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Innovative Strategies for Environmental and Natural Resource Management

Memorandum

To: Eric Cherniss, Panoche Valley Solar LLC (PVS)

From: Dan Matthews, Jill Haizlip

Date: revised December 15, 2014

Re: Memorandum
Panoche Valley Solar Project
Groundwater Extraction Impact Evaluation
Panoche Valley, CA

1 INTRODUCTION

This memorandum summarizes the results of GEOLOGICA's evaluation of hydrogeological issues associated with proposed groundwater extraction for the Panoche Valley Solar Project. GEOLOGICA completed this evaluation for Panoche Valley Solar LLC (PVS) in general accordance with our proposal dated April 29, 2014. This memorandum presents the results of our analysis of: 1) the potential for the Panoche Valley aquifer and existing on-site wells to support project water needs; 2) the potential impacts to the aquifer of groundwater extraction for the project; and, 3) recommendations for additional investigation of the aquifer or specific wells or groundwater monitoring as appropriate. **Figure 1** shows the site location and approximate water supply well locations.

2 BACKGROUND

The proposal for this work was prepared following a teleconference call on April 25, 2014 with the PVS project team to discuss potential groundwater usage and project schedule for the Panoche Valley Solar Project. The project proponents have proposed using existing on-site groundwater wells to supply water for: 1) construction; 2) annual cleaning of solar panels; 3) ongoing operation and maintenance shop needs; and 4) fire suppression. In an email received on April 9, 2014, PVS estimated project water usage at approximately 800,000 gallons per day (gpd) for the estimated construction (item 1, above) period from May 2015 through October 2016 (18 months), inclusive.

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During the period following construction (items 2-4, above), PVS estimated that water use would decrease significantly. Water usage at the initial estimated rate of approximately 800,000 gpd for 18 months would be significantly higher than was estimated for the first five years of the original Panoche Valley Solar Project as discussed in the Hydrogeologic Study Report[1] completed for the 2010 Environmental Impact Report (EIR) for the project. Consequently, the impacts of project water usage could be greater than expected based on the analysis presented in the EIR. In addition, due to the higher estimated usage, the capacity of wells on the property to supply higher projected water needs was unknown. GEOLOGICA recommended that PVS attempt to refine their estimated water needs and conduct an evaluation of the revised project potential groundwater impacts.

Sections below describe the results of our evaluation of the capacity of the aquifer and water supply wells on the property to provide water for the project, potential impacts of water production, and recommended additional work. In addition to office data analyses described below, GEOLOGICA conducted a site visit on May 16, 2014 to measure water levels in wells on the subject property in order to evaluate changes in site conditions relative to the previous work.

On December 10, 2014, GEOLOGICA received updated water usage information from PVS and updated this memorandum to reflect changes to the assumptions included in the July 30, 2014 version of this memorandum. Updated information included an increase in acreage estimated for mass grading and excavation from 271 acres to 392 acres and an increase in maximum acreage of disturbed land per day from 400 acres to 550 acres. PVS also clarified that the construction schedule currently proposed an 18-month construction period for ground disturbing activities that had the potential to generate fugitive dust as opposed to the previously assumed 24 month schedule. However, some construction activities, such as electrical wiring, panel installation or other non-ground disturbing activities may continue longer than this 18-month period.

3 May 2014 Water Level Measurements

A GEOLOGICA staff scientist visited the site on May 16, 2014 and measured depth to water in 17 wells on the property. Water level measurements are summarized in **Table 1**. Reference point elevations were determined from the topographic survey map of the property provided by PVS and/or state Department of Water Resources (DWR) records to enable calculation of groundwater elevation. In addition to measuring water levels in wells on the property, GEOLOGICA accessed a water level database maintained by the state DWR to obtain water level data for wells on the

[1] Final Environmental Impact Report (EIR), Panoche Valley Solar Farm Project, CUP No. UP 1023-09, State Clearinghouse No. 2010031008, prepared for County of San Benito, Department of Planning and Building Inspection Services, Hollister, CA 95023, by Aspen Environmental Group, September 2010. Appendix 6A, Hydrologic Study. http://www.cosb.us/Solargen/feir.htm

property and in other locations in Panoche Valley. A summary of the water level data obtained from the DWR database is presented in **Table 2**.

A review of DWR water level measurement records did not identify a uniform trend or pattern of water level change across the valley. Based on DWR records, water level elevations in a number of wells in Panoche Valley including wells 0, 1, 2, 4, 7, 9, 11, 17, 18, 19 and others, declined over the last five years. This decline is presumably due to drought conditions in California in the last few years. However, water levels in some of the wells were relatively stable while water levels in other wells over the same time period fluctuated several feet presumably from intermittent pumping for stock watering, irrigation, or domestic use. Water levels measured by GEOLOGICA and data from the state water level database were used to prepare a groundwater elevation contour map for Spring 2014, which is shown on **Figure 2**. Generally groundwater flows southeasterly toward the narrows at the east end of Panoche Valley. Large apparent water level differences between nearby wells, for example between well 29 (groundwater elevation of 1,059 feet) and well 30 (groundwater elevation of 1,137 feet) are believed to be due to differences in use. Well 30 is located at an abandoned house and does not appear to be in use. Well 29 is apparently pumped to supply water for a chicken raising operation. Generally lower groundwater gradients were observed in 2014 compared to 2010 reflecting reduced groundwater recharge in the last few years.

4 Water Supply Capacity Evaluation

4.1 Estimated Water Usage

GEOLOGICA received an initial spreadsheet detailing estimates of the quantity of water needed and potential frequency or duration of use from PVS via email on May 9, 2014. After reviewing the results of our initial groundwater evaluation with PVS in a teleconference call, GEOLOGICA received a spreadsheet with revised water use calculations on June 4, 2014. GEOLOGICA had further discussion via email with PVS on June 6, 2014 to clarify the anticipated construction-related groundwater usage and construction schedule. GEOLOGICA received revised information from PVS on December 10, 2014 via a telephone conference and email. The use of the resulting revised water usage schedule to assess potential groundwater impacts is discussed in Section 4.2.

The May 9, 2014 water usage calculation spreadsheet and the June 4, 2014 revision detail four scenarios for the construction schedule for the project, each with different water consumption schedules depending primarily on assumptions regarding the amount of earthwork that can be conducted in a day and associated water needs for dust control. The PVS water usage calculation indicates that groundwater will be needed during project construction and long-term operation as follows:

- Mass Excavation & Grading – PVS estimated that water will be needed for dust control during mass excavation & grading operations at a maximum rate of 47,457 gallons per acre of land disturbed (using 35 – 50 gallons per cubic yard to meet moisture content necessary for proper compaction), with a total of approximately 392 acres disturbed during construction. The 47,457 gallons per acre needed for mass grading and excavation is based on the total amount of water needed for each acre during the entire mass grading and excavation period; not the daily water needed for each acre. PVS advised that a maximum of 2,000 gpd would be needed for mass grading and excavation per acre. The rate at which water would need to be produced for this purpose depends on the construction rate expressed as the number of acres of land disturbed per day. PVS estimated that the minimum construction rate is approximately 2 acres per day, allowed under more restrictive development requirements, with a maximum of approximately 50 acres per day with no restrictions imposed on acreage disturbed per day. This yields a maximum daily usage of 100,000 gallons per day and the total water need for this purpose is approximately 18,600,000 gallons. Depending on the amount of water needed and the speed at which construction can be completed, PVS estimated that mass excavation & grading would be completed in as little as 2 months or as much as 6 months. If the work is completed in six months then continuous production of groundwater would be needed at a rate of approximately 103,000 gpd. In addition, PVS would like to fill the construction storage ponds within the first 10 days of construction requiring a higher pumping rate of 450,000 gpd for 10 days. With this initial peak in usage, the continuous pumping rate to support this purpose would be approximately 77,742 gpd for 6 months. If the work takes less than 6 months, groundwater would be extracted continuously at a lower rate since the maximum peak daily usage of 100,000 gpd would not change.

