 to June 30, 2018. The static water level at City of Arcadia Orange Grove Well No. 1A is shown since January 2012 on Plates 5 and 6. In addition, the static water level at Arcadia Orange Grove Well No. 1A compared to recent production is shown on Plate 3B.

Other Wells

In addition to the Sierra Madre wellfield and the Arcadia wellfield, the static water level was measured at Arcadia's Wells Anoakia, Colorado, Hugo Reid, Rancho 6, Chapman 6 and Chapman 7; Kinneloa Irrigation District's Wilcox Well; and the Chelsea Well. On October 9, 2013, Sierra Madre significantly reduced production from its wellfield, and Sierra Madre resumed production on December 16, 2015.

During fiscal year 2017-18, the static water level in the Anoakia and Chapman 7 wells generally followed the same pattern as the City of Sierra Madre's Well No. 3 and City of Arcadia's Well No. 1A. The static water level in the Anoakia Well had a net decrease of 12 feet, while the static water level in the Chapman 7 Well had a net decrease of 5 feet. The City of Arcadia's Chapman Well 7 is located in the Pasadena Subarea and has been inactive since early 2016. The City of Arcadia's Anoakia Well and Orange Grove Well No. 1 A, along with the City of Sierra Madre's Well No. 3 are

located in the Santa Anita Subarea. As shown on Plate 6, the static water level trend in all four wells appears to be similar when Chapman 7 and Anoakia are not in operation, despite Chapman 7 being in the Pasadena Subarea. When Chapman 7 and Anoakia are in operation (as shown on Plate 6 between 2012 and 2013), the static water levels appear to be influenced by both the Pasadena and Santa Anita Subareas.

During fiscal year 2017-18, the static water level has generally been stable at the Hugo Reid Well, Rancho 6 Well, Chapman 6 Well, Chelsea Well and the Wilcox Well I, as shown on Plates 6 and 7. During fiscal year 2017-18, the static water level at Arcadia's Colorado Well has ranged from about 299 feet above msl (July 2017) to about 334 feet above msl (January 2018), as shown on Plate 7, but had a net increase of 4 feet. The measured static water levels are consistent with Arcadia's SCADA results from its well profile at the Colorado Well. Arcadia staff indicated the Colorado Well is operated for about 12 hours and turned off for about 12 hours to allow the groundwater level in the Colorado Well to recover, before measuring the water level. Historically, the Colorado Well requires several days to fully recover.

The static water level at the Sierra Madre and Arcadia wellfields, along with the Anoakia Well and Chapman 7 Well, decreased during fiscal year 2017-18 despite delivery of 1,340 acre-feet of MWD treated imported water into the Sierra Madre Spreading Grounds. This implies groundwater production exceeded the impacts of combined natural (local) and MWD treated imported water replenishment, although groundwater production was compliant with the "500-foot Rule". The static water level in the other monitoring well were relatively stable, while the static water level in the Colorado Well increased.

SUMMARY

The City of Sierra Madre continued its Pilot Program Replenishment deliveries during fiscal year 2017-18. At the conclusion of each year Sierra Madre will organize the data collected (including data provided by SMAART and Arcadia) into a

Program report on the results of the Pilot Program, including, but not limited to static water levels, groundwater production and groundwater quality. At its July 18, 2018 meeting, the RBMB Board directed staff to prepare a Technical Memorandum summarizing the City of Sierra Madre's Pilot Program Replenishment Deliveries for Fiscal Year 2017-18. The findings are summarized as follows.

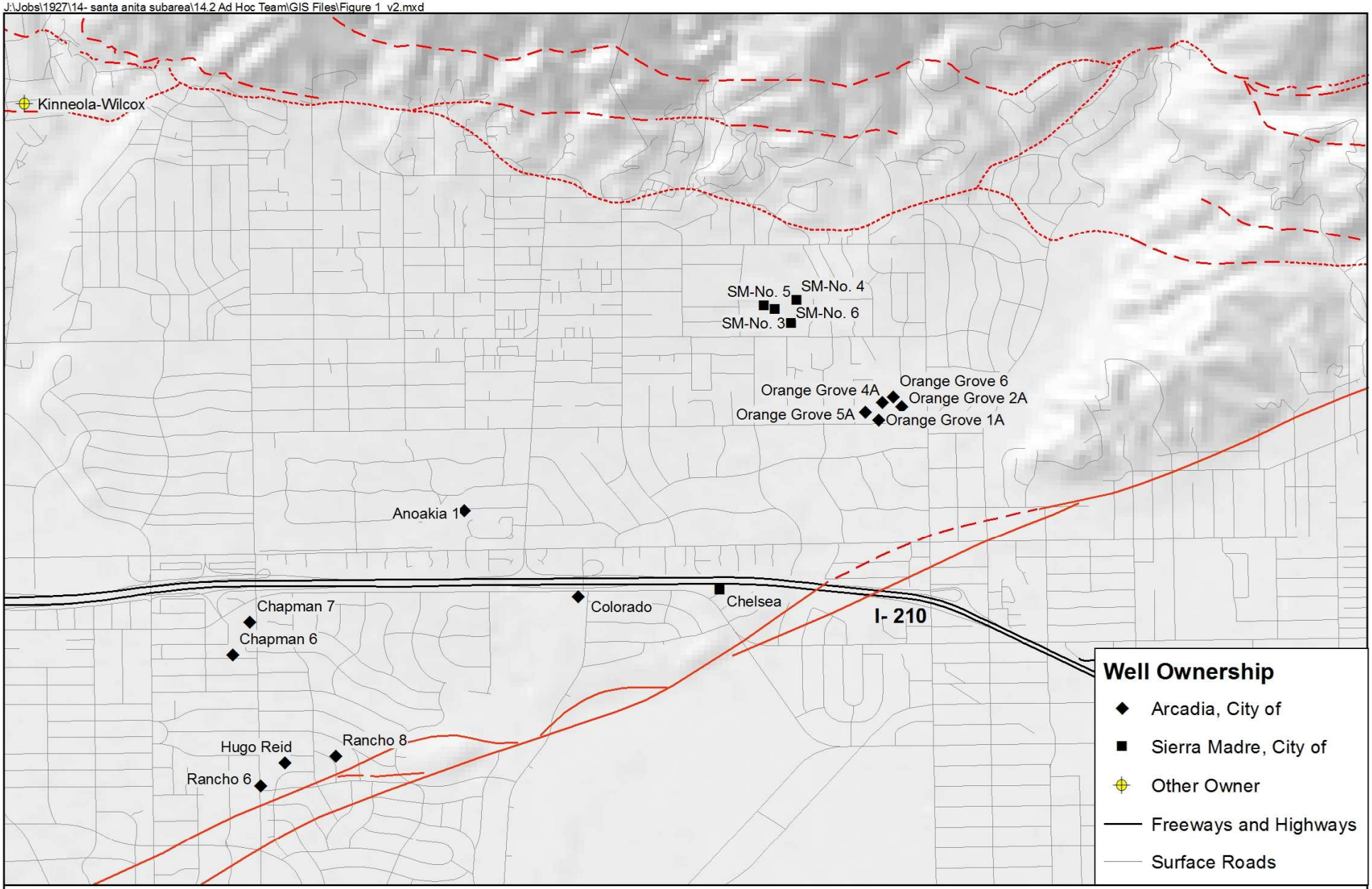
- MWD treated imported water was a blend of SWP water and Colorado River water while replenishment deliveries occurred through the Summer and Fall of 2017. Consequently, groundwater quality improved at the Sierra Madre wellfield, as shown on Figures 2 and 4. MWD switched to 100 percent Colorado River water in the Spring of 2018 groundwater quality at the Sierra Madre wellfield began to exhibit an increase in concentrations, as shown on Figures 2 and 4.The "lag time" between commencement of replenishment and water quality impacts at the Sierra Madre wellfield is about two months.
- Following about 16 months from the initial MWD treated imported water deliveries in December 2015, TDS concentrations at the Arcadia wellfield exhibited an increase. TDS concentrations subsequently returned to around ambient water quality when spreading was discontinued.
- Both the City of Sierra Madre and the City of Arcadia complied with the "500-foot Rule" provisions of the Raymond Basin Judgment.
- Although the City of Sierra Madre spread 1,340 acre-feet of MWD treated imported water, the groundwater level had a net decrease during fiscal year 2017-18. This indicates groundwater production during the year exceed the combined effects of local and MWD treated imported water replenishment.

CONCLUSIONS

The City of Sierra Madre continued its Pilot Program Replenishment deliveries during fiscal year 2017-18. Following review of data, the following conclusions are made:

- The City of Sierra Madre's Pilot Program Replenishment deliveries are having a beneficial impact by enabling the Cities of Sierra Madre and Arcadia to continue to produce from the Santa Anita Subarea.
- The replenishment water quality during fiscal year 2017-18 was generally similar to the ambient groundwater quality and there were minimal groundwater quality variations.
- Groundwater production by both the City of Sierra Madre and the City of Arcadia complied with the "500-foot Rule" from the Raymond Basin Judgment.
- The net groundwater levels in the City of Sierra Madre and City of Arcadia wellfields decreased indicating local stormwater replenishment was not sufficient to sustain groundwater levels. Additional imported water replenishment appears to be needed to stabilize groundwater levels and help the subarea to recover.
- The replenishment water deliveries appear to impact the Sierra Madre wellfield about two months following initiation of deliveries based upon water levels and water quality. The City of Arcadia wellfield also appears to be impacted based upon water quality and replenishment appears to have about a 16-month lag.

J:\Jobs\1927\14- santa anita subarea\14.2 Ad Hoc Team\GIS Files\Figure 1 v2.mxd



STETSON ENGINEERS INC.

