Data Request 101:

Please clarify the extent of the evaluation of offsite wells located north and east across the Cantil Fault to reflect the actual information collected in that area during the pumping test and the statistical support for the applicant's conclusions regarding the hydrogeologic conditions in that area.

Response:

Please see response to Data Request No. 98 submitted on October 13, wherein figures were revised to show the extent of information gathered at the end of the pumping tests for Well Nos. 43, 48 and 63. These figures were annotated with the water level information at the end of the test which is summarized in Table 5.17-5, provided in response to Data Request No. 99 submitted on October 13.

Beacon Solar did not have access to water supply wells east of the fault. Therefore, Beacon Solar reached the conclusion that water supply wells east of the fault were not likely affected during each of the pumping tests based upon existing data from previous investigations, distance to these wells and observations of drawdown during the pumping test. The conclusion was drawn from:

- Historical data and mapping that interpreted the fault is a barrier to groundwater flow (see response to Data Request No. 102 below and Figures DR-102a through DR-102d). These figures clearly show differences in head and response to pumping on either side of the fault zone as interpreted by Koehler 1977.

- The drawdown in observation wells in the direction of the Cantil Fault (i.e., Well No. 44 during pumping of Well No. 63 and the USGS well and pumping of Well No. 43) showing more drawdown relative to the other observation wells (see revised Figures 5.17-7, 5.17-8 and 5.17-9 as provided in Data Response No. 98 submitted on October 13). This difference in drawdown is either due to contrasting conductivity in a direction southeast of Well No. 63 and southwest of Well No. 43 or a physical barrier, such as a fault. It is not coincidental that during the pumping of both of these wells drawdown was exaggerated in the direction of the fault, indicating this feature is impedes to groundwater flow.

- The distance to the offsite water supply wells is between about 5,000 feet and 13,100 feet from the pumping wells. The drawdown observed in the observation wells during the test, coupled with the distance to these wells, would suggest that during a short term test (72-hours) it would not be anticipated that there be any measureable drawdown at these distances.

- Lastly, it is important to note that the model calibration supported observations and conclusions reached by the USGS (Koehn 1977). That is the conductance of the Cantil Valley Fault was a sensitive parameter in model calibration and a better calibration resulted from having the fault in the model as a barrier to groundwater flow (please see Data Request No. 115 below).

In summary, the distance to the offsite water supply wells being between about 5,000 and 13,100 feet from the pumping wells, and the presence of a groundwater barrier as interpreted by others and as indicated by the drawdown data led to the conclusion that the offsite water supply wells were not affected during the test.

Data Request 102:

Please revise and provide to staff the figures pertinent to this data request to reflect the information collected during the site specific tests. Where the interpretation uses assumptions based on previous investigators' basin-wide evaluations, please identify those assumptions separately.

Response:

Please see figures 5.17-7, 5.17-8 and 5.17-9 submitted on October 13 in response to Data Request No. 98 that were revised and annotated to show the cone of depression at the end of the pumping tests. Please also see the above response to Data Request No. 101 as the rationale for why the Cantil Fault is being interpreted as a groundwater barrier. The following is a summary of the rationale for the Cantil Fault as a barrier to groundwater flow from historic studies on the Koehn Sub-basin.

Koehler (1977) states on page 10, "Cantil Valley fault acts as a barrier to groundwater movement". The key figures in Koehler (1977) are Figure 3 (thickness of sediments) (Figure DR-102a, attached), Figure 4 (water levels for 1958) (Figure DR-102b, attached), Figure 5 (water level for 1976) (Figure DR-102c, attached), and especially Figure 6 (water level decline 1958-1976) (Figure DR-102d, attached).

- Sediment Thickness Patterns: Figure DR-102a (sediment thickness) shows that the thickness patterns for the alluvial sediments are much different on the north side of the Cantil Fault than on the south side. On the north side of the fault, the thickness of the sediments increases from around 500 feet near the Garlock Fault to around 800 feet near the Cantil Fault. On the south side of the Cantil Fault, the sediment thickness increases from southwest to northeast toward Koehn Lake, showing no relationship to the Cantil Fault. This pattern of sediment thickness is opposite that found on the north side of the Cantil Fault, suggesting influence of depositional patterns and juxtaposition along the Cantil Fault.

- Figure DR-102b (water levels for 1958). This map of water levels shows that groundwater southwest of Koehn Lake flows from southwest to northeast up the valley toward Koehn Lake. Northeast of Koehn Lake, groundwater flows down the valley from northeast to southwest toward Koehn Lake. The groundwater level contours have an offset across the Cantil Fault that averages about 20 feet, with the water levels being lower on the south side of the Cantil Fault. This offset is not apparent across the Cantil Fault northeast of Koehn Lake.