- Dust Control – PVS estimated that water will be needed for dust control during PV system construction at an approximate rate of 875 gallons per acre of land disturbed, with a total of approximately 550 acres disturbed during a typical work day (maximum water usage of 481,250 gpd). Dust control would be needed to control fugitive emissions in staging areas, along transportation corridors, as well as in areas that have been disturbed and have not be stabilized (e.g. crust formed, straw mulch applied, hydroseeded, or other form of stabilization method employed). The total water needed for this purpose depends on the assumed duration of construction activities. Typical daily construction water usage during the first year is estimated at 350,000 gpd. To evaluate potential water needs conservatively, we assumed that PV system construction could be completed in approximately 18 months. Assuming 52 weeks per year with 5 day work week and water use of 350,000 gallons per work day, this would entail a continuous (24/7) groundwater extraction rate of 230,137 gpd. However, water usage is not anticipated to remain at 350,000 gallons for the entire 18-month construction period. Rather water usage is anticipated to decrease during the last six months of construction to an average of 190,000 gpd and a continuous rate of extraction of 125,274 gpd. This yields a total water usage of approximately 106,800,000 gallons of water for this purpose during construction.

- Long-Term Operation – PVS estimated ongoing water needs after completion of the PV system to be approximately 30 gallons per day (gpd) per employee or 450 gpd for 15 full time employees or approximately 112,500 gallons per year (gpy) assuming 50 weeks per year with 5 day work week and 450 gallons per work day. Water would also be needed for panel washing at a rate of approximately 812,000 gpy for two panel washing episodes (assuming 0.5 gallons of water per panel). These ongoing water needs yield a fixed continuous groundwater extraction rate of approximately 2,533 gpd or approximately 1.75 gallons per minute (gpm) following PV system construction.

Based on recent discussions with PVS regarding the construction duration, the following review of the estimated water needs and potential impacts of groundwater extraction considers an 18-month construction period to be the most representative scenario to evaluate for assessment of potential impacts to the Panoche Valley aquifer. With respect to assessing the capacity of the water supply well(s) selected for the project, the selected water supply well(s) would need to be able produce up to 450,000gpd (313 gpm) for 10 days. Our evaluation of existing water supply well capacity is discussed in Section 4.2 below. Continued groundwater extraction for dust control and long-term operation will draw the water table down, which tends to reduce well yield. Consequently, an evaluation is needed to assess impacts of pumping on the capacity of selected wells to supply the project itself as well as potential off-site impacts. Our revised evaluation of potential impacts of project-related groundwater extraction (using the revised usage schedule) is discussed in Section 5.

4.2 Available Well Data

Available well data for the property and Panoche Valley are detailed in Appendix 6B of the Panoche Valley EIR and summarized in **Table 3**. The capacity of a well to produce water for project needs depends on several factors including:

- The current condition of the well. Corroded, blocked, or damaged screen may limit water entry. The presence of old pump equipment in the well including riser pipe, pump bowls or other equipment could prevent placement of a new pump.

- Well diameter. A pump capable of producing up to 500 gpm would need a well casing with a minimum diameter of approximately 8 inches for effective use.

- Aquifer properties. Placement of screen across laterally extensive intervals of sand and/or gravel is generally required to produce water at the rates anticipated for the project. In addition, unconsolidated soil with high storativity or specific yield favors greater well yield. The presence of geographic or geologic limits to the producing interval can increase drawdown and limit well yield.

- Available drawdown. Due to friction losses and other factors, groundwater extraction produces the greatest amount of drawdown (water level decline) in the pumped well itself. Electric pumps are water cooled and require a minimum of ten to fifteen feet of standing water above the pump body for cooling purposes. Consequently, a well used to supply the project needs to be completed far enough below the water table that drawdown from pumping will not draw the water table below the pump for the life of the project.

In addition, wells centrally located on the subject property are preferred to wells on the edge of the property or off the property to minimize pipeline construction needs and to minimize propagation of drawdown impacts off the property.

As listed in **Table 3**, limited information is available for most of the wells on the property. Two wells on the property, well 4 and well 20, are likely capable of supplying sufficient water to meet project needs either individually or in combination. A third well, well 19, may also be capable of supplying water for the project.

- Well 4 was completed in 1976 with 14-inch diameter screen set to a depth of 422 feet below ground surface (ft bgs). The log for the well indicates that the well screen spans permeable sand and gravel zones. The current condition of the well screen is unknown. The current depth to water in the well is approximately 47 feet indicating that the well has approximately 375 feet of available water column. No yield data are available for this well.

- Well 20 was completed in 1976 with 16-inch diameter screen set to a depth of 360 ft bgs. The log for the well indicates that the well screen spans permeable sand and gravel zones. Testing by the driller yielded 1,400 gpm with 240 feet of drawdown. The current condition of the well screen is unknown. The current depth to water in the well is approximately 29 feet indicating that the well has approximately 331 feet of available water column.

- Well 19 was completed in 1967 with 12-inch diameter screen set to a depth of 168 ft bgs. The current depth to water in the well is approximately 72 feet indicating that the well has approximately 96 feet of available water column. The well produced approximately 560 gpm with 60 feet of drawdown during the 3-1/2 day pumping test conducted for the 2010 Hydrogeologic Study Report. The relatively shallow depth of the well compared to wells 4 and 20 may limit the utility of this well for producing water long term as the water table may draw down to below safe limits for pump operation as pumping continues.

- Based on well depth and casing diameter well 0 and well 21 may be capable of supplying water for the project. They are shallower than wells 4 and 20; as a result, if these wells were utilized, production might need to be split between several wells to assure production for the duration of construction. We understand that PVS would like to use well 0 for supplying long-term operation needs after construction. The well is currently being used for stock watering and would likely be adequate for producing water for panel washing and personnel needs.

Little information is available to evaluate the potential utility of using wells 3, 17, 18, 22, 43, or 44 on the property. The depth to water in wells 17 and 18 was approximately 71 feet in May 2014. Our records indicate the wells are only approximately 100 feet deep, consequently they appear to have limited available water column (on the order of 30 feet) to support sustained pumping. If it is desired to use these wells due to their proximity to planned construction areas, we recommend engaging a driller to log the wells using a down hole camera to identify screened intervals and to conduct pumping capacity tests to develop current data on well yield.

5 Potential Impacts of Groundwater Extraction

Based on the information summarized in preceding sections, GEOLOGICA developed a groundwater extraction scenario to assess potential impacts of project-related groundwater extraction on the aquifer that incorporates the projected variable duration and intensity of water usage expected during and following project construction. For this evaluation, "impact" was evaluated in terms of the amount of water level decline (drawdown) resulting from pumping. Excessive water level drawdown could reduce well yields or increase the amount of energy required to bring water to the surface for use and thus constitute an "impact". After completion of construction, the groundwater impact evaluation assumes continued groundwater extraction at a significantly lower rate to provide water for on-site workers and panel washing.

The use of analytical expressions for estimating drawdown resulting from pumping conducted for this project is unlikely to be accurate for this situation because the aquifer is physically bounded by no-flow boundaries around the perimeter of the valley's water shed, which would likely result in greater drawdown than predicted by an analytical expression. Also, the planned project pumping rate is not constant.

5.1 Numerical Evaluation

Due to the inherent limitations in applying analytical expressions for estimating drawdown, GEOLOGICA conducted a limited numerical modeling exercise using the USGS MODFLOW model, which is described below. A summary of current understanding of hydrogeologic conditions in Panoche Valley was presented in the Hydrogeologic Study completed for the 2010 draft EIR[2]. Little information is available regarding the depth or lateral extent of groundwater bearing zones in the valley, the distribution of hydraulic properties including transmissivity and storativity in the valley are largely unknown, and the hydrologic budget for the valley is imprecisely known, which are important input parameters for groundwater modeling. Consequently, the numerical modeling results presented here should be considered preliminary, subject to verification by testing or monitoring during construction of the PV system. Despite uncertainties, the use of a numerical model allows consideration of time-varying pumping rates and boundary conditions related to the geography of the valley aquifer.

For this evaluation, a finite difference numerical model consisting of one layer, 84 columns and 40 rows was constructed. No flow boundaries were assigned on the north, south, and west to roughly mimic the geographical extent of the Panoche Valley aquifer based on the watershed limits shown on **Figure 1**. A constant head boundary set to an elevation of 925 ft was specified for active model cells on the eastern edge of the model grid. Based on the water budget presented in the 2010 Hydrogeologic Study Report, precipitation recharge was specified at an average rate of 1 inch per year over the active portion of the model grid. This resulted in groundwater outflow from the eastern edge of the model grid at a rate of approximately 2,900 acre-ft per year, which is approximately equal to the groundwater outflow from the eastern end of the valley estimated in the 2010 Hydrogeologic Study Report.