WELLS IN EASTERN RAYMOND BASIN STUDY AREA FOR GROUNDWATER MONITORING PROGRAM

FIGURE 1

CITY OF SIERRA MADRE GROUNDWATER REPLENISHMENT PROGRAM
HISTORICAL TDS CONCENTRATIONS

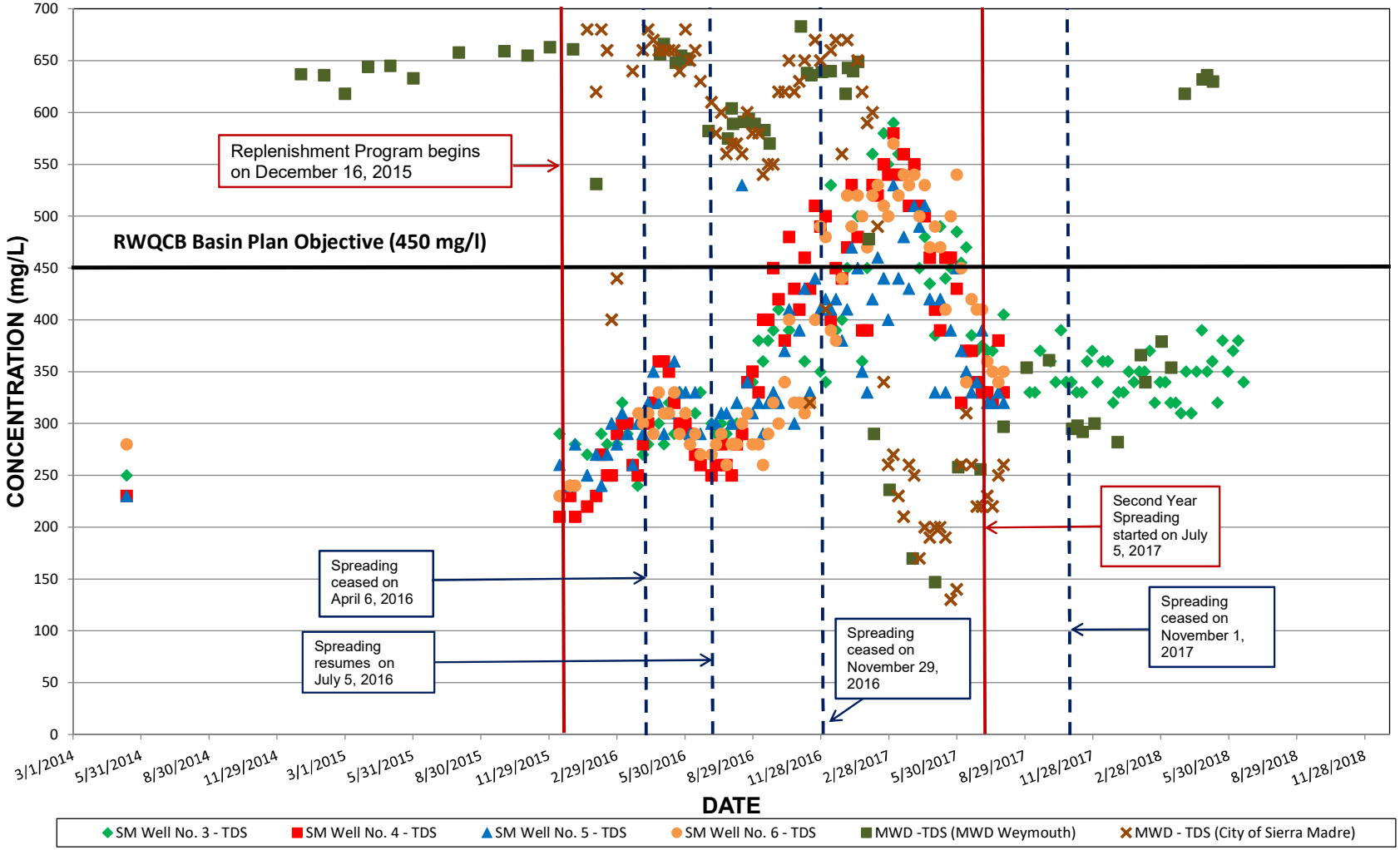


FIGURE 2

CITY OF SIERRA MADRE GROUNDWATER REPLENISHMENT PROGRAM
HISTORICAL TDS CONCENTRATIONS

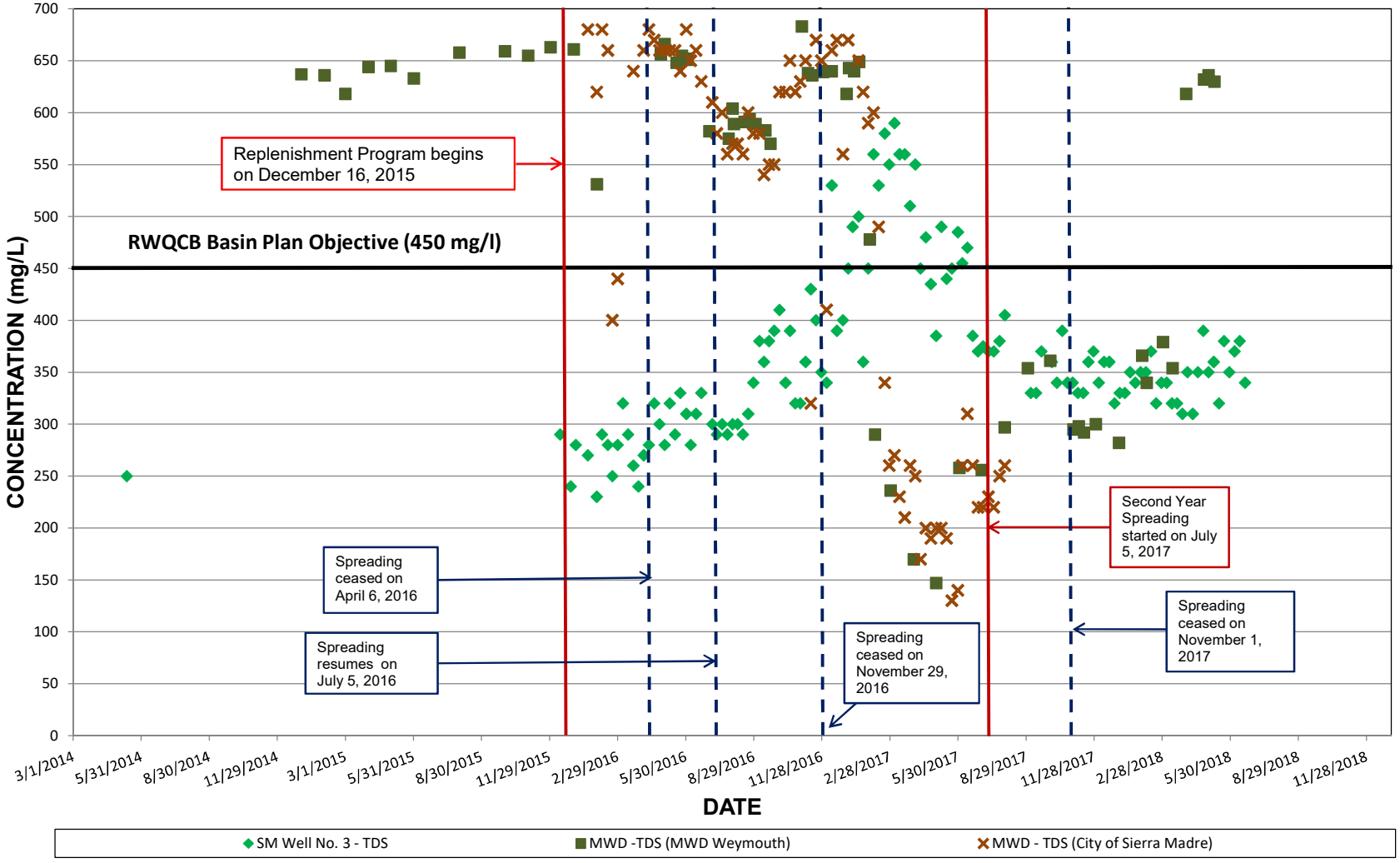


FIGURE 2A

CITY OF SIERRA MADRE GROUNDWATER REPLENISHMENT PROGRAM
HISTORICAL TDS CONCENTRATIONS

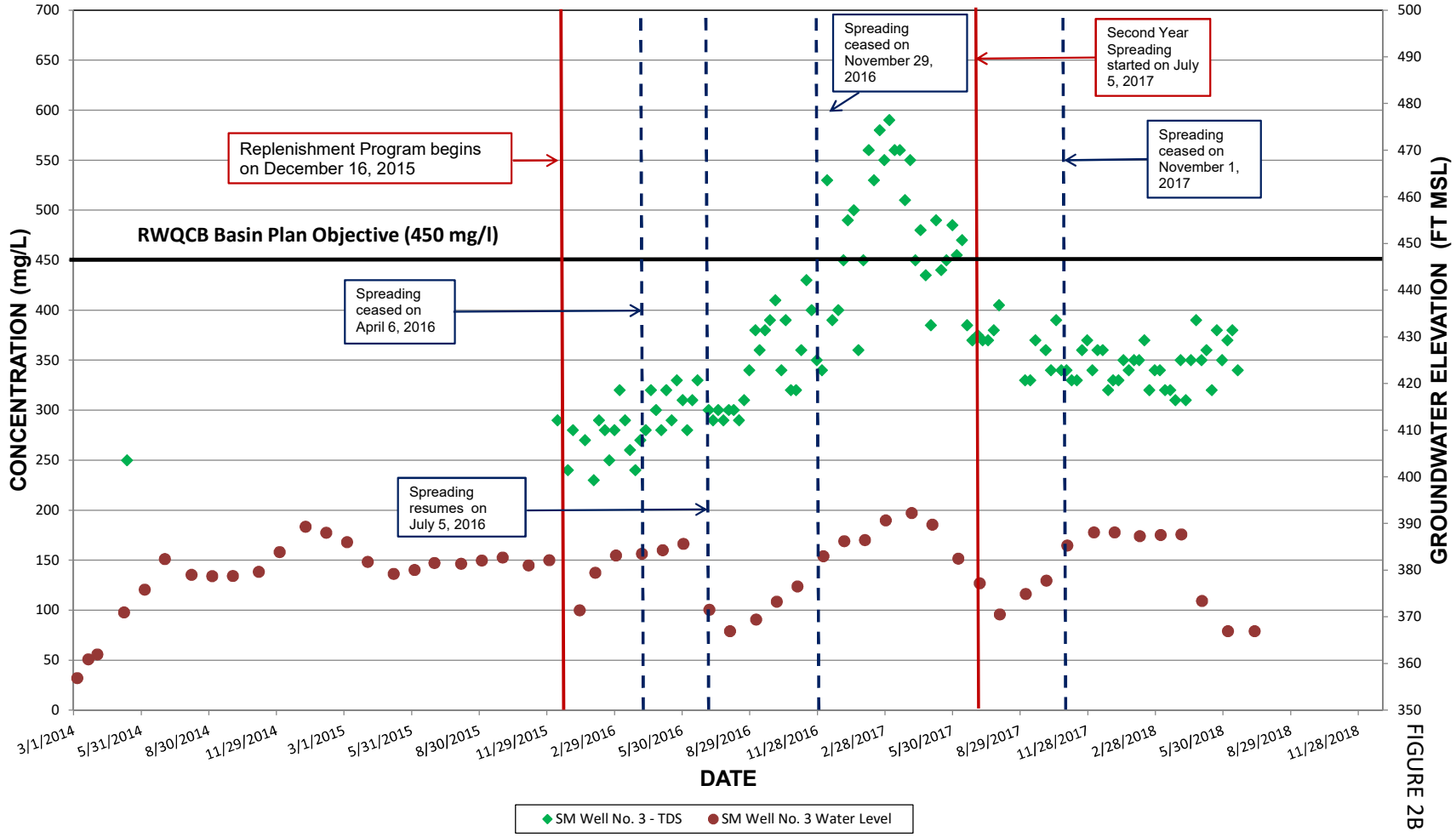


FIGURE 2B

CITY OF SIERRA MADRE GROUNDWATER REPLENISHMENT PROGRAM
HISTORICAL TDS CONCENTRATIONS

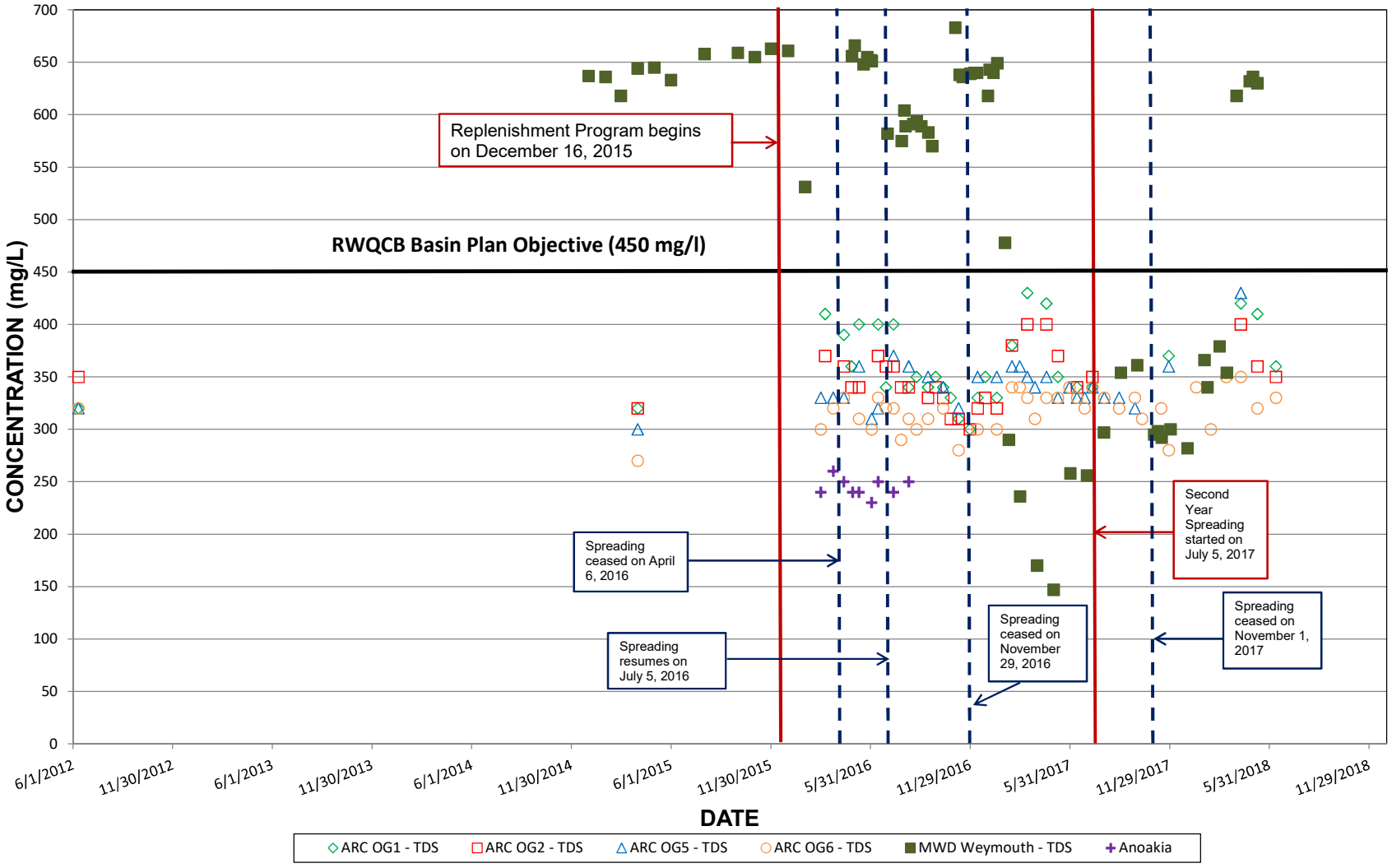


FIGURE 3

CITY OF SIERRA MADRE GROUNDWATER REPLENISHMENT PROGRAM
HISTORICAL SULFATE CONCENTRATIONS

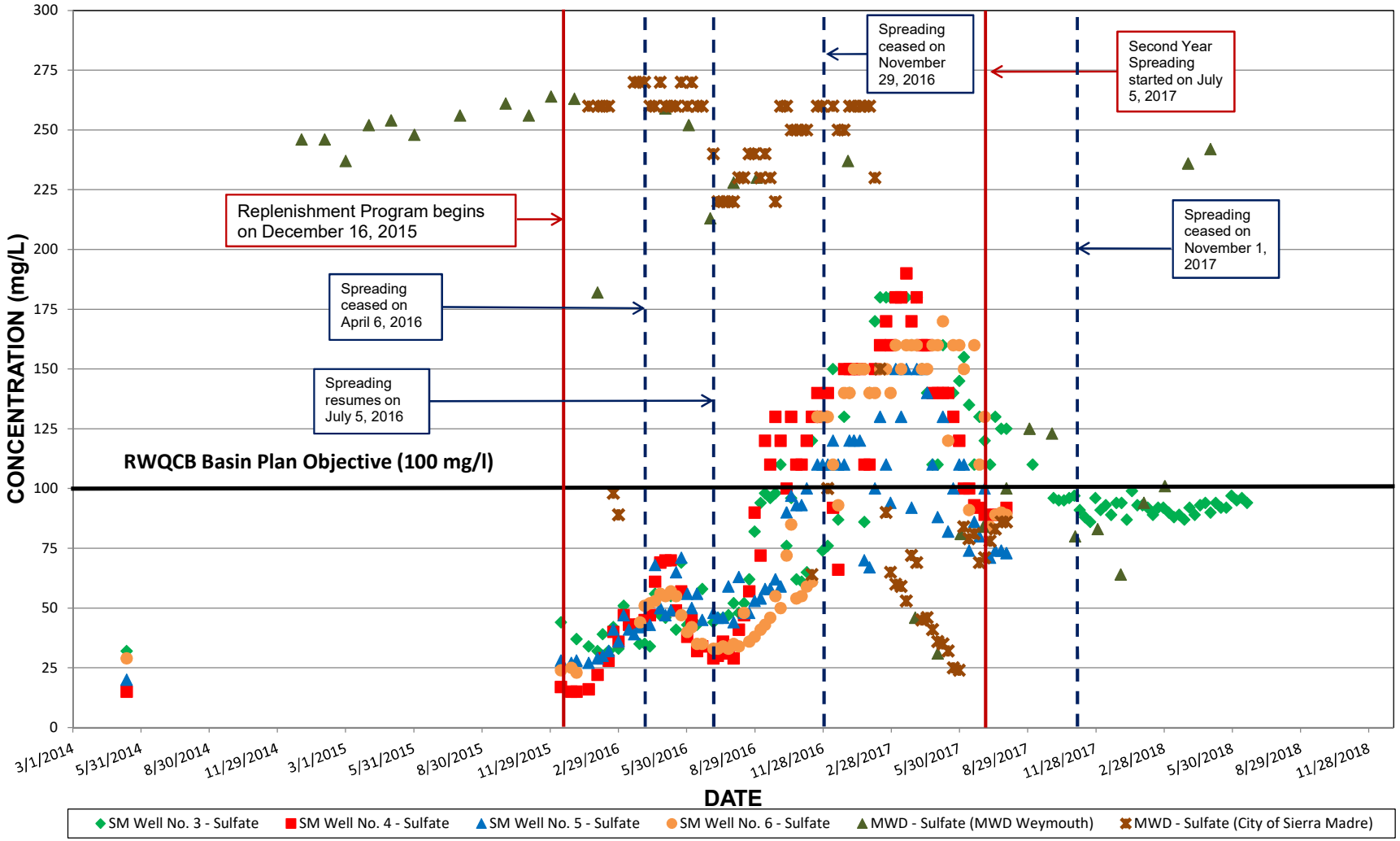


FIGURE 4

CITY OF SIERRA MADRE GROUNDWATER REPLENISHMENT PROGRAM
HISTORICAL SULFATE CONCENTRATIONS

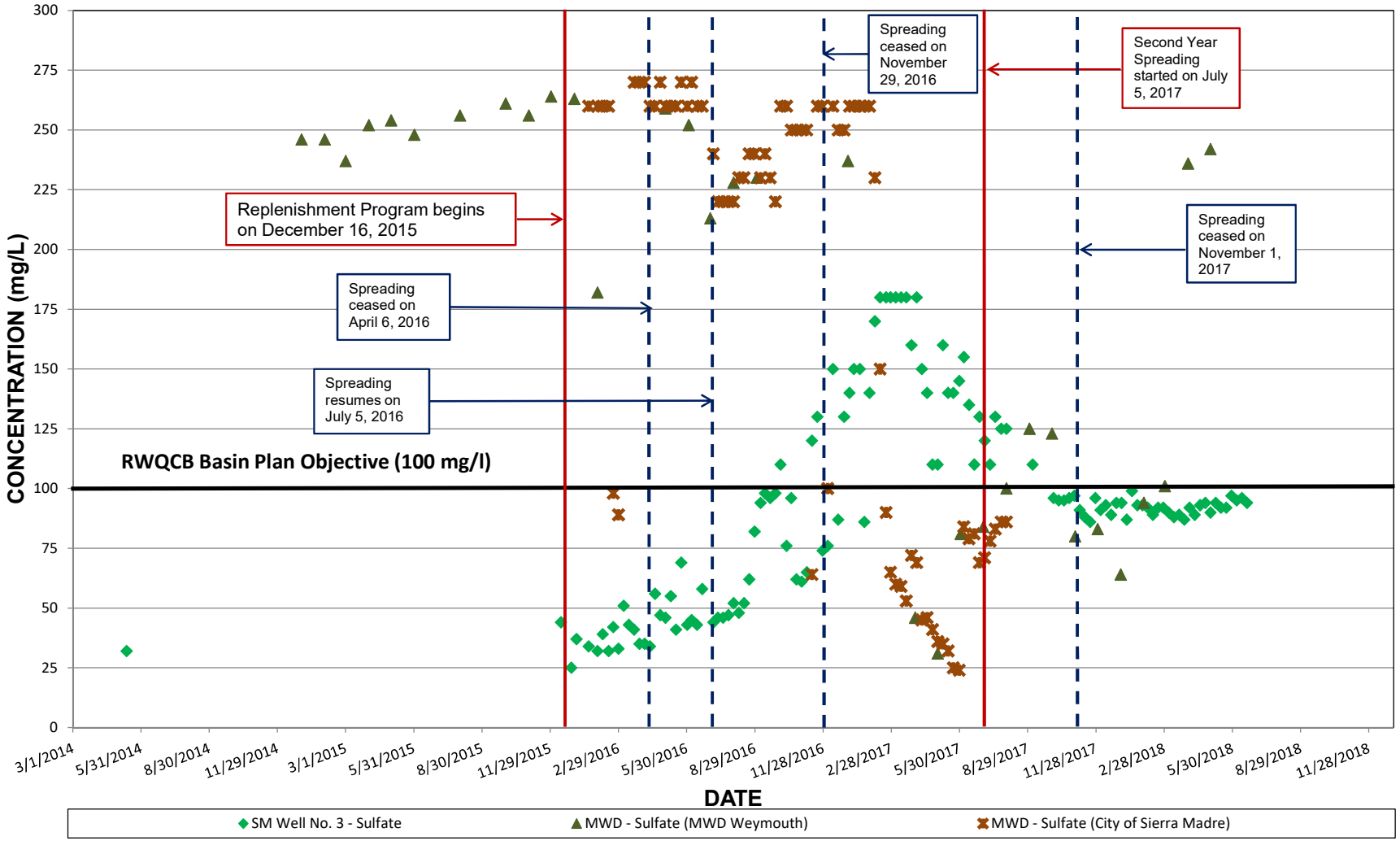


FIGURE 4A

CITY OF SIERRA MADRE GROUNDWATER REPLENISHMENT PROGRAM
HISTORICAL SULFATE CONCENTRATIONS

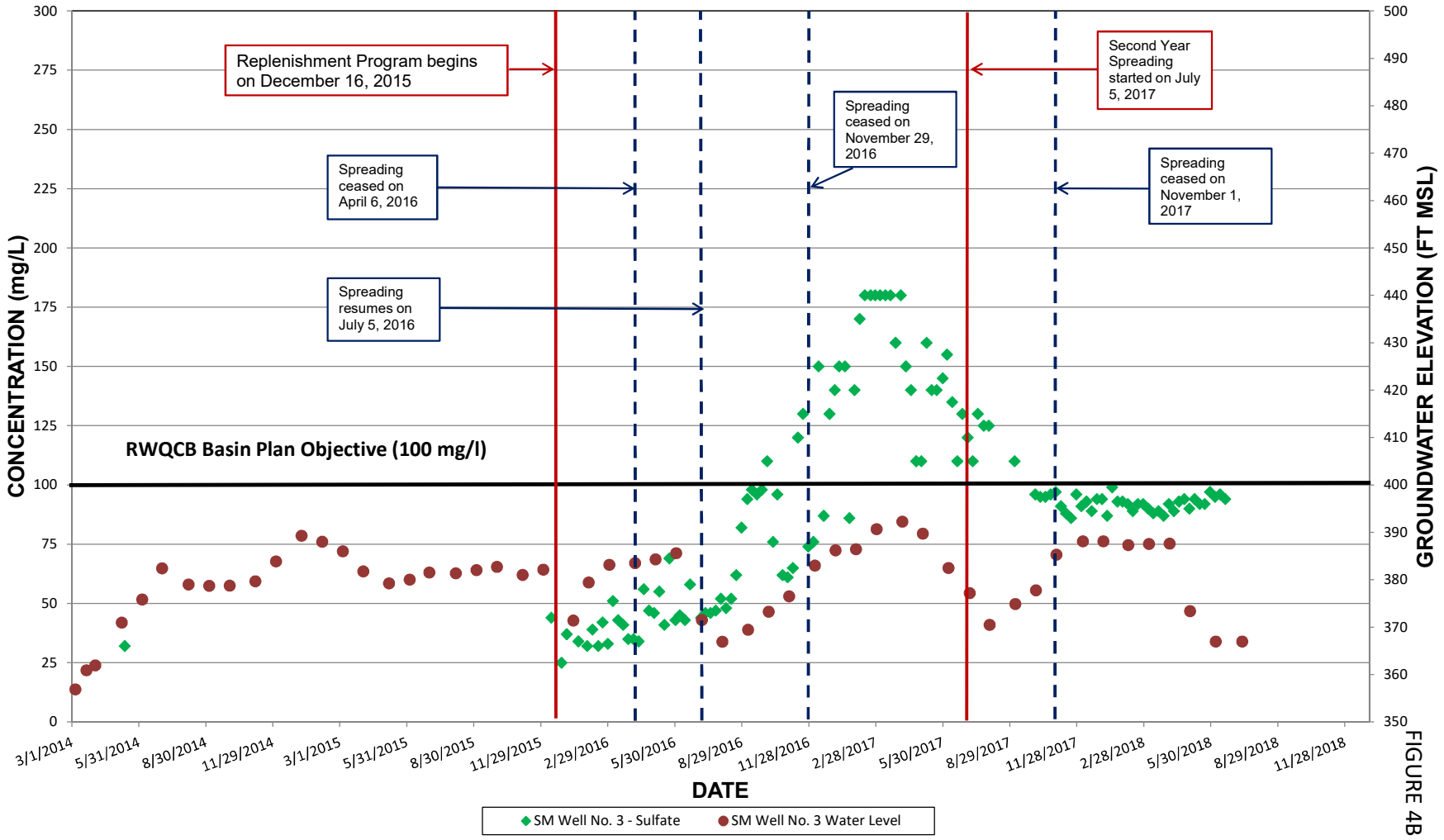


FIGURE 4B

CITY OF SIERRA MADRE GROUNDWATER REPLENISHMENT PROGRAM
HISTORICAL SULFATE CONCENTRATIONS

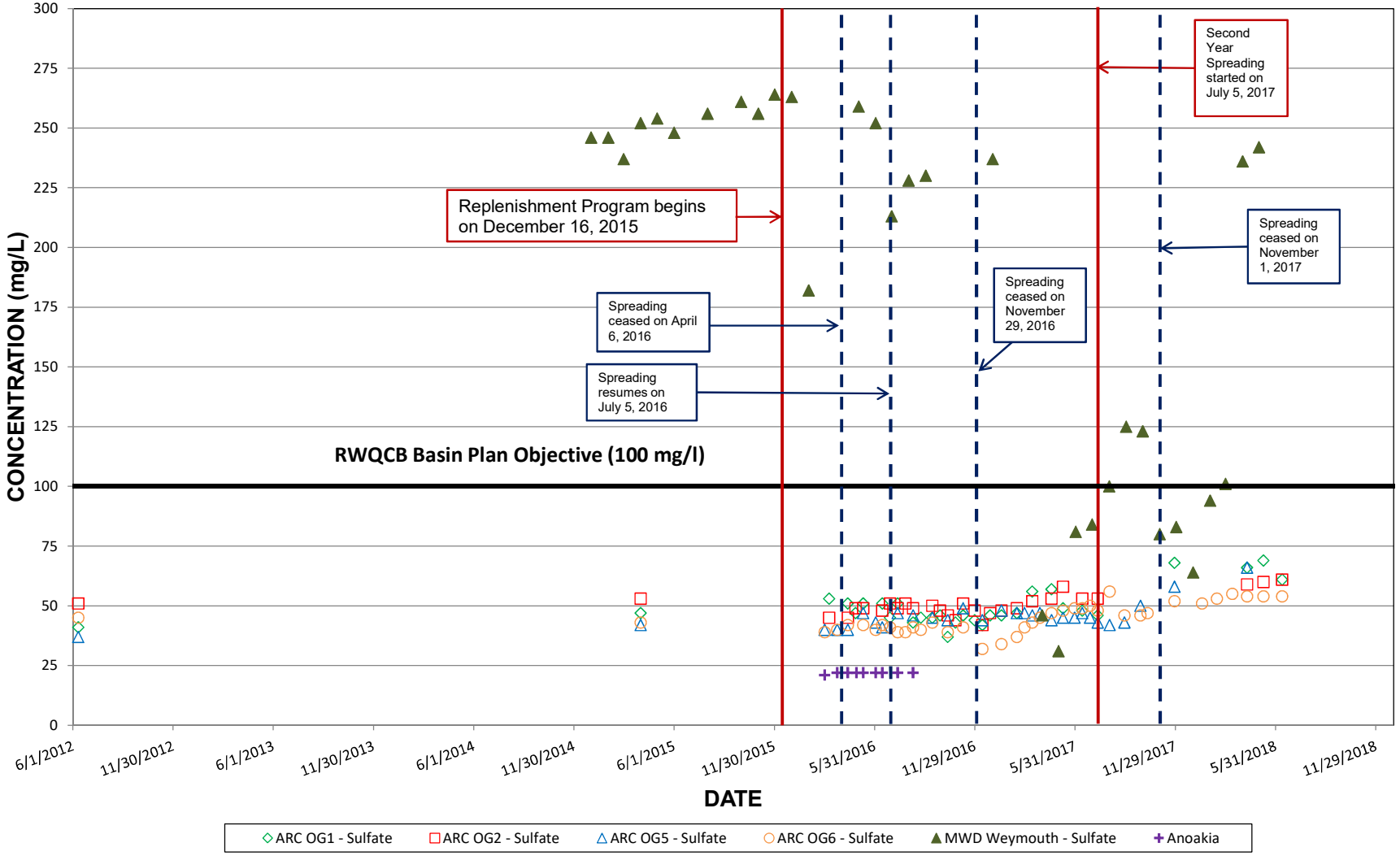


FIGURE 5

STETSON ENGINEERS INC.
West Covina San Rafael Mesa, Arizona
WATER RESOURCE ENGINEERS