- Figure DR-102c (water levels for 1976) shows the same pattern, with flow southwest of Koehn Lake now going to the areas of intense pumping both north and south of the Cantil Fault. The water level offset across the Cantil Fault is still around 20 feet, with the water levels south of the fault now being about 20 feet higher on average than north of the fault. In the area of section 2, T31S, R37E and section 34, T30S, R37E, (the areas of most intense pumping) there is an offset in the water levels of at least 20 feet with the closely-spaced contours drawn south of the Cantil Fault stopping at the fault and not crossing the fault to the north side of the valley. This suggests that water level data in the agricultural wells for 1976, as interpreted by Koehler (1977), showed a definite influence of the Cantil Fault.

- Finally, Figure DR-102d (water level decline 1958-1976) shows a definite difference of about 100 feet in groundwater decline across the Cantil Fault, with water level declines in the main area of pumping (Sec 2, T31S, R37E) south of the Cantil Fault being 200 to 240 feet and those in the main area of pumping on the north side of the fault (Sec 34, T30S, R37E) being only 120 feet. This figure shows, without a doubt, that the Cantil Fault is a substantial barrier to groundwater flow. Groundwater flows parallel to the Cantil Fault, but not across the fault.

Data Request 103:

Please explain how hydrographs collected from wells located on both sides of the Cantil Fault are similar, given the assumption that the fault is a barrier to groundwater movement.

Response:

Figure DR-103 shows hydrographs for selected wells that are on the west and east side of the Cantil Fault (i.e., either side of the fault). These wells are a subset of the wells that have the most groundwater elevation data for the period between about 1958 and 2007. The hydrographs for 24 wells in the Koehn Sub-basin were provided in Appendix J-1 of the AFC. Figure DR-103 shows some of the wells within this group to provide a contrast showing hydrographs on either side of the Cantil Fault.

As shown on Figure DR-103, some of the hydrographs are similar and some are not. Hydrographs reflect changes in groundwater level over time. Since they are a measure of water level change over time, they reflect variation in local recharge and discharge (i.e., local water supply well pumping in this case). The similarity of some hydrographs does not indicate that the Cantil Fault is not a barrier to groundwater flow. Rather, a differential in hydraulic head across the fault is a better indication of a barrier condition. This aspect can be seen in Figures DR-102b, DR-102c and DR-102d as provided in the response to Data Request No. 102 above. These figures illustrate how local pumping centers created significant differences in hydraulic head across the Cantil Fault, which is a definite indication that groundwater flow across the fault is impeded.

Although some hydrographs show a similar rebound pattern, this similarity reflects the storage parameters of the aquifer sediments, and similar conditions of recharge and discharge locally in a post-agricultural pumping environment. The similarity should not be interpreted that the fault is not a barrier to groundwater flow as historic data has shown otherwise.

Data Request 106:

> Please provide a map showing locations of the model calibration targets (the well locations reported in Table 4.2).

Response:

The requested figure showing the model calibration targets is provided as Figure DR-106, as well as the model prediction for 1958 water levels.

Data Request 107:

> Please provide a map that overlays and compares observed (Figure 3.2) and simulated (Figure 4.6) 1958 groundwater level contours. Figure 4.6 is titled “observed vs. simulated 1958”, but there is only one set of contours and the figure does not identify which set is shown (i.e., observed or simulated).

Response:

Figure 4.6 in AFC Appendix J.2 was mislabled. The figure shows the calibrated water level contours for 1958. Figure DR-107 shows the observed water levels for 1958 (Figure 3.2 or DR-102b, attached) in comparison to the predicted water levels from the groundwater model for 1958 (Figure 4.6).

Data Request 108:

Please provide a map that overlays and compares observed (Figure 3.4) and simulated 1976 groundwater level contours.

Response:

Attached is Figure DR-108, showing the observed (Appendix J.2 Figure 3.4) water levels for 1976 and the predicted water levels from the groundwater model.

Data Request 109:

Please provide a map that overlays and compares observed (Figure 5.17-3) and simulated 2007 groundwater level contours.

Response:

Attached is Figure DR-109, showing the observed water levels for 2007 and the predicted water levels from the groundwater model for 2007.

Data Request 112:

Please provide documentation of the specific data sources and calculations used to develop all simulated volumetric water budget components specified in the groundwater model.