5.1.1 Evaluation Methods

Two groundwater model simulation runs were conducted to evaluate impacts related to groundwater extraction for project construction and post-construction O&M needs. One run was conducted using the average transmissivity of 6,000 ft^2/day and average storage coefficient value of 0.03 termed the "high estimated storage coefficient simulation". A second run was conducted using the lowest storage coefficient value (0.008) estimated from the 2010 pumping test, which was termed the "low storage coefficient simulation". For these simulations, groundwater extraction was specified from well 4 at the following rates during construction:

Purpose of Water Use	Construction Period	Number of Days	Extraction Rate (gpd)	Total (gallons)
Filling storage ponds	First 10 days	10	450,000	4,500,000
Mass grading & Excavation	Months 1-6	182	307,609	55,984,931
Dust control	Months 7-12	182	230,137	41,884,931
Dust control	Months 13-18	182	125,275	22,800,000
Total	**18 months**	**556**	**--**	**125,169,862**

[2] Panoche Valley Solar Farm Project EIR, Appendix 6B, Water Supply Assessment.

Following the 18 month construction period, groundwater extraction for O&M needs was specified at a rate of 2,533 gpd for the remainder of the simulation duration of 5 years.

5.1.2 Simulation Results

In both cases (high and low storage coefficient), the maximum drawdown is predicted to occur approximately 12 months after the start of pumping with greater drawdown near the pumped well and less drawdown with increasing distance from the pumped well. Greater drawdown was predicted for simulations where the lower storage coefficient value (0.008) was assumed for the pumping scenario. Predicted maximum drawdown values for the two scenarios are summarized in **Table 4**.

- <u>Results</u> – For the simulation using the higher estimated storage coefficient (0.03), the maximum drawdown is predicted to occur approximately 12 months after pumping begins. The predicted maximum drawdown is approximately 1.2 feet near wells 14 and 16 on the southern property line, and approximately 0.45 feet near well 27, which serves the organic farm southeast of the property, and slightly over 3 feet near the pumped well. Repeating the simulation using the lower storage coefficient value (0.008) reported for the pumping test, yielded greater estimated drawdown of approximately 2.7 feet near wells 14 and 16 beside Yturiate Road and 1.5 feet near well 27. The maximum drawdown near the pumped well was predicted by this scenario to be approximately 5 feet.

The Panoche Valley aquifer has limited areal extent. Consequently, the model simulation predicts that self-interference arising from the reflection of the drawdown “cone” off of the edges of the basin increases the drawdown observed near the extraction well and delays the time until the maximum drawdown is observed. In this case, the model simulations predict that the maximum drawdown will be observed approximately 12 months after start of pumping, thereafter, the amount of drawdown observed is predicted to decrease step-wise as the aquifer recovers from the initial period of higher extraction and the extraction rate is incrementally decreased. The aquifer will begin full recovery when construction-related extraction is terminated.

The subsurface extent of the Panoche Valley aquifer and hydraulic properties of the aquifer are uncertain. Consequently, the actual time until the maximum drawdown is observed near the extraction well may be more or less than 12 months and the amount of water level drawdown may be greater or less than predicted. Depending on the amount of rainfall recharge to the aquifer during and following construction, water levels in the aquifer will recover to pre-construction levels over roughly the same time span as water table drawdown developed during construction.

Due to uncertainties in aquifer parameters and particularly in future rainfall recharge rates; the amount of time required for complete recovery is uncertain but will likely take several years.

6 Discussion and Recommendations

Project-related groundwater extraction is expected to occur in two distinct phases comprising an initial phase of relatively high intensity extraction to support construction-related dust control for 18 months followed by a second phase of low intensity extraction to supply water for panel washing and plant personnel needs for the length of the project. After construction begins, water table drawdown is expected to increase with time, reaching a maximum approximately 12 months after pumping begins. After completing construction of the PV system, project related groundwater extraction will decrease dramatically. Water table recovery will begin as soon as the groundwater extraction rate decreases, and is expected to recover to pre-construction levels within a few years after completing construction. The greatest amount of water table drawdown will occur in and near the well(s) pumped to meet project needs with progressively less drawdown with increasing distance from the pumped well(s). Based on our analysis, we estimate that groundwater extraction during the construction phase could result in maximum drawdown of 3 feet near the southern edge of the property and 1 to 2 feet at locations farther off-site at the end of construction, assuming an 18-month construction duration. These drawdown effects will be transient and this analysis suggests that the water table will begin to recover as soon as construction ends. The drawdown will most likely dissipate over roughly the same time period as it developed during construction.

Because of the relatively small volume of water needed for long-term operation, groundwater usage after completion of the PV system is unlikely to have significant impact on groundwater levels in the valley.

As discussed in Section 3, water levels in the water supply wells in the valley have a history of fluctuating several feet, likely as a result of intermittent pumping and/or seasonal changes in rainfall recharge (more in the winter and less in the summer). As a result, the predicted drawdown levels during the construction phase and long-term operation are unlikely to significantly impair existing water supply well use in the valley and may be difficult to distinguish from natural variations.

Specific Recommendations include:

- As noted in Section 4.2, the current condition of wells on the property is largely unknown. We recommend engaging a pump or well drilling contractor to conduct step rate pumping tests in wells 4 and 20 to assess their current condition and viability for meeting project needs. The contractor should also conduct video surveys on existing wells that lack well screen information in accordance with the requirements of EIR Mitigation Measure WR-1.2[3]. We also recommend having the contractor inspect well 0 to assess the condition of the pump, casing, electrical supply, etc. for long-term operation needs.

- As required by EIR Mitigation Measure WR-1.2, we recommend preparing a Plan for Aquifer Testing and Well Interference Analysis for submittal to San Benito County describing the (also required) 72-hour pumping test to evaluate aquifer properties and evaluate possible interference with nearby wells, after conducting the preliminary tests and inspections noted above.

- Conduct the required aquifer test 14 days after submitting the Plan and submit the aquifer test results and well interference analysis to San Benito County for their review and approval.

- After completing these analyses and reviewing the aquifer test and interference analysis results with the County, we recommend preparing a Groundwater Monitoring and Reporting Plan for review by the County in accordance with the requirements of EIR Mitigation Measure WR-1.1. The Groundwater Monitoring and Reporting Plan will include provisions for continuously recording the groundwater extraction rate using a flow totalizer and periodic measurement of water levels in wells on the property to provide early warning of an unexpected response to pumping.

7 Limitations

The hydrologic evaluation conducted to assess potential impacts of project-related groundwater extraction was based on limited available information regarding the physical extent and hydraulic properties of the Panoche Valley aquifer. Consequently, while every effort has been made to utilize conservative estimates of relevant aquifer parameters, the results presented here should be considered preliminary. Data from the aquifer test required for EIR Mitigation Measure WR-1.2 should be used to further assess the accuracy of the analysis discussed in this memo. As discussed in Section 6, the data collection required for EIR Mitigation Measure WR-1.1 will provide additional information to assess the validity of the simulation predictions presented in this memo after pumping begins to facilitate making adjustments to the proposed pumping schedule to mitigate drawdown effects at off-site locations as needed.

[3] Panoche Valley Solar Farm Project EIR, Section C.15 Water Resources, Environmental Impacts and Mitigation Measures.