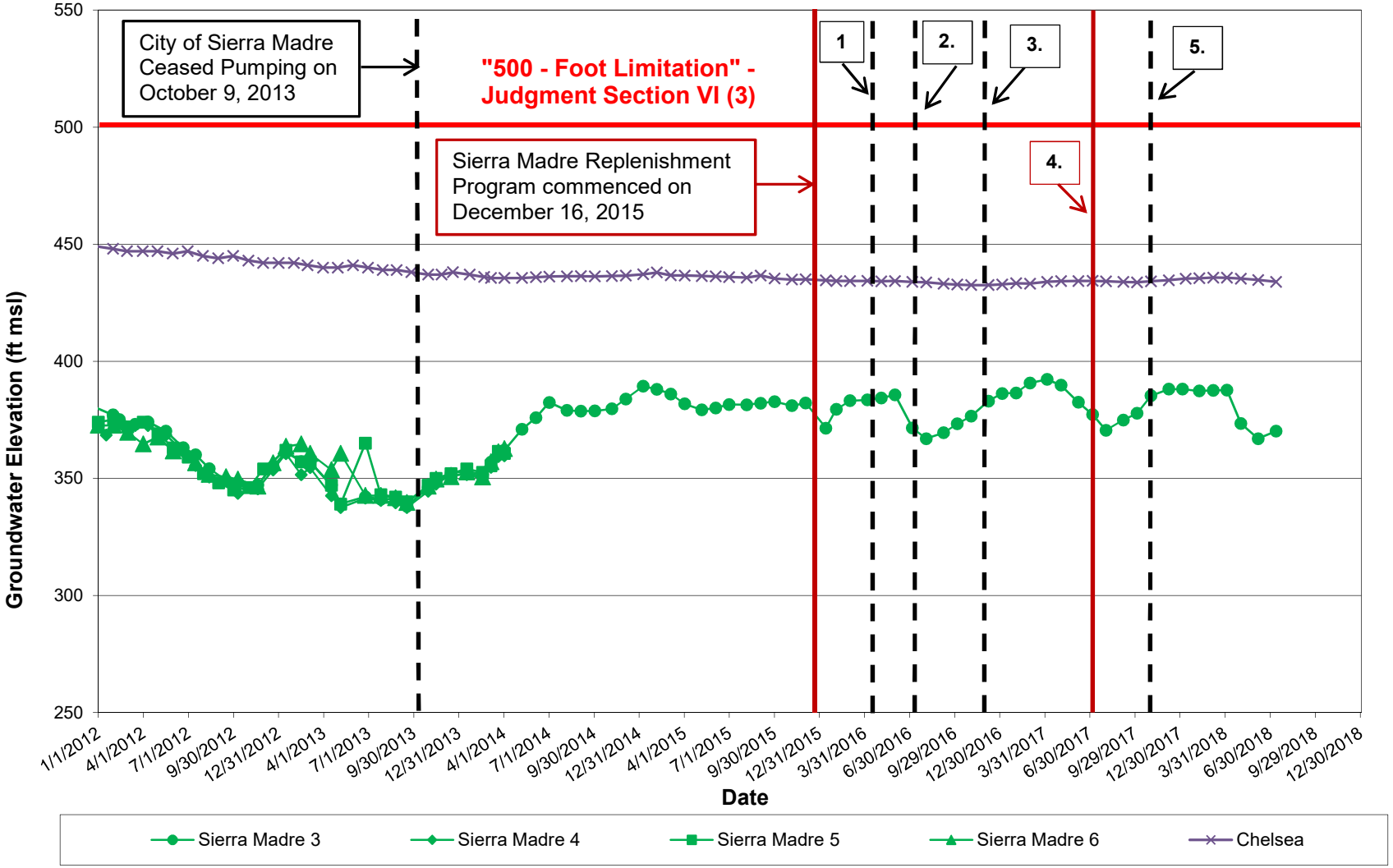
CITY OF SIERRA MADRE REPLENISHMENT PROGRAM

LOCATION MAP - CITY OF SIERRA MADRE WELLS

PLATE 1

3/15/2016

SMAART
Groundwater Elevation Monitoring Program
Comparison of Groundwater Elevations
City of Sierra Madre Wells



1. Spreading ceased on April 6, 2016
2. Replenishment Program resumed on July 5, 2016
3. Replenishment Program ceased on November 29, 2016
4. Second Year Spreading started on July 5, 2017.
5. Spreading ceased on November 1, 2017.

PLATE 2

CITY OF SIERRA MADRE GROUNDWATER REPLENISHMENT PROGRAM
STATIC GROUNDWATER ELEVATION COMPARED TO PRODUCTION

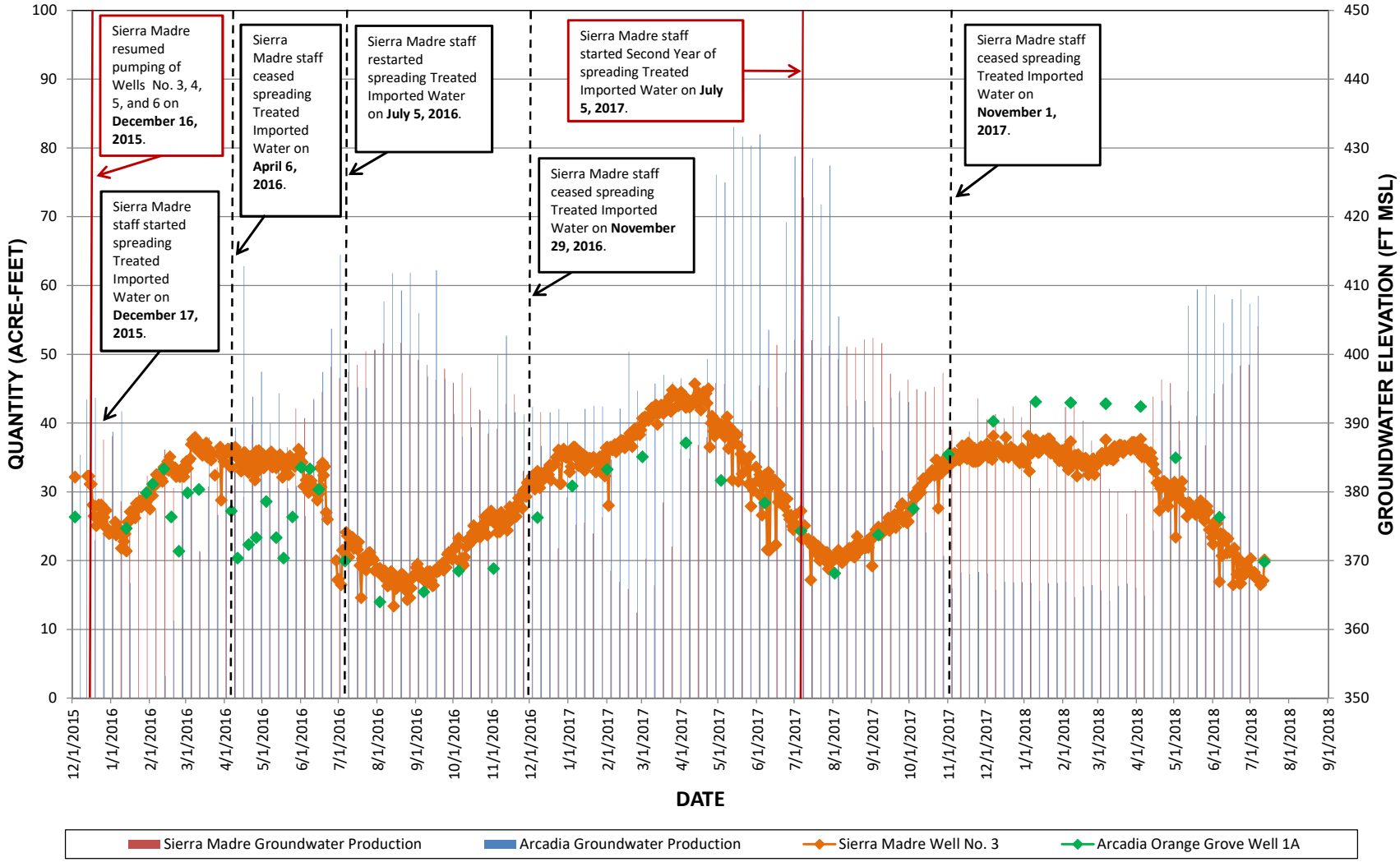


PLATE 3

CITY OF SIERRA MADRE GROUNDWATER REPLENISHMENT PROGRAM
STATIC GROUNDWATER ELEVATION COMPARED TO PRODUCTION

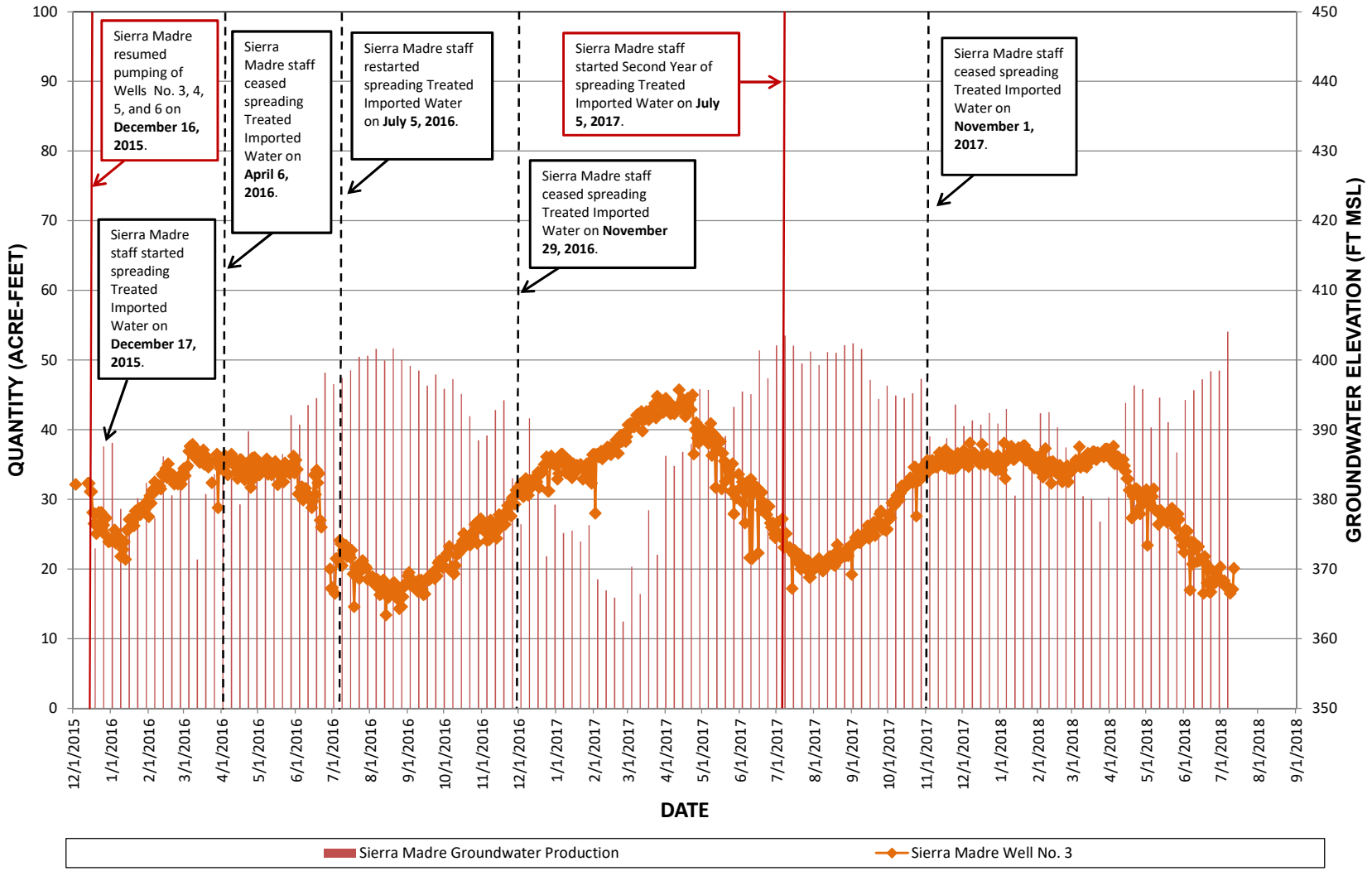


PLATE 3A

CITY OF SIERRA MADRE GROUNDWATER REPLENISHMENT PROGRAM
STATIC GROUNDWATER ELEVATION COMPARED TO PRODUCTION

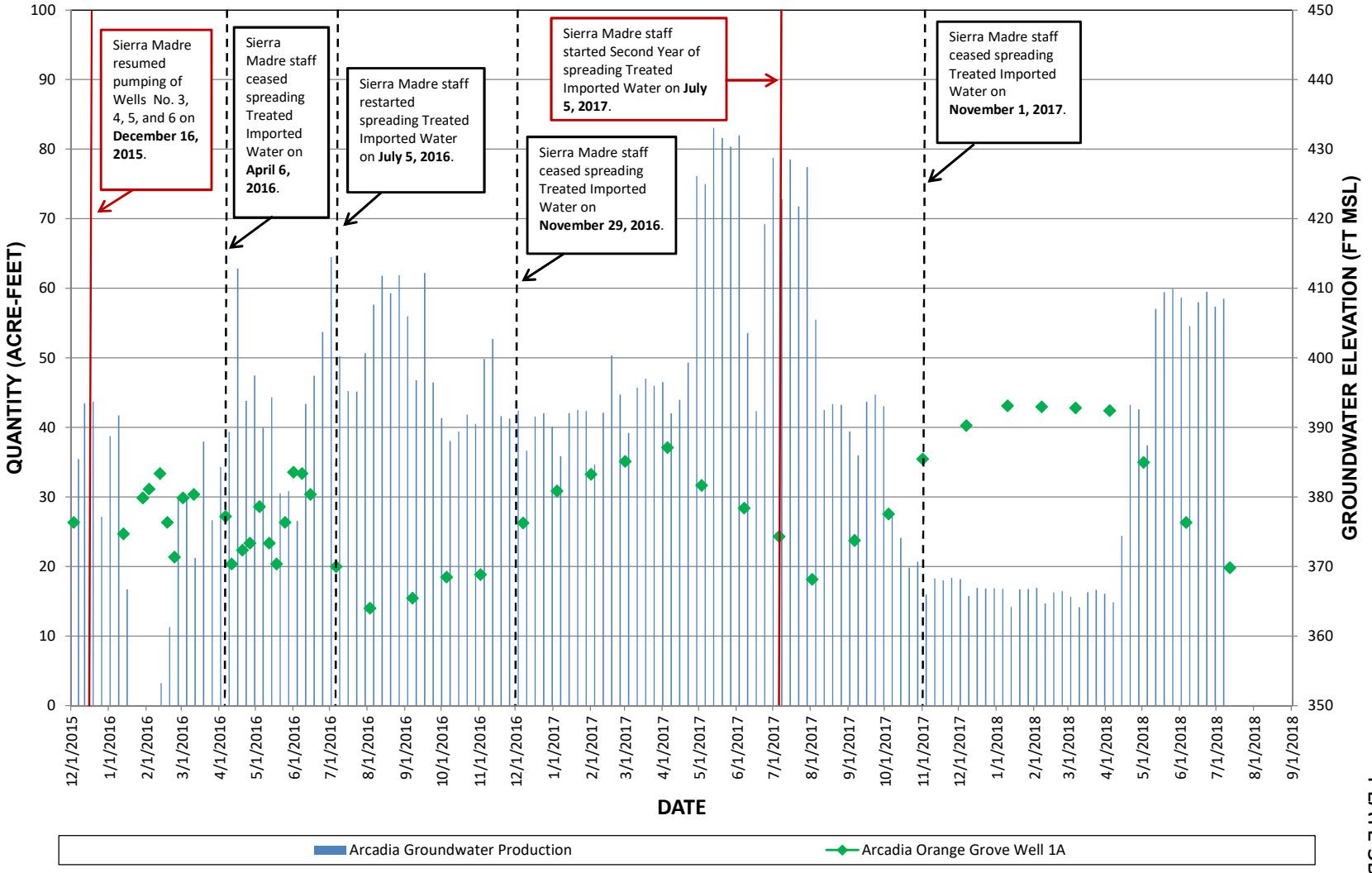
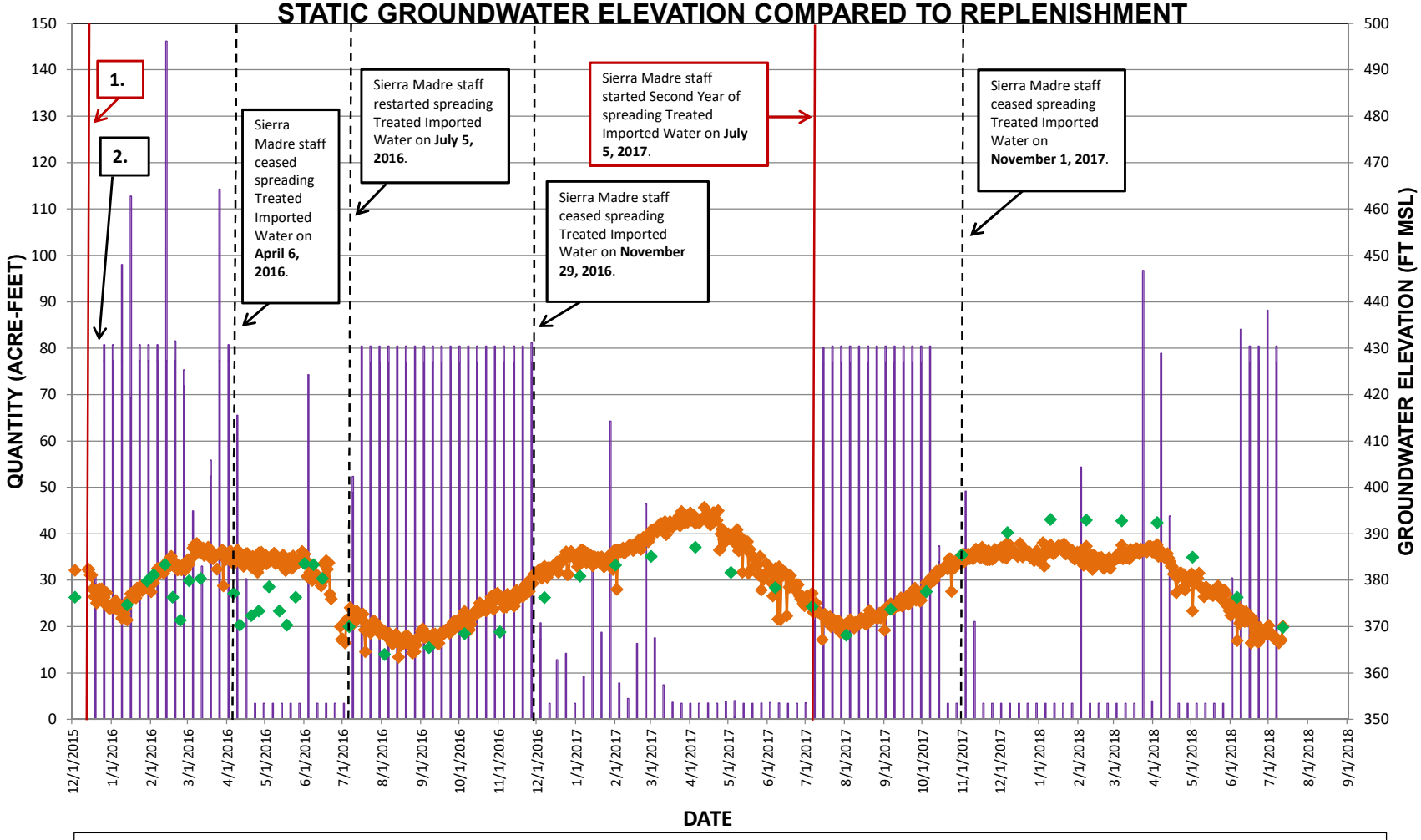