Response:

Koehler (1977) estimated the water balance for the Koehn Lake Basin for the period from about 1960 to 1976. He estimated that about 9,500 acre-feet per year (AFY) flowed up the valley toward Koehn Lake from the southwest, using the estimated of transmissivity from Moyle (1969) and the gradients measured for 1958 (Moyle 1969), and for 1976. He estimated runoff recharge to be around 200 AFY and rounded the total recharge to the valley to about 10,000 AFY. Koehler (1977) never specified where the groundwater flowing up Koehn Basin from the southwest originated.

Koehler (1977) then estimated discharge using crop consumption estimates and acreages in production. He estimated discharge of 18,000 AFY to 28,000 AFY from 1960 to 1966 with an average of 20,000 AFY, annually. From 1968 to 1976, Koehler (1977) estimated a discharge of 35,000 to 60,000 AFY with an average of 40,000 AFY, annually. For the whole period from 1960

to 1976, Koehler (1977) estimated discharge as averaging 32,000 AFY. During this period water consumption by crops was estimated northeast of Koehn Lake at 248 AFY in 1965 and 2,232 AFY in 1975, with a spike to 6,200 AFY in 1976 due to the sharp increase in acreage under cultivation northeast of Koehn Lake.

Koehler (1977) then estimated water lost from storage at 365,000 AFY from 1958 to 1976 based on the data available. That averages 22,000 AFY, annually during that period. If the water lost from storage of 22,000 AFY is added to the estimated recharge of 10,000 AFY, that gives a balance with the estimate of 32,000 AFY lost annually during the same period. Koehler (1977) did not estimate the groundwater recharge from northeast of Koehn Lake and he did not estimate the loss due to evaporation from Koehn Lake.

In the development of the conceptual model for the Koehn Sub-basin a different approach was undertake to estimating the water balance and utilized current methods for estimating recharge from runoff along with data from studies in and around Fremont Valley to estimate groundwater flow up the valley from the southwest, down the valley from the northeast, and recharge from mountain-front runoff **(Appendix J to the AFC**). Groundwater inflow was estimated for 1958 and 1976. Groundwater discharge was taken from Koehler's (1977) estimates presented above.

Water Inflow for 1958 and 1976: The following estimates of water inflow were used:

a. Flow into the Koehn Lake Basin from the California City area: 1,000 AFY (Durbin 1978).
b. Flow across the Muroc Fault – not known
c. Recharge to groundwater from mountain-front runoff: 6,800 to 7,800 AFY.
d. Groundwater flow down the valley from northeast of Koehn Lake: 3,000 AFY.
e. TOTAL INFLOW: 10,800 AFY to 11,800 AFY.

Water Balance for 2007: The following estimates were developed for 2007:

a. Recharge from mountain-front runoff: 6,800 AFY to 7,800 AFY
b. Inflow from California City: 1,000 AFY
c. Evaporation from Koehn Lake: 2,800 AFY to 3,000 AFY
d. Water use by HPCC wells: 150 AFY
e. Domestic water use: 50 AFY
f. Agricultural water use: 843 AFY
g. Groundwater inflow from northeast of Koehn Lake: uncertain, maybe 1,000 to 3,000 AFY
h. Groundwater rebound –water going into storage: up to 9,000 AFY.

Table DR-112 provides a comparison of the conceptual hydrogeologic model water balance and the water balance used by the numerical groundwater model.

Groundwater consumption, including evaporation from Koehn Lake, is about 4,000 AFY (please see Appendix J-2). Groundwater inflow to the Koehn Basin is in the range of 7,000 to 10,000 AFY (please see Appendix J-2 and the approach used to derive this estimate), thus making the current groundwater recharge comparable to past recharge estimated by Koehler (1977). The main component of recharge is mountain-front recharge as developed in Appendix J-2 of the AFC. The main differences between the groundwater model and the conceptual hydrogeologic model are: (1) the difference in recharge, and (2) the absence of water loss from Koehn Lake for 1976 and 2007 in the groundwater model. In the conceptual hydrogeologic model, recharge was estimated to be around 6,800 to 7,800 AFY. This level of recharge would not allow the groundwater model to calibrate using the field measured hydraulic conductivities for the project area.

The decision was made to honor the measured field data and adjust the recharge to allow for a reasonable calibration. That resulted in a recharge total of 15,000 AFY. The flow from California City was set close to the estimate of Durbin (1978), which was about 1,000 AFY. Irrigation pumping in 1958 was estimated at around 1,000 AFY. Groundwater use in 2007 was around 1,000 AFY. Groundwater use in 1976 was about 60,000 AFY (Koehler 1977). For 1958, the groundwater model removed all recharge to the Koehn Lake Basin by evaporation from Koehn Lake, modeled as drain outflow. For 1976 and 2007, the water levels in the Koehn Lake Basin near Koehn Lake were below the drain level, and thus there was no outflow. All water loss from the model for these years was through well pumping.