Attachments:

Table 1 – May 2014 Groundwater Level Measurements
Table 2 – DWR Water Level Measurement Database Summary
Table 3 – Well Data Summary
Table 4 – Summary of Groundwater Extraction Simulation Results

Figure 1 – Spring 2014 Groundwater Elevation Contour Map
Figure 2 – Predicted Maximum Project-Related Groundwater Drawdown

Table 1
Groundwater Extraction Impact Evaluation
Panoche Valley Solar Project, Panoche Valley, California

May 2014 Groundwater Level Measurements

Geologica Well Number	State DWR Well ID Number	Ground Surface Elevation	Measured Depth to Groundwater(1)	Reference Point Stickup above Ground Surface	Depth to Groundwater from Ground Surface	Groundwater Elevation
		ft MSL	ft	ft	ft	ft MSL
0	15S10E16A001M	1323	73(1)	1	72	1,251(2)
4	15S10E10P002M	1300	46.9	0.4	46.5	1,254
5	15S10E13N001M	1256(3)	49.25	4	45.25	1,211
7	15S10E17R001M	1358	60	1	59	1,299
10	15S10E21C001M	1338	181.1	0.5	180.6	1,157
14	15S10E22D003M	1300	51	0.5	50.5	1,250
15	15S10E22D004M	1300	56.8	0.5	56.3	1,244
16	15S10E22D002M	1300	55.1	0.5	54.6	1,245
17	15S10E04R001M	1330	71.8	0.6	71.2	1,259
18	15S10E03N001M	1320	72.65	1.15	71.5	1,249
19	15S10E10P001M	1300	62.2	0.4	61.8	1,238
20	15S10E15F001M	1304	30.7	2	28.7	1,275
22	15S10E15L001M	1293	>47	-	-	-
23	15S10E23B001M	1246	40.8	0.3	40.5	1,206
24	15S10E13N001M	1256(3)	52.9	3	49.9	1,206
44	-	1381	118.7(1)	0.7	118	1,263(2)
45	-	1286	53.65	0.15	53.5	1,233

Notes:
1) Depth to water measured from top of well casing, base plate, or standpipe.
2) Well pump running at time of measurement.
3) Approximate ground surface elevation from topographic map provided by AMEC.
4) - = Well not monitored by State Department of Water Resources.
5) >47 = Blockage encountered at 47 feet below ground surface.

Table 2
Groundwater Extraction Impact Evaluation
Panoche Valley Solar Project, Panoche Valley, California

DWR Water Level Measurement Database Summary

State DWR Well ID Number	Well latitude	Well longitude	Geologica Well Number	Measurement Date	Measured Depth to Groundwater ft	Groundwater Elevation ft MSL
15S10E16A001M	36.629200	-120.880400	0	4/8/2004	64.4	1261.7
15S10E16A001M	36.629200	-120.880400	0	4/27/2006	65.8	1260.3
15S10E16A001M	36.629200	-120.880400	0	4/27/2007	66.8	1259.3
15S10E16A001M	36.629200	-120.880400	0	4/21/2009	68.7	1257.4
15S10E16A001M	36.629200	-120.880400	0	3/29/2012	70.9	1255.2
15S10E16A001M	36.629200	-120.880400	0	4/22/2013	73.2	1252.9
15S10E16A001M	36.629200	-120.880400	0	3/20/2014	73.5	1252.6
15S10E19H001M	36.609700	-120.916300	1	4/8/2004	33.9	1389.3
15S10E19H001M	36.609700	-120.916300	1	4/27/2006	30.7	1392.5
15S10E19H001M	36.609700	-120.916300	1	4/27/2007	32.4	1390.8
15S10E19H001M	36.609700	-120.916300	1	4/21/2009	34.7	1388.5
15S10E19H001M	36.609700	-120.916300	1	3/29/2012	33.4	1389.8
15S10E19H001M	36.609700	-120.916300	1	4/22/2013	34.3	1388.9
15S10E19H001M	36.609700	-120.916300	1	3/20/2014	39.8	1383.4
15S10E14N001M	36.617500	-120.858200	2	4/8/2004	29.0	1249.1
15S10E14N001M	36.617500	-120.858200	2	4/27/2005	31.0	1247.1
15S10E14N001M	36.617500	-120.858200	2	4/27/2006	28.8	1249.3
15S10E14N001M	36.617500	-120.858200	2	4/21/2009	30.6	1247.5
15S10E14N001M	36.617500	-120.858200	2	3/29/2012	30.4	1247.7
15S10E14N001M	36.617500	-120.858200	2	4/22/2013	30.8	1247.3
15S10E15G001M	36.626400	-120.866300	3	4/8/2004	48.0	1237.1
15S10E15G001M	36.626400	-120.866300	3	4/27/2007	49.7	1235.4
15S10E15G001M	36.626400	-120.866300	3	4/21/2009	50.2	1234.9
15S10E15G001M	36.626400	-120.866300	3	3/29/2012	50.3	1234.8
15S10E15G001M	36.626400	-120.866300	3	4/22/2013	38.7	1246.4
15S10E15G001M	36.626400	-120.866300	3	3/20/2014	56.9	1228.2
15S10E10P002M	36.631900	-120.871000	4	4/8/2004	42.7	1260.4
15S10E10P002M	36.631900	-120.871000	4	4/27/2006	43.5	1259.6
15S10E10P002M	36.631900	-120.871000	4	4/27/2007	43.6	1259.5
15S10E10P002M	36.631900	-120.871000	4	4/21/2009	47.7	1255.4
15S10E10P002M	36.631900	-120.871000	4	3/29/2012	46.1	1257.0
15S10E10P002M	36.631900	-120.871000	4	4/22/2013	46.3	1256.8
15S10E10P002M	36.631900	-120.871000	4	3/20/2014	50.8	1252.3
15S10E20D001M	36.614400	-120.912100	6	4/8/2004	31.7	1366.5
15S10E20D001M	36.614400	-120.912100	6	4/27/2006	29.1	1369.1
15S10E20D001M	36.614400	-120.912100	6	4/21/2009	29.0	1369.2
15S10E20D001M	36.614400	-120.912100	6	3/29/2012	28.9	1369.2
15S10E20D001M	36.614400	-120.912100	6	4/22/2013	29.5	1368.7
15S10E17R001M	36.616700	-120.896800	7	4/8/2004	51.8	1309.4
15S10E17R001M	36.616700	-120.896800	7	4/27/2005	47.0	1314.2
15S10E17R001M	36.616700	-120.896800	7	4/27/2006	56.8	1304.4
15S10E17R001M	36.616700	-120.896800	7	4/27/2007	54.9	1306.3
15S10E17R001M	36.616700	-120.896800	7	4/21/2009	54.5	1306.7
15S10E17R001M	36.616700	-120.896800	7	3/29/2012	56.8	1304.4
15S10E17R001M	36.616700	-120.896800	7	4/22/2013	56.3	1304.9
15S10E17R001M	36.616700	-120.896800	7	3/20/2014	67.9	1293.3
15S10E17R002M	36.617200	-120.894600	8	4/8/2004	50.2	1305.0
15S10E17R002M	36.617200	-120.894600	8	4/27/2005	44.8	1310.4
15S10E17R002M	36.617200	-120.894600	8	4/27/2006	44.2	1311.0
15S10E17R002M	36.617200	-120.894600	8	4/27/2007	50.3	1304.9
15S10E17R002M	36.617200	-120.894600	8	4/21/2009	53.1	1302.1
15S10E17R002M	36.617200	-120.894600	8	3/29/2012	56.1	1299.1
15S10E17R002M	36.617200	-120.894600	8	4/22/2013	58.4	1296.8
15S10E17R002M	36.617200	-120.894600	8	3/20/2014	58.4	1296.8
15S10E20H001M	36.612500	-120.894600	9	4/8/2004	35.4	1317.8
15S10E20H001M	36.612500	-120.894600	9	4/27/2005	36.7	1316.5
15S10E20H001M	36.612500	-120.894600	9	4/27/2006	35.1	1318.1
15S10E20H001M	36.612500	-120.894600	9	4/27/2007	34.9	1318.3

Table 2
Groundwater Extraction Impact Evaluation
Panoche Valley Solar Project, Panoche Valley, California