PLATE 3B

CITY OF SIERRA MADRE GROUNDWATER REPLENISHMENT PROGRAM
STATIC GROUNDWATER ELEVATION COMPARED TO REPLENISHMENT



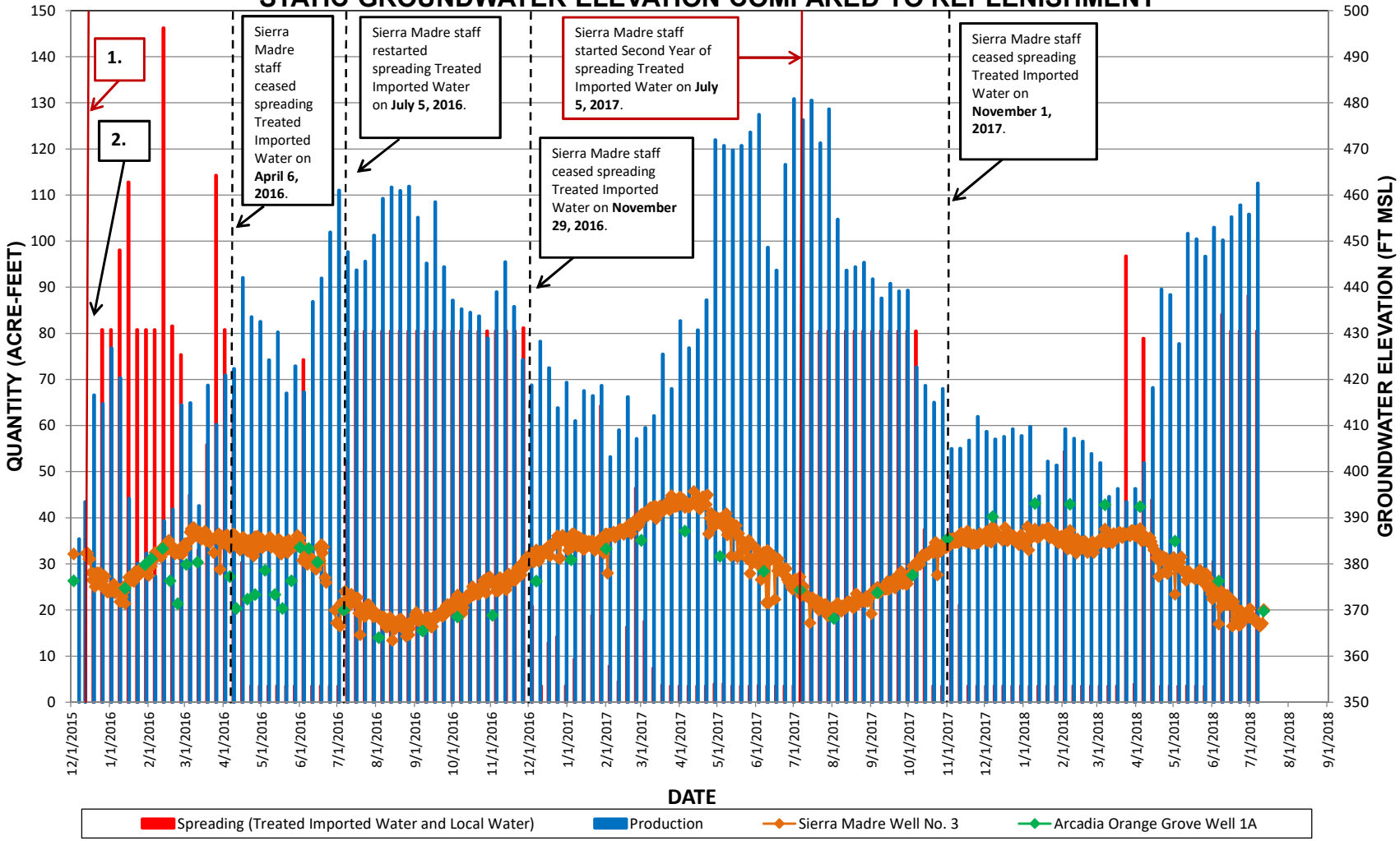
NOTES :

1) Sierra Madre resumed pumping of Wells No. 3, 4, 5, and 6 on December 16, 2015.

2) Sierra Madre staff started spreading Treated Imported Water on December 17, 2015.

PLATE 4A

CITY OF SIERRA MADRE GROUNDWATER REPLENISHMENT PROGRAM
STATIC GROUNDWATER ELEVATION COMPARED TO REPLENISHMENT



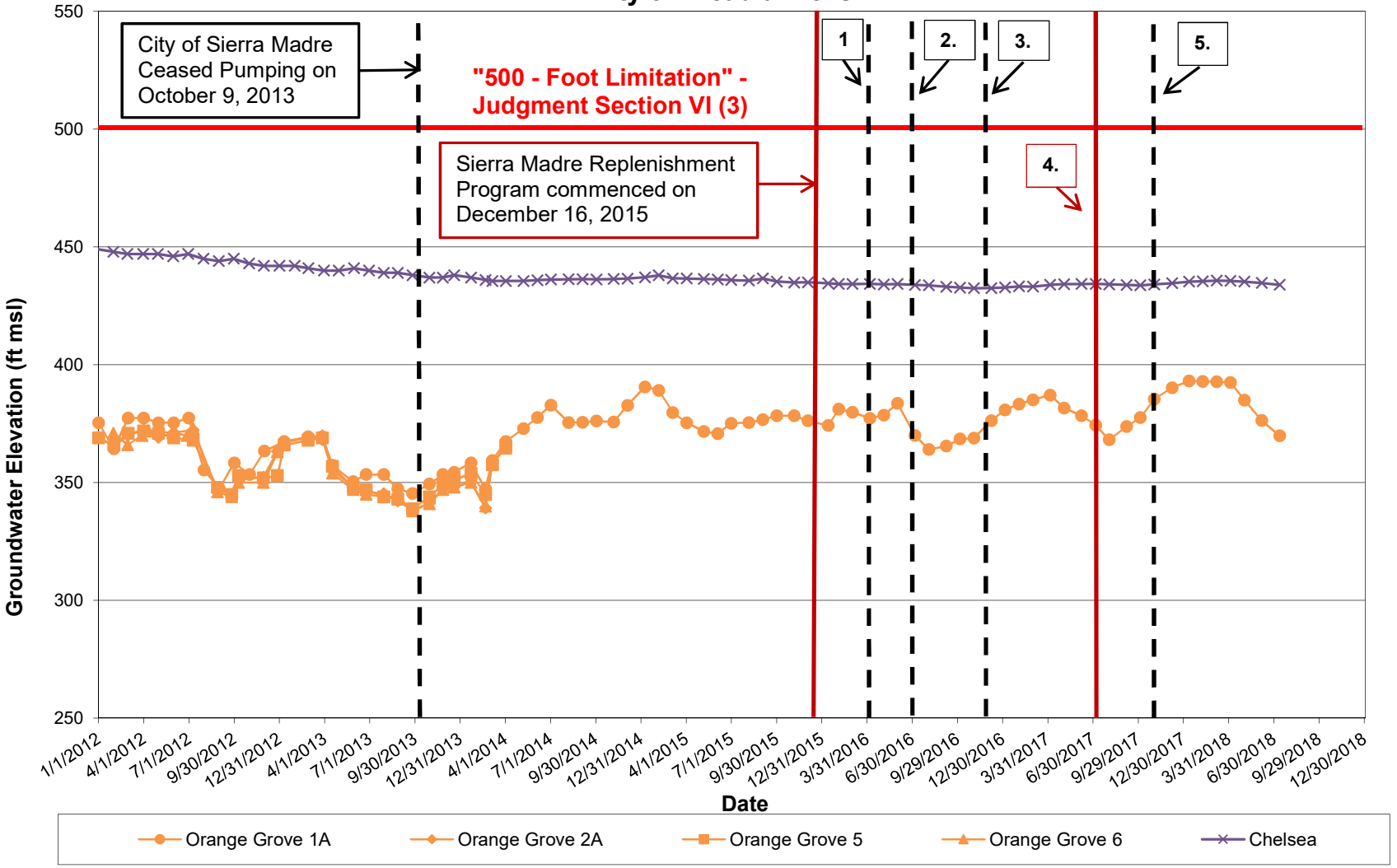
NOTES :

1) Sierra Madre resumed pumping of Wells No. 3, 4, 5, and 6 on December 16, 2015.

2) Sierra Madre staff started spreading Treated Imported Water on December 17, 2015.

PLATE 4B

SMAART
Groundwater Elevation Monitoring Program
Comparison of Groundwater Elevations
City of Arcadia Wells



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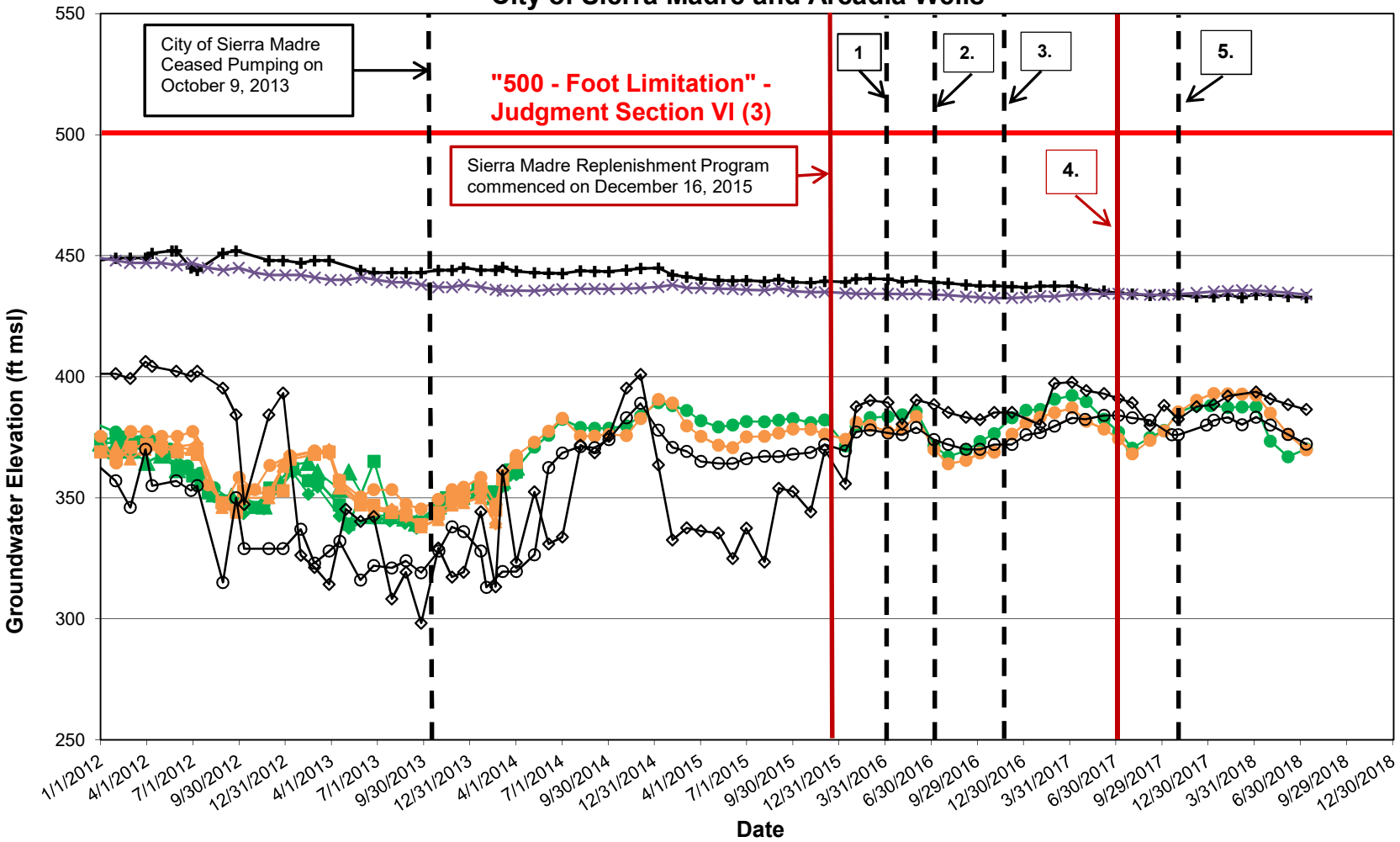
5. Spreading ceased on November 1, 2017.

PLATE 5

SMAART
Groundwater Elevation Monitoring Program
Comparison of Groundwater Elevations
City of Sierra Madre and Arcadia Wells



Sierra Madre 3 | Sierra Madre 4 | Sierra Madre 5 | Sierra Madre 6 | Orange Grove 1A | Orange Grove 2A
Orange Grove 5 | Orange Grove 6 | Anoakia 1 | Chapman 6 | Chapman 7 | Chelsea

1. Spreading ceased on April 6, 2016
2. Replenishment Program resumed on July 5, 2016
3. Replenishment Program ceased on November 29, 2016
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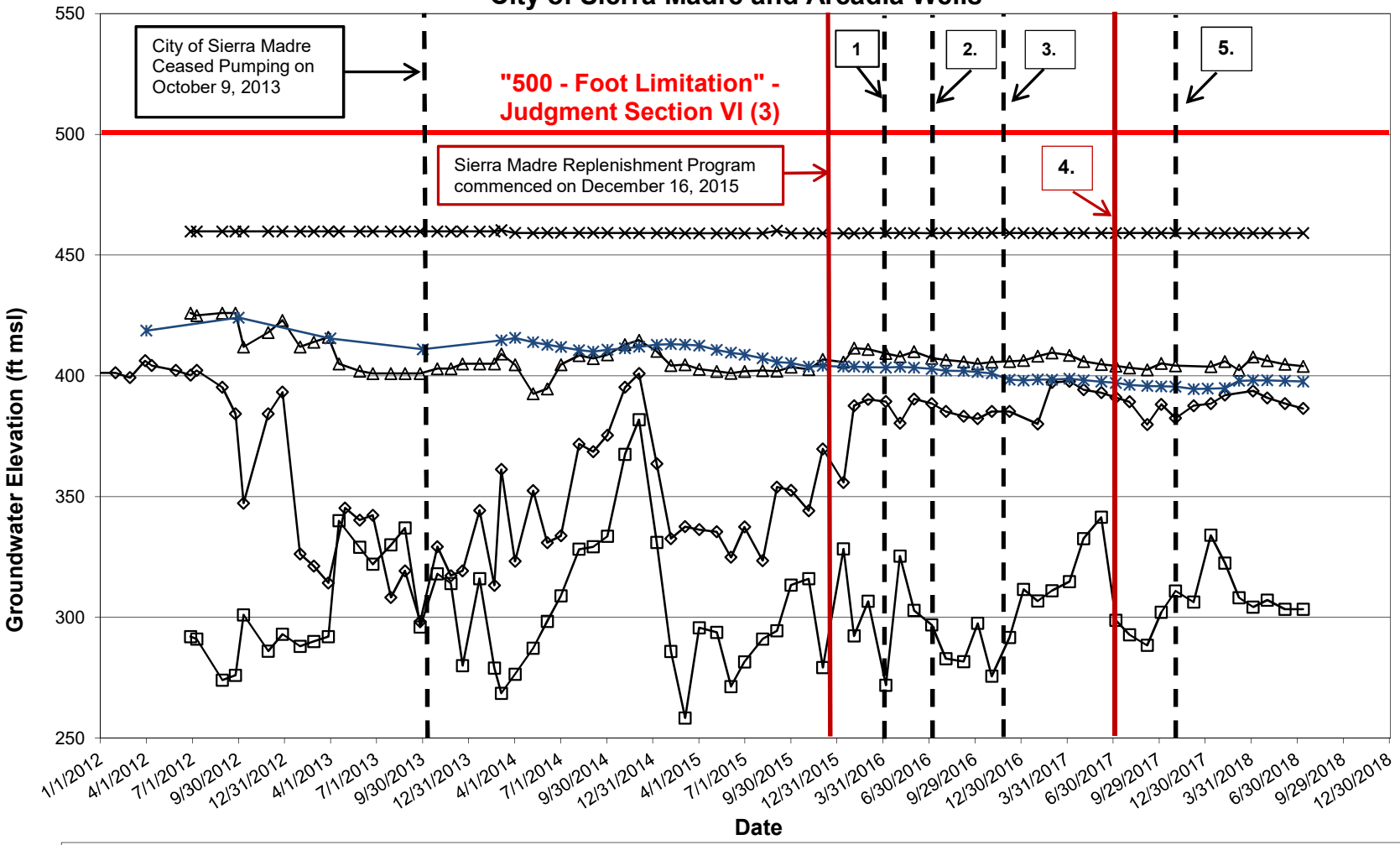
5. Spreading ceased on November 1, 2017.

PLATE 6

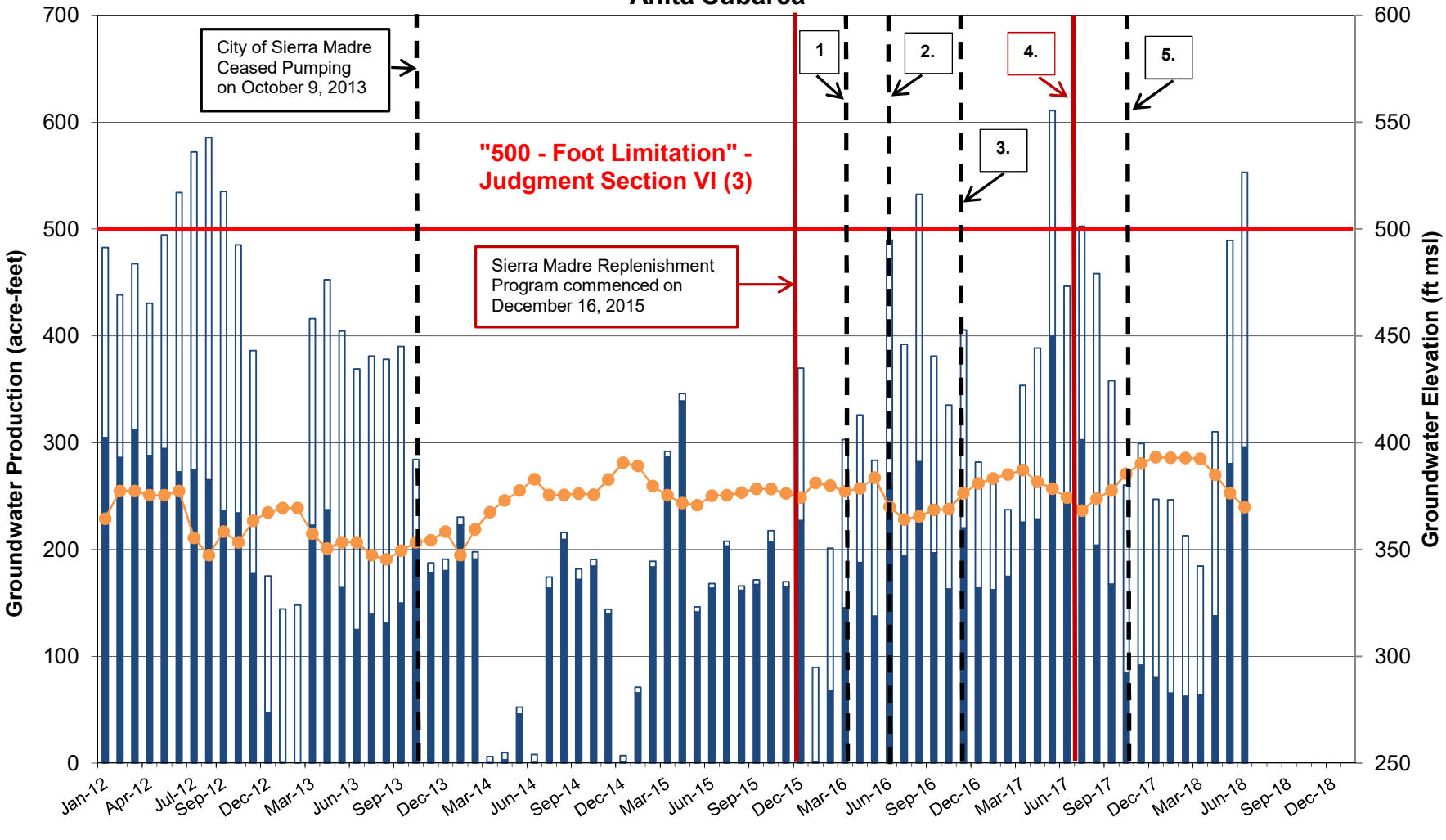
SMAART
Groundwater Elevation Monitoring Program
Comparison of Groundwater Elevations
City of Sierra Madre and Arcadia Wells



1. Spreading ceased on April 6, 2016
2. Replenishment Program resumed on July 5, 2016
3. Replenishment Program ceased on November 29, 2016
4. Second Year Spreading started on July 5, 2017.
5. Spreading ceased on November 1, 2017.