Data Request 114:

> Please provide a sensitivity analysis for the model that includes the plausible ranges for aquifer parameters, recharge, and pumpage, summarized in a tabular format.

Response:

A sensitivity analysis was run on specific yield (Figure DR-114a), hydraulic conductivity (Figure DR-114b), and fault conductance (Figure DR-114c). For hydraulic conductivity, the range of values (see attached Table DR-114) was half the calibrated value to 2 times the calibrated value. This range was chosen because most hydraulic conductivity zones were so sensitive that a larger range produced calibration errors far exceeding acceptable limits. The range for specific yield was from 0.011 to 1.0. The range for the fault conductance was plus or minus one order of magnitude. Specific yield was one of the most sensitive parameters because of the extreme drawdown experienced in the valley during past agricultural pumping and the recent rise in water levels since pumping ceased. Deviation from the ideal value of 0.11 causes water levels to go out of calibration very quickly. The most sensitive hydraulic conductivity values were zones 1 through 4, which are the regional zones away from the Project Site. This is mainly because the on-site hydraulic conductivity zones used to match the aquifer tests have relatively few calibration targets compared to the regional areas. The faults in the model were all sensitive except for the Garlock Fault to the north of the Project Site. The latter is probably not sensitive due to lack of water level data near the fault.

Recharge and pumping were fixed inputs and were not varied during the calibration, except for minor variations where there was not data for 1976 onward. Because recharge and pumping parameters were fixed in the model and not calibration parameters, they were not included in the sensitivity analysis.

Additionally, Table 4.1 from AFC Appendix J.2 has been updated in response to a request made by the CEC during the call on October 7, 2008.

Data Request 115:

> Based on the sensitivity analysis, please report the magnitude of change in the simulated impacts.

Response:

The following figures were provided for the sensitivity analysis. Each of the figures varies a specific model parameter and compares the result to the predicted drawdown from the calibrated model after 30 years of pumping Well No. 48 (shown on AFC Figure 5.17-19).

- Figure DR-115a (specific yield – one half the modeled values)
- Figure DR-115b (specific yield – two times the model values)
- Figure DR-115c (hydraulic conductivity – one half the modeled values)
- Figure DR-115d (hydraulic conductivity – two times the modeled values)
- Figure DR-115e (fault conductance – hydraulic conductivity zone 7 removed)
- Figure DR-115f (fault conductance – removal of the fault from the model)

As noted in response to Data Request No.114, specific yield values were very sensitive in the calibration. The predictions for specific yield values are thus provided for a specific yield value half the calibrated value and twice the calibrated value. In the case of half the calibrated specific yield, the predicted draw downs are very similar to the base case, indicating that steady state has almost been achieved in both cases. In the case of specific yield twice the calibrated value, the draw downs predicted by the model are significantly less than the base case because steady state is a long way from being achieved in 30 years. Similarly drawdown's predicted for half the calibrated hydraulic conductivity values are not significantly different from the base case whereas the prediction where hydraulic conductivity is much higher (twice the calibrated values) shows much less drawdown at 30 years.

During discussions with CEC (October 7, 2008), the low hydraulic conductivity value on-site in zone 7 was questioned. The next sensitivity run eliminated zone 7, making it the same hydraulic conductivity as surrounding zones. This analysis shows very similar results to the base case, except that little drawdown is seen south of the Cantil Valley Fault. The final sensitivity analysis shows the effects of removing the Cantil Valley Fault from the model. This predicts much less drawdown to the northeast and about 5 ft more drawdown south of the fault.

Data Request 117:

Please provide the simulated volumetric budget for all budget components.

Response:

Table DR-117 is provided in response to this request and shows the model mass balance from 1958 through 2007.

Data Request 118:

Please clarify and provide justification for the above discrepancies between simulated and observed conditions.

Response:

The observed water levels for 1958 were those presented in Figure 4 of Koehler (1977). Figure 4.6 in Appendix J to the AFC shows the modeled water levels for the calibration to 1958 for the Koehn Lake Basin (Figure DR-102b shows the observed vs. simulated water levels for 1958). Southwest of Koehn Lake, the water levels on the south side of the Cantil Fault are offset to the southwest relative to those on the north of the Cantil Fault. Examination of the offset for the area between the project and Koehn Lake, the area of most target wells, shows that the water levels south of the Cantil Fault would be the same or slightly lower than those north of the fault. This finding is consistent with Koehler's (1977) interpretation of the water levels, shown in Figure 3.2 of Appendix J to the AFC. The amount of offset across the Cantil Fault is not as pronounced as drawn by Koehler (1977). Also, the influence of pumping on both sides of the fault is not as dramatic in the modeled contours (Figure 4.6) as in Koehler's (1977) hand-drawn contouring of the well data from Moyle (1969).