DWR Water Level Measurement Database Summary

State DWR Well ID Number	Well latitude	Well longitude	Geologica Well Number	Measurement Date	Measured Depth to Groundwater ft	Groundwater Elevation ft MSL
15S10E20H001M	36.612500	-120.894600	9	4/21/2009	37.8	1315.4
15S10E20H001M	36.612500	-120.894600	9	3/29/2012	42.8	1310.4
15S10E20H001M	36.612500	-120.894600	9	4/22/2013	43.1	1310.1
15S10E20H001M	36.612500	-120.894600	9	3/20/2014	44.9	1308.3
15S10E21C001M	36.616100	-120.888500	10	4/8/2004	219.3	1121.9
15S10E21C001M	36.616100	-120.888500	10	4/27/2005	204.0	1137.2
15S10E21C001M	36.616100	-120.888500	10	4/27/2006	191.0	1150.2
15S10E21C001M	36.616100	-120.888500	10	4/27/2007	185.6	1155.6
15S10E21C001M	36.616100	-120.888500	10	4/21/2009	166.6	1174.6
15S10E21C001M	36.616100	-120.888500	10	3/29/2012	246.7	1094.5
15S10E21C001M	36.616100	-120.888500	10	4/22/2013	206.3	1134.9
15S10E21C001M	36.616100	-120.888500	10	3/20/2014	185.9	1155.3
15S10E21G001M	36.612500	-120.884600	11	4/8/2004	56.5	1286.7
15S10E21G001M	36.612500	-120.884600	11	4/27/2005	57.8	1285.4
15S10E21G001M	36.612500	-120.884600	11	4/27/2007	57.0	1286.2
15S10E21G001M	36.612500	-120.884600	11	4/21/2009	58.7	1284.5
15S10E21G001M	36.612500	-120.884600	11	3/29/2012	62.2	1281.0
15S10E21G001M	36.612500	-120.884600	11	4/22/2013	62.9	1280.3
15S10E21G001M	36.612500	-120.884600	11	3/20/2014	66.2	1277.0
15S10E21J001M	36.607200	-120.878200	12	4/8/2004	78.8	1249.4
15S10E21J001M	36.607200	-120.878200	12	4/27/2007	78.5	1249.7
15S10E21J001M	36.607200	-120.878200	12	4/21/2009	81.8	1246.4
15S10E21J001M	36.607200	-120.878200	12	3/29/2012	77.8	1250.4
15S10E21J001M	36.607200	-120.878200	12	3/20/2014	83.9	1244.3
15S10E22Q001M	36.605600	-120.863500	13	4/8/2004	52.5	1223.6
15S10E22Q001M	36.605600	-120.863500	13	4/27/2006	52.6	1223.5
15S10E22Q001M	36.605600	-120.863500	13	4/21/2009	52.0	1224.1
15S10E22Q001M	36.605600	-120.863500	13	3/29/2012	52.1	1224.0
15S10E22Q001M	36.605600	-120.863500	13	4/22/2013	52.3	1223.8
15S10E22Q001M	36.605600	-120.863500	13	3/20/2014	53.1	1223.0
15S10E22D003M	36.616900	-120.875400	14	4/8/2004	49.1	1254.0
15S10E22D003M	36.616900	-120.875400	14	4/27/2005	48.9	1254.2
15S10E22D003M	36.616900	-120.875400	14	4/27/2006	48.8	1254.3
15S10E22D003M	36.616900	-120.875400	14	4/27/2007	48.2	1254.9
15S10E22D003M	36.616900	-120.875400	14	4/21/2009	48.8	1254.3
15S10E22D003M	36.616900	-120.875400	14	3/29/2012	49.8	1253.3
15S10E22D003M	36.616900	-120.875400	14	4/22/2013	50.4	1252.7
15S10E22D003M	36.616900	-120.875400	14	3/20/2014	50.9	1252.2
15S10E22D004M	36.616100	-120.872100	15	4/8/2004	68.1	1235.0
15S10E22D004M	36.616100	-120.872100	15	4/27/2005	65.0	1238.1
15S10E22D004M	36.616100	-120.872100	15	4/27/2006	63.6	1239.5
15S10E22D004M	36.616100	-120.872100	15	4/27/2007	60.0	1243.1
15S10E22D004M	36.616100	-120.872100	15	4/21/2009	57.2	1245.9
15S10E22D004M	36.616100	-120.872100	15	3/29/2012	53.8	1250.3
15S10E22D004M	36.616100	-120.872100	15	4/22/2013	53.9	1249.2
15S10E22D004M	36.616100	-120.872100	15	3/20/2014	54.7	1248.4
15S10E22D002M	36.616700	-120.872700	16	4/8/2004	53.8	1249.3
15S10E22D002M	36.616700	-120.872700	16	4/27/2005	55.2	1247.9
15S10E22D002M	36.616700	-120.872700	16	4/27/2006	53.5	1249.6
15S10E22D002M	36.616700	-120.872700	16	4/27/2007	53.8	1249.3
15S10E22D002M	36.616700	-120.872700	16	4/21/2009	54.6	1248.5
15S10E22D002M	36.616700	-120.872700	16	3/29/2012	53.1	1250.0
15S10E22D002M	36.616700	-120.872700	16	4/22/2013	55.9	1247.2
15S10E22D002M	36.616700	-120.872700	16	3/20/2014	56.8	1246.3
15S10E04R001M	36.648900	-120.877400	17	4/8/2004	59.0	1274.1
15S10E04R001M	36.648900	-120.877400	17	4/27/2006	62.3	1270.8
15S10E04R001M	36.648900	-120.877400	17	4/27/2007	64.9	1268.2
15S10E04R001M	36.648900	-120.877400	17	4/21/2009	69.3	1263.8

Table 2
Groundwater Extraction Impact Evaluation
Panoche Valley Solar Project, Panoche Valley, California

DWR Water Level Measurement Database Summary

State DWR Well ID Number	Well latitude	Well longitude	Geologica Well Number	Measurement Date	Measured Depth to Groundwater ft	Groundwater Elevation ft MSL
15S10E04R001M	36.648900	-120.877400	17	3/29/2012	70.2	1262.9
15S10E04R001M	36.648900	-120.877400	17	4/22/2013	71.5	1261.6
15S10E04R001M	36.648900	-120.877400	17	3/20/2014	71.1	1262.0
15S10E03N001M	36.646400	-120.875700	18	4/8/2004	61.6	1261.5
15S10E03N001M	36.646400	-120.875700	18	4/27/2006	63.6	1259.5
15S10E03N001M	36.646400	-120.875700	18	4/27/2007	64.7	1258.4
15S10E03N001M	36.646400	-120.875700	18	4/21/2009	67.3	1255.8
15S10E03N001M	36.646400	-120.875700	18	3/29/2012	70.8	1252.3
15S10E03N001M	36.646400	-120.875700	18	4/22/2013	71.7	1251.4
15S10E03N001M	36.646400	-120.875700	18	3/20/2014	72.7	1250.4
15S10E10P001M	36.632200	-120.871600	19	4/8/2004	57.8	1245.3
15S10E10P001M	36.632200	-120.871600	19	4/27/2006	54.2	1248.9
15S10E10P001M	36.632200	-120.871600	19	4/27/2007	55.2	1247.9
15S10E10P001M	36.632200	-120.871600	19	4/21/2009	63.2	1239.9
15S10E10P001M	36.632200	-120.871600	19	3/29/2012	60.3	1242.8
15S10E10P001M	36.632200	-120.871600	19	4/22/2013	61.1	1242.0
15S10E10P001M	36.632200	-120.871600	19	3/20/2014	62.1	1241.0
15S10E15F001M	36.627800	-120.872400	20	4/8/2004	38.9	1268.2
15S10E15F001M	36.627800	-120.872400	20	4/27/2007	28.5	1278.6
15S10E15F001M	36.627800	-120.872400	20	4/21/2009	32.6	1274.5
15S10E15F001M	36.627800	-120.872400	20	3/29/2012	33.7	1273.4
15S10E15F001M	36.627800	-120.872400	20	4/22/2013	35.9	1271.2
15S10E15F001M	36.627800	-120.872400	20	3/20/2014	39.8	1267.3
15S10E15G002M	36.625800	-120.862900	21	4/8/2004	40.2	1244.9
15S10E15G002M	36.625800	-120.862900	21	4/27/2007	35.6	1249.5
15S10E15G002M	36.625800	-120.862900	21	4/21/2009	38.9	1246.2
15S10E15G002M	36.625800	-120.862900	21	3/29/2012	39.4	1245.7
15S10E15G002M	36.625800	-120.862900	21	4/22/2013	54.9	1230.2
15S10E15G002M	36.625800	-120.862900	21	3/20/2014	42.9	1242.2
15S10E15L001M	36.621400	-120.870400	22	4/8/2004	47.0	1249.1
15S10E15L001M	36.621400	-120.870400	22	4/27/2005	50.0	1246.1
15S10E15L001M	36.621400	-120.870400	22	4/27/2006	47.1	1249.0
15S10E15L001M	36.621400	-120.870400	22	4/27/2007	58.3	1237.8
15S10E15L001M	36.621400	-120.870400	22	4/21/2009	58.9	1237.2
15S10E15L001M	36.621400	-120.870400	22	4/22/2013	59.3	1236.8
15S10E15L001M	36.621400	-120.870400	22	3/20/2014	60.2	1235.9
15S10E23B001M	36.616900	-120.847700	23	4/8/2004	38.4	1210.7
15S10E23B001M	36.616900	-120.847700	23	4/27/2005	44.6	1204.5
15S10E23B001M	36.616900	-120.847700	23	4/27/2006	37.7	1211.4
15S10E23B001M	36.616900	-120.847700	23	4/27/2007	39.0	1210.1
15S10E23B001M	36.616900	-120.847700	23	4/21/2009	39.3	1209.8
15S10E23B001M	36.616900	-120.847700	23	3/29/2012	39.9	1209.2
15S10E23B001M	36.616900	-120.847700	23	4/22/2013	52.7	1196.4
15S10E23B001M	36.616900	-120.847700	23	3/20/2014	40.4	1208.7
15S10E13N001M	36.617800	-120.839100	24	4/8/2004	46.2	1256.9
15S10E13N001M	36.617800	-120.839100	24	4/27/2005	46.0	1257.1
15S10E13N001M	36.617800	-120.839100	24	4/27/2006	51.1	1252.0
15S10E13N001M	36.617800	-120.839100	24	4/27/2007	66.7	1236.4
15S10E13N001M	36.617800	-120.839100	24	4/21/2009	47.3	1255.8
15S10E24F001M	36.613100	-120.832100	25	4/8/2004	205.1	1043.0
15S10E24F001M	36.613100	-120.832100	25	4/27/2005	208.0	1040.1
15S10E24F001M	36.613100	-120.832100	25	4/27/2006	202.0	1046.1
15S10E24F001M	36.613100	-120.832100	25	4/27/2007	234.8	1013.3
15S10E24F001M	36.613100	-120.832100	25	4/21/2009	235.4	1012.7
15S10E24F001M	36.613100	-120.832100	25	3/29/2012	234.7	1013.4
15S10E24F001M	36.613100	-120.832100	25	4/23/2013	206.0	1042.1
15S10E24F001M	36.613100	-120.832100	25	3/20/2014	202.0	1046.1
15S10E24N002M	36.605300	-120.840400	26	4/8/2004	79.9	1163.2