PLATE 7

SMAART
Groundwater Elevation Monitoring Program
Comparison of Groundwater Elevation at Arcadia Orange Grove Well No. 1A and Groundwater Production in the Santa Anita Subarea



1. Spreading ceased on April 6, 2016
2. Replenishment Program resumed on July 5, 2016
3. Replenishment Program ceased on November 29, 2016
4. Second Year Spreading started on July 5, 2017
5. Spreading ceased on November 1, 2017

PLATE 8

TABLE 1

Arcadia and Sierra Madre Monthly Production

Well	Date	Meter Reading (CF)	Production (AF)
SANTA ANITA SUBAREA			
City of Arcadia			
Orange Grove 1A			
	7/30/2013	356,928,200	
	8/27/2013	356,928,200	0.0
	9/26/2013	357,925,600	22.9
	10/30/2013	361,575,900	83.8
	11/26/2013	364,851,000	75.2
	12/19/2013	368,193,400	76.7
	1/22/2014	371,241,200	70.0
	2/20/2014	373,431,800	50.3
		SUBTOTAL	378.9
	3/6/2014	373,441,400	0.2
	4/2/2014	373,441,400	0.0
	5/8/2014	373,537,200	2.2
	6/5/2014	373,968,800	9.9
	7/2/2014	373,972,900	0.1
		SUBTOTAL	12.4
	8/7/2014	375,804,300	42.0
	9/4/2014	378,821,300	69.3
	10/2/2014	381,832,000	69.1
	11/6/2014	385,694,400	88.7
	12/4/2014	388,407,700	62.3
	1/8/2015	388,418,600	0.3
	2/5/2015	389,498,600	24.8
	3/5/2015	392,788,400	75.5
	4/2/2015	395,755,400	68.1
	5/7/2015	398,386,900	60.4
	6/4/2015	399,517,900	26.0
	7/1/2015	402,536,800	69.3
		SUBTOTAL	655.7
	8/6/2015	406,635,200	94.1
	9/3/2015	409,776,500	72.1
	10/1/2015	412,783,100	69.0
	11/5/2015	416,622,400	88.1
	12/3/2015	419,697,300	70.6
INITIAL YEAR PILOT PROGRAM REPLENISHMENT STARTED ON 12/16/2015	1/13/2016	419,727,000	0.7
	2/3/2016	419,743,900	0.4
	3/2/2016	419,770,600	0.6
	4/6/2016	419,867,900	2.2
	5/4/2016	421,588,700	39.5
	6/1/2016	421,608,500	0.5
	7/6/2016	423,492,700	43.3

TABLE 1

Arcadia and Sierra Madre Monthly Production

Well	Date	Meter Reading (CF)	Production (AF)
		SUBTOTAL	481.1
	8/3/2016	424,281,400	18.1
	9/7/2016	428,132,900	88.4
	10/5/2016	431,185,700	70.1
	11/2/2016	434,048,600	65.7
	12/7/2016	437,998,900	90.7
	1/4/2017	441,168,800	72.8
	2/1/2017	444,394,600	74.1
	3/1/2017	445,974,900	36.3
	4/5/2017	446,004,500	0.7
	5/3/2017	447,018,800	23.3
	6/7/2017	450,984,400	91.0
SECOND YEAR PILOT PROGRAM REPLENISHMENT STARTED ON 07/05/2017	7/6/2017	454,137,300	72.4
		SUBTOTAL	703.5
	8/2/2017	456,943,000	64.4
	9/6/2017	456,943,000	0.0
	10/4/2017	456,943,000	0.0
	11/1/2017	456,943,000	0.0
	12/7/2017	456,943,000	0.0
	1/10/2018	456,943,000	0.0
	2/7/2018	456,943,000	0.0
	3/7/2018	456,943,000	0.0
	4/4/2018	456,943,000	0.0
	5/2/2018	456,958,300	0.4
	6/6/2018	460,295,600	76.6
	7/12/2018	464,249,500	90.8
		SUBTOTAL	232.1
		TOTAL	**2,463.8**
Orange Grove 2A	7/30/2013	377,594,100	
	8/27/2013	377,594,100	0.0
	9/26/2013	377,598,900	0.1
	10/30/2013	377,598,900	0.0
	11/26/2013	377,598,900	0.0
	12/19/2013	377,598,900	0.0
	1/22/2014	379,999,300	55.1
	2/20/2014	382,895,100	66.5
		SUBTOTAL	121.7
	3/6/2014	382,918,100	0.5
	4/2/2014	--	--
	6/5/2014	383,612,600	16.5
	7/2/2014	383,618,500	0.1

TABLE 1

Arcadia and Sierra Madre Monthly Production

Well	Date	Meter Reading (CF)	Production (AF)
		SUBTOTAL	17.1
	8/7/2014	386,137,000	57.8
	9/4/2014	389,762,800	83.2
	10/2/2014	393,952,700	96.2
	11/6/2014	394,641,000	15.8
	12/4/2014	396,209,700	36.0
	1/8/2015	396,226,700	0.4
	2/5/2015	397,217,200	22.7
	3/5/2015	401,700,100	102.9
	4/2/2015	405,692,100	91.6
	5/7/2015	410,720,900	115.4
	6/4/2015	411,334,200	14.1
	7/1/2015	411,334,200	0.0
		SUBTOTAL	636.3
	8/6/2015	411,334,200	0.0
	9/3/2015	412,529,000	27.4
	10/1/2015	416,699,500	95.7
	11/5/2015	421,833,300	117.9
	12/3/2015	425,903,500	93.4
INITIAL YEAR PILOT PROGRAM REPLENISHMENT STARTED ON 12/16/2015	1/13/2016	425,944,600	0.9
	2/3/2016	425,968,000	0.5
	3/2/2016	426,002,800	0.8
	4/6/2016	426,141,800	3.2
	5/4/2016	429,585,500	79.1
	6/1/2016	430,659,200	24.6
	7/6/2016	433,118,200	56.5
		SUBTOTAL	500.1
	8/3/2016	437,253,000	94.9
	9/7/2016	442,041,100	109.9
	10/5/2016	445,905,400	88.7
	11/2/2016	449,616,000	85.2
	12/7/2016	454,466,900	111.4
	1/4/2017	458,266,800	87.2
	2/1/2017	462,095,400	87.9
	3/1/2017	463,926,900	42.0
	4/5/2017	463,961,800	0.8
	5/3/2017	465,295,200	30.6
	6/7/2017	469,780,700	103.0
SECOND YEAR PILOT PROGRAM REPLENISHMENT STARTED ON 07/05/2017	7/6/2017	473,331,200	81.5
		SUBTOTAL	923.2
	8/2/2017	476,393,700	70.3
	9/6/2017	476,393,700	0.0
	10/4/2017	476,393,700	0.0
	11/1/2017	476,393,700	0.0

TABLE 1

Arcadia and Sierra Madre Monthly Production

Well	Date	Meter Reading (CF)	Production (AF)
	12/7/2017	476,393,700	0.0
	1/10/2018	476,393,700	0.0
	2/7/2018	476,393,700	0.0
	3/7/2018	476,393,700	0.0
	4/4/2018	476,393,700	0.0
	5/2/2018	479,773,500	77.6
	6/6/2018	485,393,400	129.0
	7/12/2018	491,046,400	129.8
		SUBTOTAL	406.7
		TOTAL	**2,605.0**
Orange Grove 5A	7/30/2013	356,268,200	
	8/27/2013	359,778,600	80.6
	9/26/2013	363,197,400	78.5
	10/30/2013	366,331,700	72.0
	11/26/2013	368,596,300	52.0
	12/19/2013	370,775,000	50.0
	1/22/2014	372,860,000	47.9
	2/20/2014	374,429,200	36.0
		SUBTOTAL	416.9
	3/6/2014	374,447,300	0.4
	4/2/2014	374,448,400	0.0
	6/5/2014	375,059,800	14.0
	7/2/2014	375,067,500	0.2
		SUBTOTAL	14.7
	8/7/2014	376,968,500	43.6
	9/4/2014	378,293,800	30.4
	10/2/2014	378,309,100	0.4
	11/6/2014	378,342,500	0.8
	12/4/2014	378,346,100	0.1
	1/8/2015	378,362,300	0.4
	2/5/2015	378,633,700	6.2
	3/5/2015	378,748,000	2.6
	4/2/2015	381,541,100	64.1
	5/7/2015	384,497,100	67.9
	6/4/2015	386,435,100	44.5
	7/1/2015	387,056,700	14.3
		SUBTOTAL	275.2
	8/6/2015	387,092,500	0.8
	9/3/2015	387,131,600	0.9
	10/1/2015	387,184,400	1.2
	11/5/2015	387,210,800	0.6
	12/3/2015	387,225,700	0.3

TABLE 1

Arcadia and Sierra Madre Monthly Production

Well	Date	Meter Reading (CF)	Production (AF)
INITIAL YEAR PILOT PROGRAM REPLENISHMENT STARTED ON 12/16/2015	1/13/2016	391,815,200	105.4
	2/3/2016	391,819,600	0.1
	3/2/2016	393,438,000	37.2
	4/6/2016	396,536,500	71.1
	5/4/2016	397,566,000	23.6
	6/1/2016	399,396,200	42.0
	7/6/2016	401,884,600	57.1
		SUBTOTAL	340.4
	8/3/2016	401,911,200	0.6
	9/7/2016	402,028,700	2.7
	10/5/2016	402,247,800	5.0
	11/2/2016	402,492,000	5.6
	12/7/2016	402,492,000	0.0
	1/4/2017	402,654,900	3.7
	2/1/2017	402,663,100	0.2
	3/1/2017	404,630,700	45.2
	4/5/2017	409,177,900	104.4
	5/3/2017	412,630,000	79.2
	6/7/2017	416,896,700	97.9
SECOND YEAR PILOT PROGRAM REPLENISHMENT STARTED ON 07/05/2017	7/6/2017	419,018,100	48.7
		SUBTOTAL	393.3
	8/2/2017	422,112,700	71.0
	9/6/2017	426,275,000	95.6
	10/4/2017	429,529,300	74.7
	11/1/2017	429,529,300	0.0
	12/7/2017	429,529,300	0.0
	1/10/2018	429,529,300	0.0
	2/7/2018	429,529,300	0.0
	3/7/2018	429,529,300	0.0
	4/4/2018	429,529,300	0.0
	5/2/2018	429,529,300	0.0
	6/6/2018	429,529,300	0.0
	7/12/2018	429,529,300	0.0
		SUBTOTAL	241.3
		TOTAL	**1,681.8**
Orange Grove 6	7/30/2013	356,220,200	
	8/27/2013	358,429,100	50.7
	9/26/2013	360,525,200	48.1
	10/30/2013	362,805,400	52.3
	11/26/2013	365,030,300	51.1
	12/19/2013	367,352,800	53.3
	1/22/2014	369,524,800	49.9
	2/20/2014	371,184,700	38.1

TABLE 1

Arcadia and Sierra Madre Monthly Production

Well	Date	Meter Reading (CF)	Production (AF)
		SUBTOTAL	343.5
	3/6/2014	371,192,400	0.2
	4/2/2014	371,192,400	0.0
	6/5/2014	371,426,900	5.4
	7/2/2014	371,428,900	0.0
		SUBTOTAL	5.6
	8/7/2014	372,310,300	20.2
	9/4/2014	373,457,600	26.3
	10/2/2014	373,719,900	6.0
	11/6/2014	377,163,700	79.1
	12/4/2014	378,968,400	41.4
	1/8/2015	378,986,600	0.4
	2/5/2015	379,502,100	11.8
	3/5/2015	379,611,200	2.5
	4/2/2015	382,363,300	63.2
	5/7/2015	386,512,000	95.2
	6/4/2015	388,987,200	56.8
	7/1/2015	392,475,800	80.1
		SUBTOTAL	483.2
	8/6/2015	397,189,600	108.2
	9/3/2015	399,858,000	61.3
	10/1/2015	399,907,600	1.1
	11/5/2015	399,931,500	0.5
	12/3/2015	399,944,000	0.3
INITIAL YEAR PILOT PROGRAM REPLENISHMENT STARTED ON 12/16/2015	1/13/2016	405,169,800	120.0
	2/3/2016	405,169,800	0.0
	3/2/2016	406,451,300	29.4
	4/6/2016	409,443,200	68.7
	5/4/2016	411,428,300	45.6
	6/1/2016	414,486,700	70.2
	7/6/2016	418,879,300	100.8
		SUBTOTAL	606.1
	8/3/2016	422,377,100	80.3
	9/7/2016	425,902,500	80.9
	10/5/2016	427,332,000	32.8
	11/2/2016	427,608,000	6.3
	12/7/2016	428,387,800	17.9
	1/4/2017	428,395,200	0.2
	2/1/2017	428,398,800	0.1
	3/1/2017	430,628,000	51.2
	4/5/2017	435,829,100	119.4
	5/3/2017	439,971,500	95.1
	6/7/2017	444,687,600	108.3

TABLE 1

Arcadia and Sierra Madre Monthly Production

Well	Date	Meter Reading (CF)	Production (AF)
	7/1/2017	446,438,500	40.2
SECOND YEAR PILOT PROGRAM REPLENISHMENT STARTED ON 07/05/2017		SUBTOTAL	632.7
	8/2/2017	450,653,800	96.8
	9/6/2017	455,368,500	108.2
	10/4/2017	459,406,700	92.7
	11/1/2017	463,058,400	83.8
	12/7/2017	467,037,600	91.3
	1/10/2018	470,482,600	79.1
	2/7/2018	473,329,000	65.3
	3/7/2018	476,042,900	62.3
	4/4/2018	478,822,500	63.8
	5/2/2018	481,422,800	59.7
	6/6/2018	484,661,700	74.4
	7/12/2018	487,932,200	75.1
		SUBTOTAL	952.6
		TOTAL	**3,023.7**
Anoakia	7/30/2013	209,435,500	
	8/27/2013	211,266,400	42.0
	9/26/2013	212,873,600	36.9
	10/31/2013	214,339,200	33.6
	11/26/2013	215,665,900	30.5
	12/19/2013	217,038,800	31.5
	1/22/2014	219,419,200	54.6
	2/20/2014	221,907,300	57.1
	3/6/2014	--	--
	4/2/2014	224,736,500	64.9
	5/8/2014	227,922,400	73.1
	6/5/2014	229,175,800	28.8
	7/2/2014	229,177,800	0.0
		SUBTOTAL	453.2
	8/7/2014	229,178,500	0.0
	9/4/2014	229,178,500	0.0
	10/2/2014	229,178,500	0.0
	11/6/2014	229,201,600	0.5
	12/4/2014	229,201,600	0.0
	1/8/2015	229,201,600	0.0
	2/5/2015	229,201,600	0.0
	3/5/2015	229,201,600	0.0
	4/2/2015	229,204,600	0.1
	5/7/2015	229,205,500	0.0
	6/4/2015	229,205,500	0.0
	7/1/2015	229,205,500	0.0

TABLE 1

Arcadia and Sierra Madre Monthly Production

Well	Date	Meter Reading (CF)	Production (AF)
		SUBTOTAL	0.6
	8/6/2015	229,205,500	0.0
	9/3/2015	229,205,500	0.0
	10/1/2015	229,205,500	0.0
	11/5/2015	229,205,500	0.0
	12/3/2015	229,205,500	0.0
INITIAL YEAR PILOT PROGRAM REPLENISHMENT STARTED ON 12/16/2015	1/13/2016	229,205,500	0.0
	2/3/2016	229,205,500	0.0
	3/2/2016	229,205,500	0.0
	4/6/2016	229,205,500	0.0
	5/4/2016	229,205,500	0.0
	6/1/2016	229,205,500	0.0
	7/6/2016	229,205,500	0.0
		SUBTOTAL	0.0
	8/3/2016	229,205,500	0.0
	9/7/2016	229,205,500	0.0
	10/5/2016	229,205,500	0.0
	11/2/2016	229,205,500	0.0
	12/7/2016	229,205,500	0.0
	1/4/2017	229,205,500	0.0
	2/1/2017	229,205,500	0.0
	3/1/2017	229,205,500	0.0
	4/5/2017	229,205,500	0.0
	5/3/2017	229,205,500	0.0
	6/7/2017	229,205,500	0.0
SECOND YEAR PILOT PROGRAM REPLENISHMENT STARTED ON 07/05/2017	7/6/2017	229,205,500	0.0
		SUBTOTAL	0.0
	8/2/2017	229,205,500	0.0
	9/6/2017	229,205,500	0.0
	10/4/2017	229,205,500	0.0
	11/1/2017	229,205,500	0.0
	12/7/2017	229,205,500	0.0
	1/10/2018	229,205,500	0.0
	2/7/2018	229,205,500	0.0
	3/7/2018	229,205,500	0.0
	4/4/2018	229,205,500	0.0
	5/2/2018	229,205,500	0.0
	6/6/2018	229,205,500	0.0
	7/12/2018	229,205,500	0.0
		SUBTOTAL	0.0
		TOTAL	**453.9**

TABLE 1

Arcadia and Sierra Madre Monthly Production

Well	Date	Meter Reading (CF)	Production (AF)
City of Sierra Madre			
SM 03	7/26/2013	3,877,700	
	8/25/2013	6,853,200	68.3
	9/17/2013	10,211,000	77.1
	10/30/2013	11,117,800	20.8
		SUBTOTAL	166.2
	11/15/2013	11,291,800	4.0
	12/15/2013	11,409,400	2.7
	1/16/2014	11,521,300	2.6
	2/17/2014	11,654,500	3.1
	3/6/2014	11,665,100	0.2
	3/21/2014	11,728,800	1.5
	4/2/2014	11,740,500	0.3
	5/8/2014	11,818,100	1.8
	6/5/2014	11,919,900	2.3
	7/2/2014	12,007,900	2.0
		SUBTOTAL	20.4
	8/7/2014	12,113,800	2.4
	9/4/2014	12,212,900	2.3
	10/2/2014	12,342,600	3.0
	11/6/2014	12,472,300	3.0
	12/4/2014	12,542,400	1.6
	1/8/2015	12,632,600	2.1
	2/5/2015	12,729,400	2.2
	3/5/2015	12,854,000	2.9
	4/2/2015	12,988,000	3.1
	5/7/2015	13,180,000	4.4
	6/4/2015	13,301,600	2.8
	7/1/2015	13,408,200	2.4
		SUBTOTAL	32.1
	8/6/2015	13,503,900	2.2
	9/3/2015	13,596,000	2.1
	10/1/2015	13,656,000	1.4
	11/5/2015	13,955,900	6.9
	12/3/2015	14,078,500	2.8
INITIAL YEAR PILOT PROGRAM REPLENISHMENT STARTED ON 12/16/2015	1/13/2016	16,100,900	46.4
	2/3/2016	17,761,200	38.1
	3/2/2016	20,158,400	55.0
	4/6/2016	23,447,600	75.5
	5/4/2016	26,276,200	64.9
	6/1/2016	29,207,600	67.3
	7/6/2016	32,896,100	84.7
		SUBTOTAL	447.4