Table 2
Groundwater Extraction Impact Evaluation
Panoche Valley Solar Project, Panoche Valley, California

DWR Water Level Measurement Database Summary

State DWR Well ID Number	Well latitude	Well longitude	Geologica Well Number	Measurement Date	Measured Depth to Groundwater ft	Groundwater Elevation ft MSL
15S10E24N002M	36.605300	-120.840400	26	4/27/2005	78.6	1164.5
15S10E24N002M	36.605300	-120.840400	26	4/27/2006	78.3	1164.8
15S10E24N002M	36.605300	-120.840400	26	4/27/2007	141.8	1101.3
15S10E24N002M	36.605300	-120.840400	26	4/21/2009	85.2	1157.9
15S10E24N002M	36.605300	-120.840400	26	3/27/2012	84.6	1158.5
15S10E24N002M	36.605300	-120.840400	26	3/20/2014	88.3	1154.8
15S10E24N003M	36.603600	-120.839900	27	4/8/2004	89.4	1153.7
15S10E24N003M	36.603600	-120.839900	27	4/27/2005	89.3	1153.8
15S10E24N003M	36.603600	-120.839900	27	4/27/2006	87.0	1156.1
15S10E24N003M	36.603600	-120.839900	27	4/27/2007	86.0	1157.1
15S10E24N003M	36.603600	-120.839900	27	4/21/2009	86.7	1156.4
15S10E24N003M	36.603600	-120.839900	27	3/27/2012	85.4	1157.7
15S11E30C001M	36.600800	-120.813200	28	4/8/2004	82.0	1131.1
15S11E30C001M	36.600800	-120.813200	28	4/21/2009	78.0	1135.1
15S11E30E002M	36.597800	-120.819300	29	4/8/2004	131.6	1062.5
15S11E30E002M	36.597800	-120.819300	29	4/27/2005	140.0	1054.1
15S11E30E002M	36.597800	-120.819300	29	4/27/2006	138.0	1056.1
15S11E30E002M	36.597800	-120.819300	29	4/27/2007	139.0	1055.1
15S11E30E002M	36.597800	-120.819300	29	4/21/2009	135.0	1059.1
15S11E30E002M	36.597800	-120.819300	29	3/27/2012	134.5	1059.6
15S11E30E002M	36.597800	-120.819300	29	4/23/2013	135.1	1059.0
15S11E30E002M	36.597800	-120.819300	29	3/19/2014	133.6	1060.5
15S11E30M001M	36.595000	-120.819900	30	4/8/2004	50.6	1136.5
15S11E30M001M	36.595000	-120.819900	30	4/27/2005	51.4	1135.7
15S11E30M001M	36.595000	-120.819900	30	4/27/2006	48.7	1138.4
15S11E30M001M	36.595000	-120.819900	30	4/21/2009	51.0	1136.1
15S11E30M001M	36.595000	-120.819900	30	3/27/2012	49.4	1137.7
15S11E30F001M	36.597200	-120.811600	31	4/8/2004	65.0	1128.1
15S11E30F001M	36.597200	-120.811600	31	4/27/2006	62.0	1131.1
15S11E30F001M	36.597200	-120.811600	31	4/21/2009	64.1	1129.0
15S11E30K001M	36.593100	-120.805700	32	4/8/2004	61.7	1118.4
15S11E30K001M	36.593100	-120.805700	32	4/27/2005	58.7	1121.4
15S11E30K001M	36.593100	-120.805700	32	4/27/2007	68.9	1111.2
15S11E30K001M	36.593100	-120.805700	32	4/21/2009	57.7	1122.4
15S11E30K001M	36.593100	-120.805700	32	3/27/2012	58.7	1121.4
15S11E30K001M	36.593100	-120.805700	32	4/23/2013	65.7	1114.4
15S11E30K001M	36.593100	-120.805700	32	3/19/2014	68.7	1111.4
15S11E30R001M	36.590600	-120.798800	33	4/8/2004	38.5	1124.6
15S11E30R001M	36.590600	-120.798800	33	4/27/2005	37.6	1125.5
15S11E30R001M	36.590600	-120.798800	33	4/27/2007	35.9	1127.2
15S11E30R001M	36.590600	-120.798800	33	4/21/2009	38.2	1124.9
15S11E30R001M	36.590600	-120.798800	33	3/27/2012	35.7	1127.4
15S11E30R001M	36.590600	-120.798800	33	4/23/2013	34.2	1128.9
15S11E30R001M	36.590600	-120.798800	33	3/19/2014	33.1	1130.0
15S11E29E001M	36.596100	-120.795400	34	4/8/2004	65.7	1117.4
15S11E29E001M	36.596100	-120.795400	34	4/27/2005	63.2	1119.9
15S11E29E001M	36.596100	-120.795400	34	4/27/2006	61.3	1121.8
15S11E29E001M	36.596100	-120.795400	34	4/27/2007	59.7	1123.4
15S11E29E001M	36.596100	-120.795400	34	4/21/2009	59.8	1123.3
15S11E29E001M	36.596100	-120.795400	34	3/27/2012	58.7	1124.4
15S11E29E001M	36.596100	-120.795400	34	4/23/2013	60.2	1122.9
15S11E29E001M	36.596100	-120.795400	34	3/20/2014	60.8	1122.3
15S11E29J001M	36.594700	-120.784900	35	4/8/2004	82.6	1060.5
15S11E29J001M	36.594700	-120.784900	35	4/27/2005	87.1	1056.0
15S11E29J001M	36.594700	-120.784900	35	4/27/2006	63.8	1079.3
15S11E29J001M	36.594700	-120.784900	35	4/27/2007	36.0	1107.1
15S11E29J001M	36.594700	-120.784900	35	4/21/2009	22.0	1121.1
15S11E32A001M	36.587800	-120.782900	36	4/8/2004	55.1	1059.0

Table 2
Groundwater Extraction Impact Evaluation
Panoche Valley Solar Project, Panoche Valley, California

DWR Water Level Measurement Database Summary

State DWR Well ID Number	Well latitude	Well longitude	Geologica Well Number	Measurement Date	Measured Depth to Groundwater ft	Groundwater Elevation ft MSL
15S11E32A001M	36.587800	-120.782900	36	4/27/2005	74.0	1040.1
15S11E32A001M	36.587800	-120.782900	36	4/27/2006	65.6	1048.5
15S11E32A001M	36.587800	-120.782900	36	4/27/2007	76.8	1037.3
15S11E32A001M	36.587800	-120.782900	36	4/21/2009	51.8	1062.3
15S11E32A001M	36.587800	-120.782900	36	3/27/2012	49.4	1064.7
15S11E32A001M	36.587800	-120.782900	36	4/23/2013	54.1	1060.0
15S11E32A001M	36.587800	-120.782900	36	3/19/2014	48.8	1065.3
15S10E24N001M	36.603300	-120.836000	40	4/8/2004	74.8	1153.3
15S10E24N001M	36.603300	-120.836000	40	4/27/2005	76.0	1152.1
15S10E24N001M	36.603300	-120.836000	40	4/27/2006	74.0	1154.1
15S10E24N001M	36.603300	-120.836000	40	4/27/2007	74.7	1153.4
15S10E24N001M	36.603300	-120.836000	40	3/27/2012	69.8	1158.3
15S10E24N001M	36.603300	-120.836000	40	3/20/2014	75.8	1152.3
15S10E25J001M	36.592500	-120.833500	41	4/8/2004	62.4	1110.7
15S10E25J001M	36.592500	-120.833500	41	3/27/2012	52.6	1120.5
15S10E25J001M	36.592500	-120.833500	41	4/23/2013	52.9	1120.2
15S10E25J001M	36.592500	-120.833500	41	3/20/2014	52.9	1120.2
15S10E25J002M	36.593100	-120.833800	46	4/8/2004	59.8	1143.3
15S10E25J002M	36.593100	-120.833800	46	4/27/2005	58.6	1144.5
15S10E25J002M	36.593100	-120.833800	46	4/27/2006	57.7	1145.4
15S10E25J002M	36.593100	-120.833800	46	4/27/2007	57.9	1145.2
15S10E25J002M	36.593100	-120.833800	46	4/21/2009	59.0	1144.1
15S10E25J002M	36.593100	-120.833800	46	3/27/2012	58.3	1144.8
15S10E25J002M	36.593100	-120.833800	46	4/23/2013	59.0	1144.1
15S10E25J002M	36.593100	-120.833800	46	3/20/2014	59.6	1143.5
15S11E30E003M	36.597200	-120.819300	47	4/8/2004	52.7	1141.4
15S11E30E003M	36.597200	-120.819300	47	4/27/2005	51.5	1142.6
15S11E30E003M	36.597200	-120.819300	47	4/27/2006	56.2	1137.9
15S11E30E003M	36.597200	-120.819300	47	4/27/2007	51.2	1142.9
15S11E30E003M	36.597200	-120.819300	47	4/21/2009	53.6	1140.5
15S11E30E003M	36.597200	-120.819300	47	3/27/2012	52.9	1141.2
15S11E30E003M	36.597200	-120.819300	47	4/23/2013	53.4	1140.7
15S11E30M002M	36.595000	-120.816600	48	4/8/2004	47.5	1140.6
15S11E30M002M	36.595000	-120.816600	48	4/27/2005	51.1	1137.0
15S11E30M002M	36.595000	-120.816600	48	4/27/2007	53.2	1134.9
15S11E28R001M	36.588100	-120.766800	49	4/8/2004	28.9	1014.2
15S11E28R001M	36.588100	-120.766800	49	4/27/2005	35.5	1007.6
15S11E28R001M	36.588100	-120.766800	49	4/27/2006	33.0	1010.1
15S11E28R001M	36.588100	-120.766800	49	4/27/2007	33.1	1010.0
15S11E28R001M	36.588100	-120.766800	49	4/21/2009	32.5	1010.6
15S11E28R001M	36.588100	-120.766800	49	3/27/2012	31.2	1011.9
15S11E28R001M	36.588100	-120.766800	49	4/23/2013	30.9	1012.2
15S11E28R001M	36.588100	-120.766800	49	3/20/2014	31.1	1012.0
15S09E24C001M	36.616100	-120.950700	50	4/8/2004	32.2	1490.0
15S09E24C001M	36.616100	-120.950700	50	4/27/2006	28.2	1494.0
15S09E24C001M	36.616100	-120.950700	50	4/27/2007	29.5	1492.7
15S09E24C001M	36.616100	-120.950700	50	4/21/2009	37.3	1484.9
15S09E24C001M	36.616100	-120.950700	50	3/29/2012	36.9	1485.3
15S09E24C001M	36.616100	-120.950700	50	4/22/2013	37.9	1484.3
15S09E24C001M	36.616100	-120.950700	50	3/20/2014	35.7	1486.5

Source: http://www.water.ca.gov/waterdatalibrary/groundwater/index_new.cfm

Table 3
Groundwater Extraction Impact Evaluation
Panoche Valley Solar Project, Panoche Valley, California

Well Data Summary

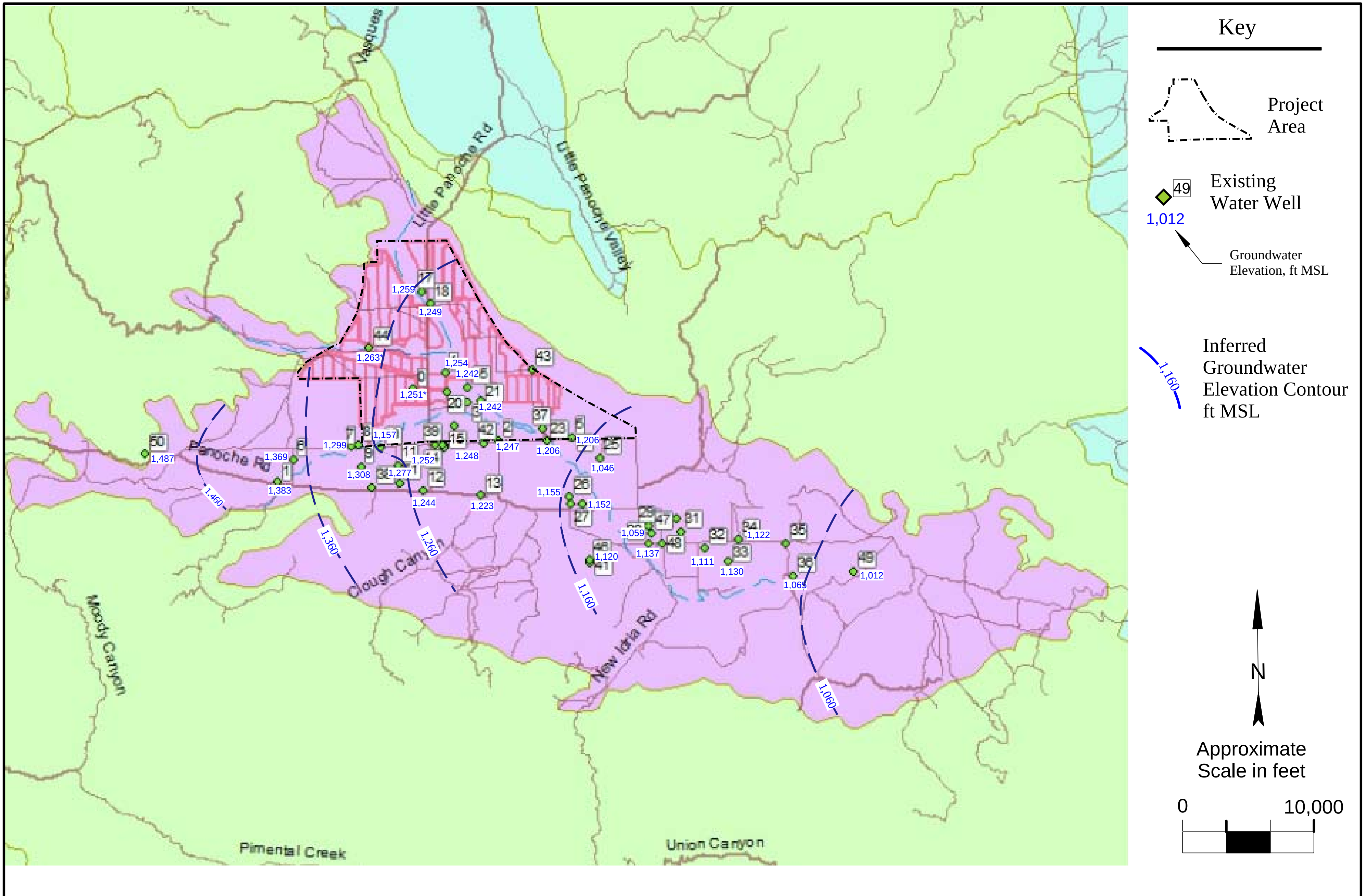
Geologica Well Number	State DWR Well ID Number	Projection	Datum	Easting	Northing	Units	Zone	Parcel #	TD (ft)	Casing Diam (in)	Casing Depth (ft)	Casing Perforation Intervals	Depth to Water (ft) (at drilling)	year	Test Pumping gal/min	Draw Down, ft	Pumping Duration, Hours	Stratigraphy (Y/N)
17	15S10E04R001M	UTM	NAD27	689832	4057823	metres	10	272600050	90+	24			87	Aug-73				N
		LL	NAD27	120.8764	36.6489	dec. deg.												
18	15S10E03N001M	UTM	NAD27	689988	4057548	metres	10	272700010	90+	12			89.5	Nov-67				N
		LL	NAD27	120.8747	36.6464	dec. deg.												
4	15S10E10P002M	UTM	NAD27	690446	4055950	metres	10	272700080	600	14	422	182-422	86	Nov-76				Y
		LL	NAD27	120.87	36.6319	dec. deg.												
19	15S10E10P001M	UTM	NAD27	690396	4055984	metres	10	272900010	168+	12	168	90-168	98.2	Nov-67	560	60	84	N
		LL	NAD27	120.8706	36.6322	dec. deg.												
0	15S10E16A001M	UTM	NAD27	689608	4055628	metres	10	272800040	322			58-300	88	Aug-76				Y
		LL	NAD27	120.8794	36.6292	dec. deg.												
20	15S10E15F001M	UTM	NAD27	690332	4055490	metres	10	272900010	550	16	380	90-120	82	Nov-76	1400	240	16	Y
		LL	NAD27	120.8714	36.6278	dec. deg.						280-360						
10	15S10E21C001M	UTM	NAD27	688920	4054162	metres	10	272800080	1000+						1000			N
		LL	NAD27	120.8875	36.6161	dec. deg.												
3	15S10E15G001M	UTM	NAD27	690882	4055348	metres	10	272900010	150	12								N
		LL	NAD27	120.8653	36.6264	dec. deg.												
21	15S10E15G002M	UTM	NAD27	691185	4055289	metres	10	272900010	262	16	262		77	Nov-76				N
		LL	NAD27	120.8619	36.6258	dec. deg.												
22	15S10E15L001M	UTM	NAD27	690526	4054786	metres	10	272900020	86+				86					Y
		LL	NAD27	120.8694	36.6214	dec. deg.												
37	15S10E14Q001M	UTM	NAD27	692658	4054678	metres	10	272900040	1330	8								Y
		LL	NAD27	120.8456	36.62	dec. deg.												
24	15S10E13N001M	UTM	NAD27	693334	4054449	metres	10	272900060										N
		LL	NAD27	120.8381	36.6178	dec. deg.												