TABLE 1

Arcadia and Sierra Madre Monthly Production

Well	Date	Meter Reading (CF)	Production (AF)
	8/3/2016	36,554,700	84.0
	9/7/2016	38,659,300	48.3
	10/5/2016	39,574,100	21.0
	11/2/2016	42,745,400	72.8
	12/7/2016	45,493,200	63.1
	1/4/2017	47,363,500	42.9
	2/1/2017	48,874,900	34.7
	3/1/2017	49,118,000	5.6
	4/5/2017	50,419,600	29.9
	5/3/2017	53,761,500	76.7
	6/7/2017	54,929,400	26.8
SECOND YEAR PILOT PROGRAM REPLENISHMENT STARTED ON 07/05/2017	7/6/2017	56,592,900	38.2
		SUBTOTAL	544.0
	8/2/2017	57,588,100	22.8
	9/6/2017	59,400,900	41.6
	10/4/2017	60,801,100	32.1
	11/1/2017	62,817,100	46.3
	12/7/2017	65,564,500	63.1
	1/4/2018	65,965,600	9.2
	2/7/2018	66,431,200	10.7
	3/7/2018	66,683,000	5.8
	4/4/2018	66,755,000	1.7
	5/2/2018	66,922,400	3.8
	6/6/2018	67,087,300	3.8
	7/12/2018	67,348,800	6.0
		SUBTOTAL	246.9
		TOTAL	**1,457.1**
SM 04	7/26/2013	78,604,300	
	8/25/2013	78,651,700	1.1
	9/17/2013	78,711,200	1.4
	10/30/2013	78,731,400	0.5
		SUBTOTAL	2.9
	11/15/2013	78,755,000	0.5
	12/15/2013	78,779,600	0.6
	1/16/2014	78,794,100	0.3
	2/17/2014	78,808,400	0.3
	3/6/2014	78,811,000	0.1
	3/21/2014	78,820,400	0.2
	4/2/2014	78,822,700	0.1
	6/5/2014	78,889,300	1.5
	7/2/2014	78,937,200	1.1

TABLE 1

Arcadia and Sierra Madre Monthly Production

Well	Date	Meter Reading (CF)	Production (AF)
		SUBTOTAL	4.7
	8/7/2014	78,963,400	0.6
	9/4/2014	78,983,600	0.5
	10/2/2014	79,014,500	0.7
	11/6/2014	79,041,400	0.6
	12/4/2014	79,065,200	0.5
	1/8/2015	79,088,200	0.5
	2/5/2015	79,108,100	0.5
	3/5/2015	79,133,300	0.6
	4/2/2015	79,151,100	0.4
	5/7/2015	79,174,800	0.5
	6/4/2015	79,197,500	0.5
	6/30/2015	79,225,300	0.6
		SUBTOTAL	6.6
	8/6/2015	79,255,100	0.7
	9/3/2015	79,279,500	84.7
	9/30/2015	79,317,900	0.9
	11/4/2015	79,361,200	1.0
	12/1/2015	79,390,300	0.7
INITIAL YEAR PILOT PROGRAM REPLENISHMENT STARTED ON 12/16/2015	1/12/2016	79,502,100	2.6
	2/3/2016	79,601,600	2.3
	3/2/2016	80,117,400	11.8
	4/5/2016	80,331,400	4.9
	5/4/2016	80,526,800	4.5
	6/1/2016	80,610,800	1.9
	7/6/2016	80,931,100	7.4
		SUBTOTAL	123.3
	8/2/2016	81,039,900	2.5
	9/7/2016	81,621,800	13.4
	10/5/2016	81,898,400	6.3
	11/2/2016	81,959,400	1.4
	12/7/2016	82,357,800	9.1
	1/4/2017	82,949,000	13.6
	2/1/2017	83,030,100	1.9
	3/1/2017	83,146,000	2.7
	4/5/2017	83,251,600	2.4
	5/3/2017	83,353,100	2.3
	6/7/2017	83,475,800	2.8
SECOND YEAR PILOT PROGRAM REPLENISHMENT STARTED ON 07/05/2017	7/6/2017	83,849,400	8.6
		SUBTOTAL	67.0
	8/2/2017	84,713,600	19.8
	9/5/2017	85,856,200	26.2
	10/4/2017	86,014,500	3.6
	11/1/2017	86,014,500	0.0

TABLE 1

Arcadia and Sierra Madre Monthly Production

Well	Date	Meter Reading (CF)	Production (AF)
	12/7/2017	86,934,900	21.1
	1/4/2018	87,119,100	4.2
	2/7/2018	88,013,800	20.5
	3/7/2018	88,296,500	6.5
	4/4/2018	88,566,900	6.2
	5/2/2018	89,074,100	11.6
	6/5/2018	89,615,300	12.4
	7/12/2018	90,345,000	16.8
		SUBTOTAL	149.1
		TOTAL	**353.6**
SM 05	7/26/2013	92,861,700	
	8/25/2013	96,383,600	80.9
	9/17/2013	99,394,900	69.1
	10/30/2013	100,500,000	25.4
		SUBTOTAL	175.4
	11/15/2013	100,618,600	2.7
	12/15/2013	100,732,600	2.6
	1/16/2014	100,833,100	2.3
	2/17/2014	100,915,200	1.9
	3/6/2014	100,927,700	0.3
	3/21/2014	101,017,800	2.1
	4/2/2014	101,025,800	0.2
	6/5/2014	101,230,900	4.7
	7/2/2014	101,332,210	2.3
		SUBTOTAL	19.1
	8/7/2014	101,489,100	3.6
	9/4/2014	101,586,300	2.2
	10/2/2014	101,653,100	1.5
	11/6/2014	101,719,000	1.5
	12/4/2014	101,754,600	0.8
	1/8/2015	101,839,800	2.0
	2/5/2015	101,899,900	1.4
	3/5/2015	101,951,000	1.2
	4/2/2015	101,979,700	0.7
	5/7/2015	102,039,800	1.4
	6/4/2015	102,075,700	0.8
	7/1/2015	102,096,600	0.5
		SUBTOTAL	17.5
	8/6/2015	102,134,700	0.9
	9/3/2015	102,158,700	0.6
	10/1/2015	102,207,800	1.1

TABLE 1

Arcadia and Sierra Madre Monthly Production

Well	Date	Meter Reading (CF)	Production (AF)
	11/5/2015	102,261,000	1.2
	12/3/2015	102,290,700	0.7
INITIAL YEAR PILOT PROGRAM REPLENISHMENT STARTED ON 12/16/2015	1/13/2016	103,936,500	37.8
	2/3/2016	106,004,200	47.5
	3/2/2016	108,888,800	66.2
	4/6/2016	112,185,400	75.7
	5/4/2016	115,155,600	68.2
	6/1/2016	116,101,100	21.7
	7/6/2016	118,190,200	48.0
		SUBTOTAL	369.5
	8/3/2016	119,668,100	33.9
	9/7/2016	123,664,600	91.7
	10/5/2016	126,882,800	73.9
	11/2/2016	127,590,200	16.2
	12/7/2016	130,490,700	66.6
	1/4/2017	131,089,000	13.7
	2/1/2017	133,321,200	51.2
	3/1/2017	134,265,800	21.7
	4/5/2017	136,813,700	58.5
	5/3/2017	138,391,500	36.2
	6/7/2017	142,522,200	94.8
SECOND YEAR PILOT PROGRAM REPLENISHMENT STARTED ON 07/05/2017	7/6/2017	145,815,200	75.6
		SUBTOTAL	634.2
	8/2/2017	149,206,700	77.9
	9/6/2017	152,331,600	71.7
	10/4/2017	155,078,700	63.1
	11/1/2017	157,297,300	50.9
	12/7/2017	159,217,600	44.1
	1/4/2018	162,399,100	73.0
	2/7/2018	165,463,600	70.4
	3/7/2018	168,308,700	65.3
	4/4/2018	170,749,600	56.0
	5/2/2018	174,072,800	76.3
	6/6/2018	178,100,000	92.5
	7/12/2018	182,983,600	112.1
		SUBTOTAL	853.3
		TOTAL	**2,068.9**
SM 06	7/26/2013	100,479,400	
	8/25/2013	104,685,500	96.6
	9/17/2013	108,735,700	93.0
	10/30/2013	110,021,700	29.5
		SUBTOTAL	219.1

TABLE 1

Arcadia and Sierra Madre Monthly Production

Well	Date	Meter Reading (CF)	Production (AF)
	11/15/2013	110,101,000	1.8
	12/15/2013	110,312,400	4.9
	1/16/2014	110,416,200	2.4
	2/17/2014	110,482,200	1.5
	3/6/2014	110,501,800	0.4
	3/21/2014	110,546,900	1.0
	4/2/2014	110,559,700	0.3
	6/5/2014	110,725,700	3.8
	7/2/2014	110,788,700	1.4
		SUBTOTAL	17.6
	8/7/2014	110,953,300	3.8
	9/4/2014	111,023,100	1.6
	10/2/2014	111,238,400	4.9
	11/6/2014	111,293,800	1.3
	12/4/2014	111,345,500	1.2
	1/8/2015	111,389,900	1.0
	2/5/2015	111,451,800	1.4
	3/5/2015	111,485,600	0.8
	4/2/2015	111,514,200	0.7
	5/7/2015	111,547,200	0.8
	6/4/2015	111,575,900	0.7
	6/30/2015	111,606,300	0.7
		SUBTOTAL	18.8
	8/6/2015	111,639,600	0.8
	9/3/2015	111,675,000	0.8
	9/30/2015	111,714,000	0.9
	11/4/2015	111,765,200	1.2
	12/1/2015	111,801,100	0.8
INITIAL YEAR PILOT PROGRAM REPLENISHMENT STARTED ON 12/16/2015	1/13/2016	114,238,000	55.9
	2/3/2016	114,268,000	0.7
	3/2/2016	114,268,000	0.0
	4/5/2016	114,329,900	1.4
	5/4/2016	114,354,200	0.6
	6/1/2016	116,761,800	55.3
	7/6/2016	120,766,600	91.9
		SUBTOTAL	210.3
	8/3/2016	124,150,000	77.7
	9/7/2016	128,375,900	97.0
	10/5/2016	131,994,700	83.1
	11/2/2016	135,562,900	81.9
	12/7/2016	137,602,500	46.8
	1/4/2017	139,673,000	47.5
	2/1/2017	140,177,600	11.6
	3/1/2017	141,597,900	32.6

TABLE 1

Arcadia and Sierra Madre Monthly Production

Well	Date	Meter Reading (CF)	Production (AF)
	4/5/2017	143,234,900	37.6
	5/3/2017	145,200,800	45.1
	6/7/2017	148,955,300	86.2
SECOND YEAR PILOT PROGRAM REPLENISHMENT STARTED ON 07/05/2017	7/6/2017	152,496,900	81.3
		SUBTOTAL	728.4
	8/2/2017	155,957,200	79.4
	9/5/2017	160,959,500	114.8
	10/4/2017	164,952,300	91.7
	11/1/2017	168,399,400	79.1
	12/7/2017	171,851,700	79.3
	1/4/2018	175,359,800	80.5
	2/7/2018	178,827,000	79.6
	3/7/2018	182,003,600	72.9
	4/4/2018	184,474,800	56.7
	5/2/2018	187,990,400	80.7
	6/6/2018	192,372,700	100.6
	7/12/2018	197,709,000	122.5
		SUBTOTAL	1,037.9
		TOTAL	**2,232.1**
PASADENA SUBAREA			
City of Arcadia			
Chapman 7	7/30/2013	366,408,200	
	8/27/2013	370,403,400	91.7
	9/26/2013	374,167,100	86.4
	10/30/2013	376,450,100	52.4
	11/26/2013	380,056,600	82.8
	12/19/2013	383,021,400	68.1
	1/22/2014	387,190,700	95.7
	2/20/2014	390,729,400	81.2
	3/6/2014	--	--
	4/2/2014	394,292,600	81.8
	5/8/2014	398,456,800	95.6
	6/5/2014	401,509,000	70.1
	7/2/2014	404,472,500	68.0
		SUBTOTAL	873.8
	8/7/2014	407,982,600	80.6
	9/4/2014	410,375,600	54.9
	10/2/2014	412,653,200	52.3
	11/6/2014	413,815,900	26.7
	12/4/2014	413,816,800	0.0
	1/8/2015	417,202,900	77.7

TABLE 1

Arcadia and Sierra Madre Monthly Production

Well	Date	Meter Reading (CF)	Production (AF)
	2/5/2015	420,785,300	82.2
	3/5/2015	425,114,400	99.4
	4/2/2015	429,481,400	100.3
	5/7/2015	434,362,500	112.1
	6/4/2015	438,377,900	92.2
	7/1/2015	442,022,900	83.7
		SUBTOTAL	862.0
	8/6/2015	446,736,900	108.2
	9/3/2015	450,150,300	78.4
	10/1/2015	453,717,500	81.9
	11/5/2015	458,044,100	99.3
	12/3/2015	460,964,800	67.1
INITIAL YEAR PILOT PROGRAM REPLENISHMENT STARTED ON 12/16/2015	1/13/2016	465,280,300	99.1
	2/3/2016	465,776,600	11.4
	3/2/2016	465,776,600	0.0
	4/6/2016	465,776,600	0.0
	5/4/2016	465,794,500	0.4
	6/1/2016	465,794,500	0.0
	7/6/2016	465,794,500	0.0
		SUBTOTAL	545.7
	8/3/2016	465,794,500	0.0
	9/7/2016	465,794,500	0.0
	10/5/2016	465,794,500	0.0
	11/2/2016	465,794,500	0.0
	12/7/2016	465,794,500	0.0
	1/4/2017	465,794,500	0.0
	2/1/2017	465,794,500	0.0
	3/1/2017	465,794,500	0.0
	4/5/2017	465,794,500	0.0
	5/3/2017	465,794,500	0.0
	6/7/2017	465,794,500	0.0
SECOND YEAR PILOT PROGRAM REPLENISHMENT STARTED ON 07/05/2017	7/6/2017	465,794,500	0.0
		SUBTOTAL	0.0
	8/2/2017	465,794,500	0.0
	9/6/2017	465,794,500	0.0
	10/4/2017	465,794,500	0.0
	11/1/2017	465,794,500	0.0
	12/7/2017	465,794,500	0.0
	1/10/2018	465,794,500	0.0
	2/7/2018	465,794,500	0.0
	3/7/2018	465,794,500	0.0
	4/4/2018	465,794,500	0.0
	5/2/2018	465,794,500	0.0
	6/6/2018	465,794,500	0.0
	7/12/2018	465,794,500	0.0

TABLE 1

Arcadia and Sierra Madre Monthly Production

Well	Date	Meter Reading (CF)	Production (AF)
		SUBTOTAL	0.0
		TOTAL	**2,281.6**
Colorado	7/30/2013	44,208,000	
	8/27/2013	45,769,100	35.8
	9/26/2013	47,227,500	33.5
	10/30/2013	48,783,300	35.7
	11/26/2013	50,319,300	35.3
	12/19/2013	52,304,600	45.6
	1/22/2014	54,168,200	42.8
	2/20/2014	55,784,800	37.1
	3/6/2014	56,091,600	7.0
	4/2/2014	57,469,600	31.6
	5/8/2014	59,139,600	38.3
	6/5/2014	60,367,500	28.2
	7/2/2014	61,584,500	27.9
		SUBTOTAL	398.9
	8/7/2014	63,150,800	36.0
	9/4/2014	64,338,700	27.3
	10/2/2014	65,512,500	26.9
	11/6/2014	66,603,400	25.0
	12/4/2014	66,653,500	1.2
	1/8/2015	68,112,200	33.5
	2/5/2015	69,636,700	35.0
	3/5/2015	71,653,200	46.3
	4/2/2015	73,439,600	41.0
	5/7/2015	75,527,200	47.9
	6/4/2015	77,259,600	39.8
	7/1/2015	78,957,600	39.0
		SUBTOTAL	398.8
	8/6/2015	81,104,000	49.3
	9/3/2015	82,841,400	39.9
	10/1/2015	84,410,300	36.0
	11/5/2015	86,102,300	38.8
	12/3/2015	87,715,900	37.0
INITIAL YEAR PILOT PROGRAM REPLENISHMENT STARTED ON 12/16/2015	1/13/2016	89,710,200	45.8
	2/3/2016	90,988,700	29.4
	3/2/2016	92,885,100	43.5
	4/6/2016	95,172,400	52.5
	5/4/2016	96,667,700	34.3
	6/1/2016	98,000,000	30.6
	7/6/2016	100,009,300	46.1

TABLE 1

Arcadia and Sierra Madre Monthly Production

Well	Date	Meter Reading (CF)	Production (AF)
		SUBTOTAL	483.3
	8/3/2016	101,745,700	39.9
	9/7/2016	103,762,700	46.3
	10/5/2016	105,347,100	36.4
	11/2/2016	107,043,100	38.9
	12/7/2016	109,172,400	48.9
	1/4/2017	110,909,600	39.9
	2/1/2017	112,753,100	42.3
	3/1/2017	114,626,600	43.0
	4/5/2016	116,523,200	43.5
	5/3/2017	117,364,500	19.3
	6/7/2017	118,272,300	20.8
SECOND YEAR PILOT PROGRAM REPLENISHMENT STARTED ON 07/05/2017	7/6/2017	120,023,500	40.2
		SUBTOTAL	459.5
	8/2/2017	121,644,200	37.2
	9/6/2017	123,785,700	49.2
	10/4/2017	125,487,400	39.1
	11/1/2017	127,253,400	40.5
	12/7/2017	129,724,300	56.7
	1/10/2018	132,004,000	52.3
	2/7/2018	133,550,100	35.5
	3/7/2018	135,548,400	45.9
	4/4/2018	137,439,400	43.4
	5/2/2018	139,131,200	38.8
	6/6/2018	141,392,400	51.9
	7/12/2018	143,598,800	50.7
		SUBTOTAL	541.2
		TOTAL	**2,281.7**

Abbreviations

CF - Cubic Feet

AF - Acre-Feet

ATTACHMENT A

City of Sierra Madre
Public Works Department

November 20, 2015

Mr. Anthony Zampiello
Executive Officer
Raymond Basin Management Board
725 North Azusa Avenue
Azusa, CA 91702

Subject: City of Sierra Madre Request to Spread MWD Imported Water in the Santa Anita Subarea

Dear Mr. Zampiello:

At its October 21, 2015 meeting, the Raymond Basin Management Board (RBMB) discussed the Staff Report on the City of Sierra Madre's (Sierra Madre's) request to spread imported water at our Sierra Madre Spreading Grounds (S.G.) to help replenish the Santa Anita Subarea of the Raymond Basin in the vicinity of Sierra Madre's wells. Prior to that request, Sierra Madre staff had been meeting with City of Arcadia (Arcadia) staff and RBMB staff, as part of the Sierra Madre Arcadia Aquifer Recovery Team (SMAART), and has been provided information on the Sierra Madre replenishment proposal in conjunction with the SMAART meetings. The SMAART meetings have focused on data collection (static water levels, groundwater production water supply and groundwater replenishment) and development of a draft Santa Anita Subarea management plan. Despite significantly reduced groundwater production in the Santa Anita Subarea since October 2013, groundwater levels have only increased by about 35 feet to about elevation 380 feet above mean sea level (msl), as of the beginning of October 2015 at Sierra Madre's wellfield. The failure to achieve a greater increase in the static water level in the Santa Anita Subarea is partially the result of the on-going drought and the lack of stormwater runoff for groundwater replenishment. It is the goal of Sierra Madre, in cooperation with Arcadia and the RBMB, to have static groundwater levels in the Santa Anita Subarea return to, and be maintained, above elevation 500 feet msl to avoid potentially reduced pumping required by Section VI (3) of the Raymond Basin Judgment.

Sierra Madre recognizes significant additional information on the hydrogeology of the Santa Anita Subarea, and the fate of the replenished import water, is needed to fully understand the impacts (water levels and water quality) of our replenishment proposal. Therefore, Sierra Madre requests a Monitoring Program be developed, along with the following.