Source: Final Environmental Impact Report (EIR), Panoche Valley Solar Farm Project, CUP No. UP 1023-09, State Clearinghouse No. 2010031008, prepared for County of San Benito, Department of Planning and Building Inspection Services, Hollister, CA 95023, by Aspen Environmental Group, September 2010. Appendix 6A, Hydrologic Study. http://www.cosb.us/Solargen/feir.htm

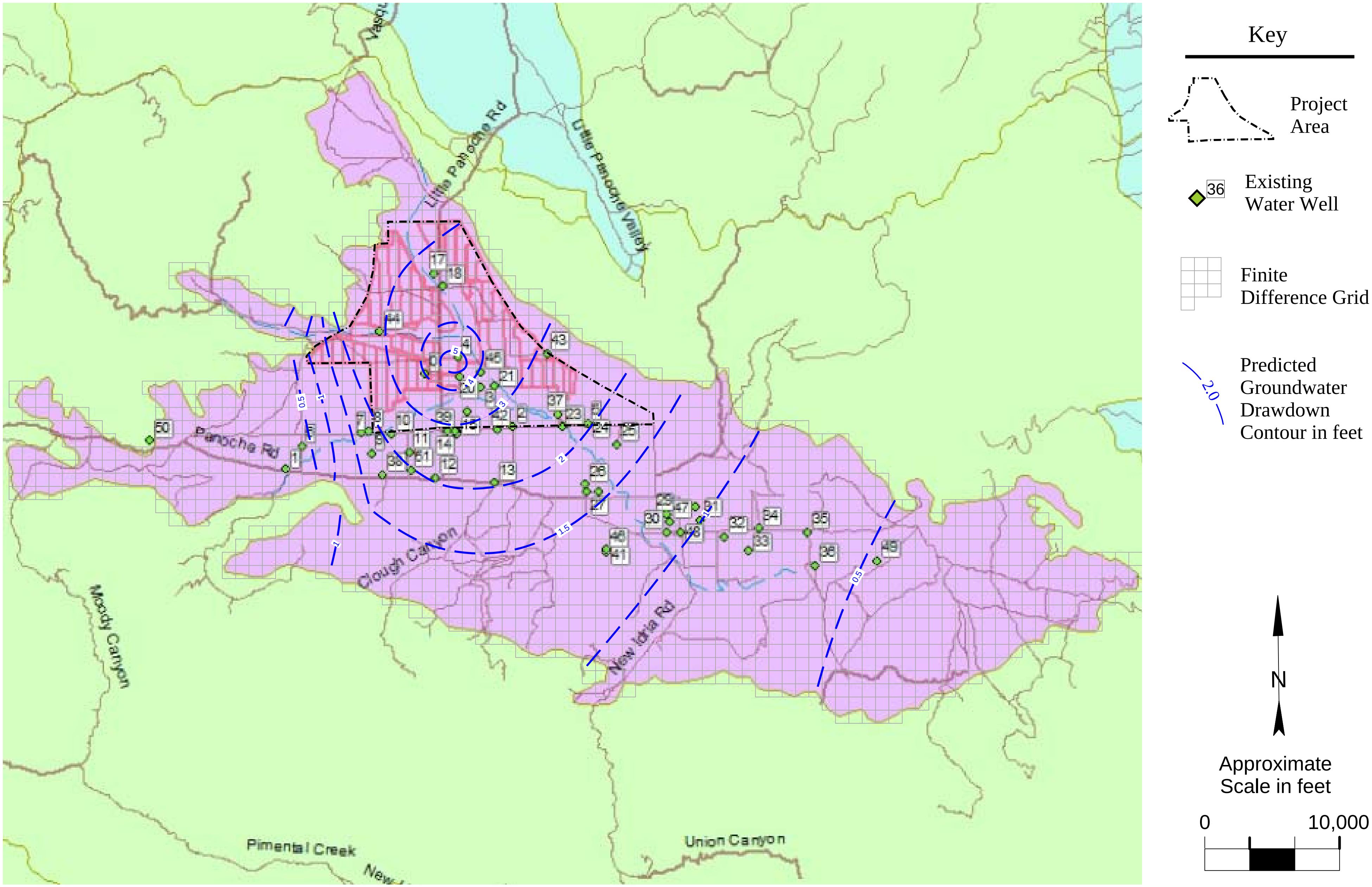
Table 4
Groundwater Extraction Impact Evaluation
Panoche Valley Solar Project, Panoche Valley, California

Summary of Groundwater Extraction Simulation Results

Pumping Rate Schedule		Storage Coefficient used in Simulation	Predicted Time of Maximum Drawdown, days	Drawdown near Pumped Well, feet	Drawdown near Off-Site Wells 14 & 16, feet	Drawdown near Off-Site Well 27, feet
High Estimated Storage Coefficient Simulation						
0 - 10 days	450,000 gpd	0.03	365	3.2	1.2	0.45
10 - 182 days	307,609 gpd					
182 - 365 days	230,137 gpd					
365 - 548 days	125,275 gpd					
thereafter	2,533 gpd					
Low Estimated Storage Coefficient Simulation						
0 - 10 days	450,000 gpd	0.008	365	5	2.7	1.5
10 - 182 days	307,609 gpd					
182 - 365 days	230,137 gpd					
365 - 548 days	125,275 gpd					
thereafter	2,533 gpd					



geologica	Groundwater Extraction Impact Evaluation	Figure 1
San Francisco, California	Panoche Valley Solar Project Panoche Valley, California	Spring 2014 Groundwater Elevation Contour Map



geologica	**Groundwater Extraction Impact Evaluation** Panoche Valley Solar Project Panoche Valley, California	**Figure 2**
San Francisco, California		**Predicted Maximum Project-Related Groundwater Drawdown**