1. The initial replenishment program will occur for up to 12 consecutive months (Pilot Program). At the end of those 12 months, Sierra Madre will temporarily discontinue the Pilot Program until such a time a report is prepared by Sierra Madre, distributed to all RBMB members and addressed at a regular RBMB quarterly meeting, or if necessary, at a special meeting of the RBMB. The RBMB will determine if the replenishment program may continue, and, if so, under what terms.
2. Collect additional data to augment the monthly data already collected by SMAART, as noted below. Particular emphasis should be placed on any water quality constituent in MWD treated imported water which exceeds the Regional Water Quality Control Board's (RWQCB's) Basin Plan Water Quality Objectives (WQOs) for the Santa Anita Subarea.
    a. Water quality data of the treated water from Metropolitan Water District of Southern California's (MWD's) Weymouth Treatment Plant. (This information is already available from MWD.)
    b. Water quality samples from each of Sierra Madre's production wells for at least Total Dissolved Solids (TDS) and Sulfate for the duration of the Pilot Program, and as needed following replenishment activities. These two constituents are known to exceed the RWQCB WQOs and are significantly higher than ambient Santa Anita Subarea groundwater quality. Water quality data should be used as a mechanism to identify the effectiveness of the Pilot Program to replenish the Santa Anita Subarea and the supply the Sierra Madre Wells.
    c. Water quality samples from each of Arcadia's production wells for at least TDS and Sulfate for the duration of the Pilot Program, and as needed following replenishment activities.
    d. Records from Sierra Madre of the amount of MWD imported water replenished, static water levels at each of its wells and groundwater production from each of its wells.
    e. Records from Sierra Madre of the amount of stormwater, tunnel water, street runoff, and any other "local" water supply replenished in the Sierra Madre S.G.
3. Sierra Madre will organize the data collected (including data provided by SMAART and Arcadia) into a Program report on the results of the Pilot Program, including, but not limited to static water levels, flow direction and groundwater quality. The draft annual report is to be presented to the RBMB Board for review prior to any extension to the Pilot Program.
4. The RBMB is considering construction of up to three new monitoring wells within the Raymond Basin. It is requested that at least one of those monitoring wells be located in the Santa Anita Subarea. The location and construction details of any Santa Anita Subarea monitoring well(s) are to be mutually agreed upon by Sierra Madre, Arcadia and RBMB staff.
5. The data collected by Sierra Madre is to be shared with RBMB and Arcadia on a monthly basis. RBMB staff, Arcadia and Sierra Madre mutually agree on implementation of the Monitoring Plan.

6. Sierra Madre urges support of our plan to spread MWD imported water which is intended to improve the water supply and static water levels in the Santa Anita Subarea and to collect data as part of a Monitoring Program, in conjunction with the Pilot Program, to better understand the hydrogeology of the Santa Anita Subarea. Sierra Madre

acknowledges use of MWD imported water may impact the water quality in Sierra Madre's groundwater wells. Consequently, Sierra Madre reserves the right to request the Pilot Program be suspended due to water quality impacts prior to the conclusion.

Sierra Madre hereby supports the Sierra Madre Replenishment Program and fully understands the RBMB is coordinating implementation of this Replenishment Program for the benefit of Arcadia and Sierra Madre. Sierra Madre will not hold the RBMB responsible for any unforeseen negative impacts of this Replenishment Project.

Please feel free to contact me should you have any questions.

Sincerely,

B. Inman

Bruce Inman
Director of Public Works
City of Sierra Madre

ATTACHMENT B

City of Arcadia

Public Works Services Department

Tom Tait
Public Works Services Director

January 6, 2016

Mr. Anthony Zampiello
Executive Officer
Raymond Basin Management Board
725 North Azusa Avenue
Azusa, CA 91702

Subject: City of Sierra Madre Request to Spread MWD Imported Water in the Santa Anita Subarea

Dear Mr. Zampiello:

At its October 21, 2015 meeting, the Raymond Basin Management Board (RBMB) discussed the Staff Report on the City of Sierra Madre's (Sierra Madre's) request to spread imported water at its Sierra Madre Spreading Grounds (S.G.) to help replenish the Santa Anita Subarea of the Raymond Basin in the vicinity of Sierra Madre's wells. The City of Arcadia (Arcadia) staff has been meeting with Sierra Madre staff and RBMB staff, as part of the Sierra Madre Arcadia Aquifer Recovery Team (SMAART), and has been provided information on the Sierra Madre replenishment proposal in conjunction with the SMAART meetings. The SMAART meetings have focused on data collection (static water levels, groundwater production water supply and groundwater replenishment) and development of a draft Santa Anita Subarea management plan.

The City of Arcadia conditionally supports the replenishment proposal by Sierra Madre to spread MWD imported water. However, significant additional information on the hydrogeology of the Santa Anita Subarea, and the fate of the replenished MWD import water, is needed to fully understand the impacts (water levels and water quality) of the Sierra Madre replenishment proposal. Therefore, Arcadia requests a Monitoring Program be developed, along with the following.

1. The initial replenishment program will occur for up to 12 consecutive months (Pilot Program). At the end of those 12 months, Sierra Madre will temporarily discontinue the Pilot Program until such a time a report is prepared and presented to the Raymond Basin Pumping and Storage Committee and at a regular RBMB quarterly meeting, or if necessary, at a special meeting of the RBMB. The RBMB will determine if the replenishment program may continue, and, if so, under what terms.

2. Collect additional data to augment the monthly data already collected by SMAART, as noted below. Particular emphasis should be placed on any water quality constituent in the MWD treated imported water which exceeds the Regional Water Quality Control Board's (RWQCB's) Basin Plan Water Quality Objectives (WQOs) for the Santa Anita Subarea.

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a. Water quality data of the treated water from Metropolitan Water District of Southern California's (MWD's) Weymouth Treatment Plant. (This information is already available from MWD.)
b. Water quality samples from each of Sierra Madre's production wells for at least Total Dissolved Solids (TDS) and Sulfate for the duration of the Pilot Program, and as needed following replenishment activities. These two constituents are known to exceed the RWQCB WQOs and are significantly higher than ambient Santa Anita Subarea groundwater quality. Water quality data should be used as a mechanism to identify the effectiveness of the Pilot Program to replenish the Santa Anita Subarea and the supply for the Sierra Madre Wells.
c. Water quality samples from each of Arcadia's production wells for at least TDS and Sulfate for the duration of the Pilot Program, and as needed following replenishment activities.
d. Records from Sierra Madre of the amount of MWD imported water replenished; static water levels at each of its wells, and groundwater production from each of its wells.
e. Records from Sierra Madre of the amount of stormwater, tunnel water, street runoff, and any other "local" water supply replenished in the Sierra Madre S.G.

3. Raymond Basin staff and or engineer should organize the data collected (including data provided by SMAART and Arcadia) into a Program report on the results of the Pilot Program, including, but not limited to static water levels, flow direction and groundwater quality. The draft Program report is to be presented to the Pumping and Storage Committee and the RBMB for review prior to any extension to the Pilot Program.

4. The RBMB is considering construction of up to three new monitoring wells within the Raymond Basin. It is requested that at least one of those monitoring wells be located in the Santa Anita Subarea. The location and construction details of any Santa Anita Subarea monitoring well(s) are to be mutually agreed upon by Sierra Madre, Arcadia and RBMB staff.

5. The data collected by Raymond Basin staff is to be shared with RBMB and Arcadia on a monthly basis. RBMB staff, Arcadia and Sierra Madre mutually agree on implementation of the Monitoring Plan.

6. Arcadia is supportive of the plan by Sierra Madre to spread MWD imported water which is intended to improve the water supply and static water levels in the Santa Anita Subarea and to collect data as part of a Monitoring Program, in conjunction with the Pilot Program, to better understand the hydrogeology of the Santa Anita Subarea. Arcadia acknowledges use of MWD imported water may impact the water quality in Arcadia's groundwater wells. Consequently, Arcadia reserves the right to request the Pilot Program be suspended due to water quality impacts prior to the conclusion of the Pilot Program.

Arcadia hereby supports the Sierra Madre Replenishment Program and fully understands the RBMB is coordinating implementation of this Replenishment Program for the benefit of Arcadia and Sierra Madre. Arcadia will not hold the RBMB responsible for any unforeseen negative impacts of this Replenishment Program.

Please feel free to contact me should you have any questions.

Sincerely,

Tom Tait
Public Works Services Director

ATTACHMENT C

HISTORIC WATER LEVELS AT ARCADIA WELLS

Orange Grove 1A

Date Measured	Reference Elevation (ft msl)	Depth to Water (ft)	Groundwater Elevation (ft msl)
9/26/2013	604.35	259.00	345.35
10/30/2013	604.35	255.00	349.35
11/26/2013	604.35	251.00	353.35
12/19/2013	604.35	250.00	354.35
1/22/2014	604.35	246.00	358.35
2/20/2014	604.35	257.00	347.35
3/6/2014	604.35	245.01	359.34
4/2/2014	604.35	236.92	367.43
5/8/2014	604.35	231.43	372.92
6/5/2014	604.35	226.81	377.54
7/2/2014	604.35	221.48	382.87
8/7/2014	604.35	228.89	375.46
9/4/2014	604.35	228.84	375.51
10/2/2014	604.35	228.18	376.17
11/6/2014	604.35	228.69	375.66
12/4/2014	604.35	221.59	382.76
1/8/2015	604.35	213.79	390.56
2/5/2015	604.35	215.22	389.13
3/5/2015	604.35	224.63	379.72
4/2/2015	604.35	228.98	375.37
5/7/2015	604.35	232.66	371.69
6/4/2015	604.35	233.63	370.72
7/1/2015	604.35	229.23	375.12
8/6/2015	604.35	228.93	375.42
9/3/2015	604.35	227.69	376.66
10/1/2015	604.35	225.99	378.36
11/5/2015	604.35	226.04	378.31
12/3/2015	604.35	228.13	376.22
1/13/2016	604.35	230.09	374.26
2/3/2016	604.35	223.23	381.12
3/2/2016	604.35	224.49	379.86
4/6/2016	604.35	227.14	377.21
5/4/2016	604.35	225.76	378.59
6/1/2016	604.35	220.79	383.56
7/6/2016	604.35	234.38	369.97
8/3/2016	604.35	240.35	364.00
9/7/2016	604.35	238.90	365.45
10/5/2016	604.35	235.87	368.48
11/2/2016	604.35	235.51	368.84
12/7/2016	604.35	228.10	376.25
1/4/2017	604.35	223.50	380.85
2/1/2017	604.35	221.10	383.25
3/1/2017	604.35	219.24	385.11
4/5/2017	604.35	217.24	387.11
5/3/2017	604.35	222.70	381.65
6/7/2017	604.35	225.95	378.40
7/6/2017	604.35	230.04	374.31
8/2/2017	604.35	236.20	368.15
9/6/2017	604.35	230.60	373.75
10/4/2017	604.35	226.80	377.55
11/1/2017	604.35	218.90	385.45
12/7/2017	604.35	214.10	390.25
1/10/2018	604.35	211.25	393.10
2/7/2018	604.35	211.40	392.95
3/7/2018	604.35	211.55	392.80
4/4/2018	604.35	211.95	392.40
5/2/2018	604.35	219.40	384.95
6/6/2018	604.35	228.05	376.30
7/12/2018	604.35	234.55	369.80

Orange Grove 2A

Date Measured	Reference Elevation (ft msl)	Depth to Water (ft)	Groundwater Elevation (ft msl)
9/26/2013	604.20	266.00	338.20
10/30/2013	604.20	263.00	341.20
11/26/2013	604.20	257.00	347.20
12/19/2013	604.20	256.00	348.20
1/22/2014	604.20	254.00	350.20
2/20/2014	604.20	265.00	339.20
3/6/2014	604.20	246.00	358.20
4/2/2014	604.20	238.73	365.47

HISTORIC WATER LEVELS AT ARCADIA WELLS

Orange Grove 4A

Date Measured	Reference Elevation (ft msl)	Depth to Water (ft)	Groundwater Elevation (ft msl)
3/6/2014		254.90	
4/2/2014		247.70	

Orange Grove 5

Date Measured	Reference Elevation (ft msl)	Depth to Water (ft)	Groundwater Elevation (ft msl)
9/26/2013	609.90	271.00	338.90
10/30/2013	609.90	266.00	343.90
11/26/2013	609.90	261.00	348.90
12/19/2013	609.90	259.00	350.90
1/22/2014	609.90	256.00	353.90
2/20/2014	609.90	265.00	344.90
3/6/2014	609.90	252.33	357.57
4/2/2014	609.90	244.50	365.40

HISTORIC WATER LEVELS AT ARCADIA WELLS

Orange Grove 6

Date Measured	Reference Elevation (ft msl)	Depth to Water (ft)	Groundwater Elevation (ft msl)
9/26/2013	612.00	274.00	338.00
10/30/2013	612.00	271.00	341.00
11/26/2013	612.00	265.00	347.00
12/19/2013	612.00	264.00	348.00
1/22/2014	612.00	262.00	350.00
2/20/2014	612.00	272.00	340.00
3/6/2014	612.00	254.00	358.00
4/2/2014	612.00	247.36	364.64

Anoakia 1

Date Measured	Reference Elevation (ft msl)	Depth to Water (ft)	Groundwater Elevation (ft msl)
9/26/2013	694.00	375.00	319.00
10/31/2013	694.00	366.00	328.00
11/26/2013	694.00	356.00	338.00
12/19/2013	694.00	358.00	336.00
1/22/2014	694.00	366.00	328.00
2/2/2014	694.00	381.00	313.00
3/6/2014	694.00	374.50	319.50
4/2/2014	694.00	374.50	319.50
5/8/2014	694.00	367.50	326.50
6/5/2014	694.00	331.50	362.50
7/2/2014	694.00	325.50	368.50
8/7/2014	694.00	322.80	371.20
9/4/2014	694.00	323.30	370.70
10/2/2014	694.00	320.00	374.00
11/6/2014	694.00	311.00	383.00
12/4/2014	694.00	305.00	389.00
1/8/2015	694.00	316.10	377.90
2/5/2015	694.00	323.20	370.80
3/5/2015	694.00	324.80	369.20
4/2/2015	694.00	329.00	365.00
5/7/2015	694.00	329.80	364.20
6/4/2015	694.00	329.90	364.10
7/1/2015	694.00	327.80	366.20
8/6/2015	694.00	326.90	367.10
9/3/2015	694.00	327.00	367.00
10/1/2015	694.00	326.00	368.00
11/5/2015	694.00	325.30	368.70
12/3/2015	694.00	322.00	372.00
1/13/2016	694.00	324.60	369.40
2/3/2016	694.00	316.80	377.20
3/2/2016	694.00	316.00	378.00
4/6/2016	694.00	317.26	376.74
5/4/2016	694.00	318.00	376.00
6/1/2016	694.00	315.00	379.00
7/6/2016	694.00	320.00	374.00
8/3/2016	694.00	322.00	372.00
9/7/2016	694.00	324.00	370.00
10/5/2016	694.00	324.00	370.00
11/2/2016	694.00	322.00	372.00
12/7/2016	694.00	322.00	372.00
1/4/2017	694.00	318.00	376.00
2/1/2017	694.00	317.10	376.90
3/1/2017	694.00	314.40	379.60
4/5/2017	694.00	311.00	383.00
5/1/2017	694.00	311.58	382.42
6/7/2017	694.00	310.00	384.00
7/6/2017	694.00	310.00	384.00
8/2/2017	694.00	311.00	383.00
9/6/2017	694.00	312.00	382.00
10/19/2017	694.00	318.00	376.00
11/1/2017	694.00	318.00	376.00
12/27/2017	694.00	314.00	380.00
1/10/2018	694.00	312.00	382.00
2/7/2018	694.00	310.75	383.25
3/7/2018	694.00	313.80	380.20
4/4/2018	694.00	310.71	383.29
5/2/2018	694.00	314.00	380.00
6/6/2018	694.00	317.90	376.10
7/12/2018	694.00	321.81	372.19

HISTORIC WATER LEVELS AT ARCADIA WELLS

Chapman 6

Date Measured	Reference Elevation (ft msl)	Depth to Water (ft)	Groundwater Elevation (ft msl)
3/6/2014	633.00	187.80	445.20
4/2/2014	633.00	189.39	443.61
5/8/2014	633.00	190.07	442.93
6/5/2014	633.00	190.23	442.77
7/2/2014	633.00	190.31	442.69
8/7/2014	633.00	189.29	443.71
9/4/2014	633.00	189.44	443.56
10/2/2014	633.00	189.57	443.43
11/6/2014	633.00	188.89	444.11
12/4/2014	633.00	188.29	444.71
1/8/2015	633.00	188.09	444.91
2/5/2015	633.00	191.01	441.99
3/5/2015	633.00	191.77	441.23
4/2/2015	633.00	192.53	440.47
5/7/2015	633.00	193.23	439.77
6/4/2015	633.00	193.33	439.67
7/1/2015	633.00	193.23	439.77
8/6/2015	633.00	193.66	439.34
9/3/2015	633.00	192.84	440.16
10/1/2015	633.00	193.95	439.05
11/5/2015	633.00	194.17	438.83
12/3/2015	633.00	193.54	439.46
1/13/2016	633.00	193.88	439.12
2/3/2016	633.00	192.61	440.39
3/2/2016	633.00	192.50	440.50
4/6/2016	633.00	192.68	440.32
5/4/2016	633.00	193.78	439.22
6/1/2016	633.00	193.35	439.65
7/6/2016	633.00	194.02	438.98
8/3/2016	633.00	194.33	438.67
9/7/2016	633.00	195.06	437.94
10/5/2016	633.00	195.45	437.55
11/2/2016	633.00	195.45	437.55
12/7/2016	633.00	195.75	437.25
1/4/2017	633.00	196.10	436.90
2/1/2017	633.00	195.60	437.40
3/1/2017	633.00	195.54	437.46
4/5/2017	633.00	195.55	437.45
5/3/2017	633.00	196.80	436.20
6/7/2017	633.00	197.60	435.40
7/6/2017	633.00	198.50	434.50
8/2/2017	633.00	198.82	434.18
9/6/2017	633.00	199.40	433.60
10/4/2017	633.00	199.00	434.00
11/1/2017	633.00	199.15	433.85
12/7/2017	633.00	199.95	433.05
1/10/2018	633.00	199.90	433.10
2/7/2018	633.00	199.25	433.75
3/7/2018	633.00	200.20	432.80
4/4/2018	633.00	199.00	434.00
5/2/2018	633.00	199.30	433.70
6/6/2018	633.00	199.80	433.20
7/12/2018	633.00	200.30	432.70

Chapman 7

Date Measured	Reference Elevation (ft msl)	Depth to Water (ft)	Groundwater Elevation (ft msl)
9/26/2013	639.25	341.00	298.25
10/30/2013	639.25	310.00	329.25
11/26/2013	639.25	322.00	317.25
12/19/2013	639.25	320.00	319.25
1/22/2014	639.25	295.00	344.25
2/20/2014	639.25	326.00	313.25
3/6/2014	639.25	278.00	361.25
4/2/2014	639.25	316.08	323.17
5/8/2014	639.25	286.83	352.42
6/5/2014	639.25	308.33	330.92
7/2/2014	639.25	305.51	333.74
8/7/2014	639.25	267.54	371.71
9/4/2014	639.25	270.71	368.54
10/2/2014	639.25	263.84	375.41
11/6/2014	639.25	244.00	395.25
12/4/2014	639.25	238.34	400.91
1/8/2015	639.25	275.67	363.58
2/5/2015	639.25	306.68	332.57
3/5/2015	639.25	301.73	337.52
4/2/2015	639.25	302.91	336.34
5/7/2015	639.25	303.80	335.45
6/4/2015	639.25	314.36	324.89
7/1/2015	639.25	301.80	337.45
8/6/2015	639.25	315.78	323.47
9/3/2015	639.25	285.29	353.96
10/1/2015	639.25	286.64	352.61
11/5/2015	639.25	295.10	344.15
12/3/2015	639.25	269.51	369.74
1/13/2016	639.25	283.41	355.84
2/3/2016	639.25	251.60	387.65
3/2/2016	639.25	249.00	390.25
4/6/2016	639.25	249.88	389.37
5/4/2016	639.25	258.86	380.39
6/1/2016	639.25	248.83	390.42
7/6/2016	639.25	250.70	388.55
8/3/2016	639.25	254.00	385.25
9/7/2016	639.25	256.00	383.25
10/5/2016	639.25	257.00	382.25
11/2/2016	639.25	254.00	385.25
12/7/2016	639.25	254.00	385.25
2/1/2017	639.25	259.20	380.05
3/1/2017	639.25	242.00	397.25
4/5/2017	639.25	241.50	397.75
5/3/2017	639.25	245.00	394.25
6/7/2017	639.25	246.25	393.00
7/6/2017	639.25	248.25	391.00
8/2/2017	639.25	250.00	389.25
9/6/2017	639.25	259.45	379.80
10/4/2017	639.25	251.04	388.21
11/1/2017	639.25	256.80	382.45
12/7/2017	639.25	251.60	387.65
1/10/2018	639.25	250.80	388.45
2/7/2018	639.25	247.20	392.05
3/7/2018	639.25	307.85	331.40
4/4/2018	639.25	245.50	393.75
5/2/2018	639.25	248.40	390.85
6/6/2018	639.25	250.75	388.50
7/12/2018	639.25	252.80	386.45

HISTORIC WATER LEVELS AT ARCADIA WELLS

Colorado

Date Measured	Reference Elevation (ft msl)	Depth to Water (ft)	Groundwater Elevation (ft msl)
9/26/2013	583.00	287.00	296.00
10/30/2013	583.00	265.00	318.00
11/26/2013	583.00	269.00	314.00
12/19/2013	583.00	303.00	280.00
1/22/2014	583.00	267.00	316.00
2/20/2014	583.00	304.00	279.00
3/6/2014	583.00	314.45	268.55
4/2/2014	583.00	306.56	276.44
5/8/2014	583.00	295.78	287.22
6/5/2014	583.00	284.65	298.35
7/2/2014	583.00	274.15	308.85
8/7/2014	583.00	254.79	328.21
9/4/2014	583.00	253.80	329.20
10/2/2014	583.00	249.45	333.55
11/6/2014	583.00	215.51	367.49
12/4/2014	583.00	201.14	381.86
1/8/2015	583.00	251.99	331.01
2/5/2015	583.00	297.14	285.86
3/5/2015	583.00	324.68	258.32
4/2/2015	583.00	287.32	295.68
5/7/2015	583.00	289.21	293.79
6/4/2015	583.00	311.66	271.34
7/1/2015	583.00	301.47	281.53
8/6/2015	583.00	292.01	290.99
9/3/2015	583.00	288.61	294.39
10/1/2015	583.00	269.65	313.35
11/5/2015	583.00	267.04	315.96
12/3/2015	583.00	303.77	279.23
1/13/2016	583.00	254.69	328.31
2/3/2016	583.00	290.74	292.26
3/2/2016	583.00	276.37	306.63
4/6/2016	583.00	311.11	271.89
5/4/2016	583.00	257.65	325.35
6/1/2016	583.00	280.14	302.86
7/6/2016	583.00	286.18	296.82
8/3/2016	583.00	300.09	282.91
9/7/2016	583.00	301.35	281.65
10/5/2016	583.00	285.47	297.53
11/2/2016	583.00	307.40	275.60
12/7/2016	583.00	291.40	291.60
1/4/2017	583.00	271.45	311.55
2/1/2017	583.00	276.28	306.72
3/1/2017	583.00	272.00	311.00
4/5/2017	583.00	268.20	314.80
5/3/2017	583.00	250.40	332.60
6/7/2017	583.00	241.59	341.41
7/6/2017	583.00	284.25	298.75
8/2/2017	583.00	290.23	292.77
9/6/2017	583.00	294.60	288.40
10/4/2017	583.00	280.85	302.15
11/1/2017	583.00	272.10	310.90
12/7/2017	583.00	276.70	306.30
1/10/2018	583.00	249.00	334.00
2/7/2018	583.00	260.50	322.50
3/7/2018	583.00	274.85	308.15
4/4/2018	583.00	278.75	304.25
5/2/2018	583.00	275.90	307.10
6/6/2018	583.00	279.65	303.35
7/12/2018	583.00	280.27	302.73

Hugo Reid 01

Date Measured	Reference Elevation (ft msl)	Depth to Water (ft)	Groundwater Elevation (ft msl)
9/26/2013	588.00	187.00	401.00
10/30/2013	588.00	185.00	403.00
11/26/2013	588.00	185.00	403.00
12/19/2013	588.00	183.00	405.00
1/22/2014	588.00	183.00	405.00
2/20/2014	588.00	183.00	405.00
3/6/2014	588.00	178.90	409.10
4/2/2014	588.00	183.34	404.66
5/8/2014	588.00	195.43	392.57
6/5/2014	588.00	193.37	394.63
7/2/2014	588.00	183.37	404.63
8/7/2014	588.00	179.55	408.45
9/4/2014	588.00	180.79	407.21
10/2/2014	588.00	179.27	408.73
11/6/2014	588.00	175.05	412.95
12/4/2014	588.00	173.26	414.74
1/8/2015	588.00	177.86	410.14
2/5/2015	588.00	183.76	404.24
3/5/2015	588.00	183.38	404.62
4/2/2015	588.00	185.22	402.78
5/7/2015	588.00	186.13	401.87
6/4/2015	588.00	186.91	401.09
7/1/2015	588.00	186.14	401.86
8/6/2015	588.00	185.78	402.22
9/3/2015	588.00	186.08	401.92
10/1/2015	588.00	184.37	403.63
11/5/2015	588.00	185.36	402.64
12/3/2015	588.00	181.19	406.81
1/13/2016	588.00	182.32	405.68
2/3/2016	588.00	176.50	411.50
3/2/2016	588.00	177.00	411.00
4/6/2016	588.00	178.74	409.26
5/4/2016	588.00	180.01	407.99
6/1/2016	588.00	177.97	410.03
7/6/2016	588.00	180.67	407.33
8/3/2016	588.00	181.43	406.57
9/7/2016	588.00	182.15	405.85
10/5/2016	588.00	183.03	404.97
11/2/2016	588.00	182.28	405.72
12/7/2016	588.00	182.04	405.96
1/4/2017	588.00	181.64	406.36
2/1/2017	588.00	179.84	408.16
3/1/2017	588.00	178.44	409.56
4/5/2017	588.00	179.44	408.56
5/3/2017	588.00	182.00	406.00
6/7/2017	588.00	183.24	404.76
7/6/2017	588.00	183.89	404.11
8/2/2017	588.00	184.70	403.30
9/6/2017	588.00	185.44	402.56
10/4/2017	588.00	182.88	405.12
11/1/2017	588.00	183.80	404.20
1/10/2018	588.00	184.17	403.83
2/7/2018	588.00	182.04	405.96
3/7/2018	588.00	185.64	402.36
4/4/2018	588.00	180.19	407.81
5/2/2018	588.00	181.74	406.26
6/6/2018	588.00	183.16	404.84
7/12/2018	588.00	184.04	403.96

HISTORIC WATER LEVELS AT ARCADIA WELLS

Rancho 6

Date Measured	Reference Elevation (ft msl)	Depth to Water (ft)	Groundwater Elevation (ft msl)
9/26/2013	586.80	127.00	459.80
10/30/2013	586.80	127.00	459.80
11/26/2013	586.80	127.00	459.80
12/19/2013	586.80	127.00	459.80
1/22/2014	586.80	127.00	459.80
2/20/2014	586.80	127.00	459.80
3/6/2014	586.80	126.50	460.30
4/2/2014	586.80	127.63	459.17
5/8/2014	586.80	127.66	459.14
6/5/2014	586.80	127.62	459.18
7/2/2014	586.80	127.62	459.18
8/7/2014	586.80	127.62	459.18
9/4/2014	586.80	127.63	459.17
10/2/2014	586.80	127.63	459.17
11/6/2014	586.80	127.64	459.16
12/4/2014	586.80	127.66	459.14
1/8/2015	586.80	127.66	459.14
2/5/2015	586.80	127.65	459.15
3/5/2015	586.80	127.76	459.04
4/2/2015	586.80	127.76	459.04
5/7/2015	586.80	127.79	459.01
6/4/2015	586.80	127.80	459.00
7/1/2015	586.80	127.80	459.00
8/6/2015	586.80	127.80	459.00
9/3/2015	586.80	126.72	460.08
10/1/2015	586.80	127.76	459.04
11/5/2015	586.80	127.75	459.05
12/3/2015	586.80	127.78	459.02
1/13/2016	586.80	127.77	459.03
2/3/2016	586.80	127.81	458.99
3/2/2016	586.80	127.66	459.14
4/6/2016	586.80	127.66	459.14
5/4/2016	586.80	127.69	459.11
6/1/2016	586.80	127.68	459.12
7/6/2016	586.80	127.77	459.03
8/3/2016	586.80	127.68	459.12
9/7/2016	586.80	127.68	459.12
10/5/2016	586.80	127.69	459.11
11/2/2016	586.80	127.63	459.17
12/7/2016	586.80	127.64	459.16
1/4/2017	586.80	127.65	459.15
2/1/2017	586.80	127.65	459.15
3/1/2017	586.80	127.80	459.00
4/5/2017	586.80	127.65	459.15
5/3/2017	586.80	127.65	459.15
6/7/2017	586.80	127.66	459.14
7/6/2017	586.80	127.65	459.15
8/2/2017	586.80	127.65	459.15
9/6/2017	586.80	127.64	459.16
10/4/2017	586.80	127.65	459.15
11/1/2017	586.80	127.70	459.10
12/7/2017	586.80	127.75	459.05
1/10/2018	586.80	127.70	459.10
2/7/2018	586.80	127.70	459.10
3/7/2018	586.80	127.71	459.09
4/4/2018	586.80	127.71	459.09
5/2/2018	586.80	127.72	459.08
6/6/2018	586.80	127.71	459.09
7/12/2018	586.80	127.69	459.11

Chelsea

Date Measured	Reference Elevation (ft msl)	Depth to Water (ft)	Groundwater Elevation (ft msl)
9/26/2013	562.00	124.00	438.00
10/30/2013	562.00	125.00	437.00
11/26/2013	562.00	125.00	437.00
12/19/2013	562.00	124.00	438.00
1/22/2014	562.00	125.00	437.00
2/20/2014	562.00	126.00	436.00
3/6/2014	562.00	126.44	435.56
4/2/2014	562.00	126.46	435.54
5/8/2014	562.00	126.47	435.53
6/5/2014	562.00	126.11	435.89
7/2/2014	562.00	125.81	436.19
8/7/2014	562.00	125.74	436.26
9/4/2014	562.00	125.64	436.36
10/2/2014	562.00	125.75	436.25
11/6/2014	562.00	125.61	436.39
12/4/2014	562.00	125.42	436.58
1/8/2015	562.00	124.89	437.11
2/5/2015	562.00	124.06	437.94
3/5/2015	562.00	125.31	436.69
4/2/2015	562.00	125.37	436.63
5/7/2015	562.00	125.61	436.39
6/4/2015	562.00	125.78	436.22
7/1/2015	562.00	126.04	435.96
8/6/2015	562.00	126.27	435.73
9/3/2015	562.00	125.39	436.61
10/1/2015	562.00	126.65	435.35
11/5/2015	562.00	127.10	434.90
12/3/2015	562.00	126.98	435.02
1/13/2016	562.00	127.43	434.57
2/3/2016	562.00	127.74	434.26
3/2/2016	562.00	127.74	434.26
4/6/2016	562.00	127.70	434.30
5/4/2016	562.00	127.87	434.13
6/1/2016	562.00	127.75	434.25
7/6/2016	562.00	128.11	433.89
8/3/2016	562.00	128.27	433.73
9/7/2016	562.00	128.90	433.10
10/5/2016	562.00	129.24	432.76
11/2/2016	562.00	129.50	432.50
12/7/2016	562.00	129.48	432.52
1/4/2017	562.00	129.20	432.80
2/1/2017	562.00	128.71	433.29
3/1/2017	562.00	128.87	433.13
4/5/2017	562.00	128.09	433.91
5/3/2017	562.00	127.81	434.19
6/7/2017	562.00	127.71	434.29
7/6/2017	562.00	127.70	434.30
8/2/2017	562.00	127.87	434.13
9/6/2017	562.00	128.10	433.90
10/4/2017	562.00	128.27	433.73
11/1/2017	562.00	127.87	434.13
12/7/2017	562.00	127.40	434.60
1/10/2018	562.00	126.75	435.25
2/7/2018	562.00	126.55	435.45
3/7/2018	562.00	126.25	435.75
4/4/2018	562.00	126.36	435.64
5/2/2018	562.00	126.70	435.30
6/6/2018	562.00	127.30	434.70
7/12/2018	562.00	128.07	433.93

HISTORIC WATER LEVELS AT SIERRA MADRE WELLS

Sierra Madre 3

Date Measured	Reference Elevation (ft msl)	Depth to Water (ft)	Groundwater Elevation (ft msl)
9/17/2013	707.10	369.00	338.10
10/30/2013	707.10	361.00	346.10
11/15/2013	707.10	358.00	349.10
12/15/2013	707.10	355.00	352.10
1/16/2014	707.10	354.00	353.10
2/17/2014	707.10	355.60	351.50
3/6/2014	707.10	350.23	356.87
3/21/2014	707.10	346.20	360.90
4/2/2014	707.10	345.15	361.95
5/8/2014	707.10	336.14	370.96
6/5/2014	707.10	331.27	375.83
7/2/2014	707.10	324.69	382.41
8/7/2014	707.10	328.11	378.99
9/4/2014	707.10	328.39	378.71
10/2/2014	707.10	328.34	378.76
11/6/2014	707.10	327.43	379.67
12/4/2014	707.10	323.22	383.88
1/8/2015	707.10	317.80	389.30
2/5/2015	707.10	319.08	388.02
3/5/2015	707.10	321.08	386.02
4/2/2015	707.10	325.33	381.77
5/7/2015	707.10	327.87	379.23
6/4/2015	707.10	327.06	380.04
7/1/2015	707.10	325.57	381.53
8/6/2015	707.10	325.72	381.38
9/3/2015	707.10	325.04	382.06
10/1/2015	707.10	324.37	382.73
11/5/2015	707.10	326.08	381.02
12/3/2015	707.10	324.97	382.13
1/13/2016	707.10	335.71	371.39
2/3/2016	707.10	327.65	379.45
3/2/2016	707.10	323.96	383.14
4/6/2016	707.10	323.60	383.50
5/4/2016	707.10	322.80	384.30
6/1/2016	707.10	321.47	385.63
7/6/2016	707.10	335.58	371.52
8/3/2016	707.10	340.17	366.93
9/7/2016	707.10	337.65	369.45
10/5/2016	707.10	333.84	373.26
11/2/2016	707.10	330.60	376.50
12/7/2016	707.10	324.10	383.00
1/4/2017	707.10	320.90	386.20
2/1/2017	707.10	320.65	386.45
3/1/2017	707.10	316.40	390.70
4/5/2017	707.10	314.84	392.26
5/3/2017	707.10	317.35	389.75
6/7/2017	707.10	324.63	382.47
7/6/2017	707.10	329.90	377.20
8/2/2017	707.10	336.60	370.50
9/6/2017	707.10	332.20	374.90
10/4/2017	707.10	329.33	377.77
11/1/2017	707.10	321.80	385.30
12/7/2017	707.10	319.00	388.10
1/4/2018	707.10	319.00	388.10
2/7/2018	707.10	319.80	387.30
3/7/2018	707.10	319.55	387.55
4/4/2018	707.10	319.45	387.65
5/2/2018	707.10	333.70	373.40
6/6/2018	707.10	340.15	366.95
7/12/2018	707.10	337.00	370.10

Sierra Madre 4

Date Measured	Reference Elevation (ft msl)	Depth to Water (ft)	Groundwater Elevation (ft msl)
9/17/2013	703.50	366.00	337.50
10/30/2013	703.50	359.00	344.50
11/15/2013	703.50	356.00	347.50
12/15/2013	703.50	352.00	351.50
1/16/2014	703.50	352.00	351.50
2/17/2014	703.50	353.50	350.00
3/6/2014	703.50	348.85	354.65
3/21/2014	703.50	344.20	359.30
4/2/2014	703.50	343.87	359.63

HISTORIC WATER LEVELS AT SIERRA MADRE WELLS

Sierra Madre 5

Date Measured	Reference Elevation (ft msl)	Depth to Water (ft)	Groundwater Elevation (ft msl)
9/17/2013	707.00	367.00	340.00
10/30/2013	707.00	360.00	347.00
11/15/2013	707.00	357.00	350.00
12/15/2013	707.00	355.00	352.00
1/16/2014	707.00	353.00	354.00
2/17/2014	707.00	354.50	352.50
3/6/2014	707.00	351.67	355.33
3/21/2014	707.00	345.50	361.50
4/2/2014	707.00	346.38	360.62

Sierra Madre 6

Date Measured	Reference Elevation (ft msl)	Depth to Water (ft)	Groundwater Elevation (ft msl)
9/17/2013	684.60	345.00	339.60
10/30/2013	684.60	338.00	346.60
11/15/2013	684.60	335.00	349.60
12/15/2013	684.60	334.00	350.60
1/16/2014	684.60	332.00	352.60
2/17/2014	684.60	334.10	350.50
3/6/2014	684.60	327.59	357.01
3/21/2014	684.60	323.30	361.30
4/2/2014	684.60	322.01	362.59

HISTORIC WATER LEVELS AT KINNELOA IRRIGATION DISTRICT WELLS

Shaw

Date Measured	Reference Elevation (ft msl)	Depth to Water (ft)	Groundwater Elevation (ft msl)
Apr-12	1187.50	56.70	1130.80
Oct-12	1187.50	57.80	1129.70
Apr-13	1187.50	59.20	1128.30
Oct-13	1187.50	60.90	1126.60
3/6/2014	1187.50	62.08	1125.42

Wilcox 1/

Date Measured	Reference Elevation (ft msl)	Depth to Water (ft)	Groundwater Elevation (ft msl)
04/01/12	874.90	456.20	418.70
10/01/12	874.90	450.80	424.10
04/01/13	874.90	459.40	415.50
10/01/13	874.90	463.90	411.00
3/6/2014	874.90	460.19	414.71
4/2/2014	874.90	459.18	415.72
5/8/2014	874.90	460.98	413.92
6/5/2014	874.90	462.02	412.88
7/2/2014	874.90	462.98	411.92
8/7/2014	874.90	464.24	410.66
9/4/2014	874.90	464.88	410.02
10/2/2014	874.90	464.08	410.82
11/6/2014	874.90	463.53	411.37
12/4/2014	874.90	462.86	412.04
1/8/2015	874.90	462.03	412.87
2/5/2015	874.90	461.76	413.14
3/5/2015	874.90	461.99	412.91
4/2/2015	874.90	462.35	412.55
5/7/2015	874.90	464.21	410.69
6/4/2015	874.90	465.32	409.58
7/1/2015	874.90	466.16	408.74
8/6/2015	874.90	467.62	407.28
9/3/2015	874.90	469.18	405.72
10/1/2015	874.90	469.60	405.30
11/5/2015	874.90	471.11	403.79
12/3/2015	874.90	470.76	404.14
1/13/2016	874.90	471.11	403.79
2/3/2016	874.90	471.11	403.79
3/2/2016	874.90	471.32	403.58
4/6/2016	874.90	471.47	403.43
5/4/2016	874.90	471.19	403.71
6/1/2016	874.90	471.46	403.44
7/6/2016	874.90	472.03	402.87
8/3/2016	874.90	472.78	402.12
9/7/2016	874.90	472.88	402.02
10/5/2016	874.90	473.31	401.59
11/2/2016	874.90	473.88	401.02
12/7/2016	874.90	476.50	398.40
1/4/2017	874.90	476.80	398.10
2/1/2017	874.90	476.40	398.50
3/1/2017	874.90	476.50	398.40
4/5/2017	874.90	476.07	398.83
5/3/2017	874.90	476.70	398.20
6/7/2017	874.90	477.30	397.60
7/6/2017	874.90	477.80	397.10
8/2/2017	874.90	478.63	396.27
9/6/2017	874.90	479.12	395.78
10/4/2017	874.90	479.26	395.64
11/1/2017	874.90	479.37	395.53
12/7/2017	874.90	480.38	394.52
1/4/2018	874.90	480.20	394.70
2/7/2018	874.90	480.00	394.90
3/7/2018	874.90	477.00	397.90
4/4/2018	874.90	476.75	398.15
5/2/2018	874.90	476.75	398.15
6/6/2018	874.90	477.00	397.90
7/12/2018	874.90	477.25	397.65

NOTES:
1/ Depth to water measurements collected for SMAART Program from 03/06/14 to 11/02/16 adjusted according to DWR semi-annual readings starting from April 2014.