The model calibration to 1958 differs from Koehler's (1977) interpretation of the water level data for the following reasons: (1) the model did not know the location or the pumping rate of individual wells, so pumping in 1958 was generalized in the model; (2) machine contouring of data will differ from hand contouring because of the difference between a statistical averaging program and the "interpretation" of the mind of the geologist doing the hand contouring. The purpose of the 1958

calibration was to develop a steady-state calibration to a period before most of the irrigation pumping in order to have a steady-state model to use for transient calibrations during the periods when considerable data were available. The goal of the 1958 calibration was not to match the hand contours of Koehler (1977) exactly. That would have involved considerable "guess work" and adjusting of pumping wells and pumping rates to get the desired match.

Data Request 119:

Please provide plots comparing observed and simulated water levels for the data locations reported in Table 4.3.

Response:

AFC Appendix J.2 Table 4.3 "Residuals and Statics from Transient Calibration to the Pump Test Drawdown" is attached in response to this data request. Also attached are Figures DR-119a (Well No. 43), DR-119b (Well No. 63) and DR-119c (Well No. 63) that illustrate the transient calibration of the pumping test data.

Data Request 120:

Please provide the geologic data, analysis, and interpretation required to justify the simulated hydraulic conductivity distribution.

Response:

Koehler (1977) used the specific capacity data for irrigation wells in Moyle (1969) to estimate the transmissivity on the north side and on the south side of the Cantil Fault. His estimates were 20,000 feet squared per day (ft2/day) for the transmissivity on the north side of the fault and 8,000 ft2/day for the transmissivity on the south side of the fault. Using the estimates of Koehler (1977), the north side of the Cantil Fault would have an average horizontal hydraulic conductivity (Kh) of 30.8 ft/day assuming an average thickness of the saturated alluvium of 650 feet. On the south side of the Cantil Fault the average Kh is estimated to be 11.5 feet per day (ft/day) assuming an average thickness of 700 feet.

The numerical groundwater model developed for the Koehn Lake Basin used the following Kh values as shown in Figure 4.3 of Appendix J to the AFC report: (1) South of the Cantil Fault, Kh = 43.5 ft/day; (2) North of the Cantil Fault, Kh = 20 ft/day. At the northeast end of the Koehn Lake Basin, Kh values of 0.4 ft/day were used north of the projection of the Cantil Fault and Kh = 0.5 ft/day was used for south of the fault to match the gradient in Figure 4 from Koehler (1977) for the area northeast of Koehn Lake. In the project area, the pumping tests showed that the best match to the pumping test data required Kh values around 50 to 58 ft/day.

The hydraulic conductivity (Kh) values used in the model are shown in Figure 4.3 of Appendix J.2 to the AFC. North of the Cantil Fault, an average Kh of 20 ft/day was used for the area southwest of Koehn Lake. For the area south of the Cantil Fault and southwest of Koehn Lake, and average Kh of 43.5 ft/day was used. For the project area, Kh values from 50 to 58 ft/day were used in an effort to match the ENSR pumping test results.

Koehler (1977) took the specific capacity data from irrigation wells in the Fremont Valley (Moyle 1969) and estimated the transmissivity for the alluvial sediments north and south of the Cantil Fault in the area southwest of Koehn Lake. For the area north of the Cantil Fault, he estimated an average transmissivity of 20,000 ft2/day; for the area south of the Cantil Fault, he estimated a transmissivity of 8,000 ft2/day. As discussed above, this translates into an average Kh of about 30.8 ft/day for the area north of the Cantil Fault and an average Kh of about 11.5 ft/day for the area south of the Cantil Fault. The numerical groundwater model used 20 ft/day for the area north of the Cantil Fault, but had higher Kh values ranging from 50 to 58 ft/day in the project area. Since most of the irrigation wells used by Koehler (1977) were near the proposed project area, the area-weighted Kh for the model north of the Cantil Fault would be reasonably close to the estimate of Koehler (1977) for the alluvial aquifer north of the Cantil Fault.

The main difference between the groundwater model and Koehler (1977) is found south of the Cantil Fault. Koehler (1977) estimated an average transmissivity of 8,000 ft2/day and assuming an average thickness of 700 feet, this gives an average Kh around 11.5 ft/day. This value could easily vary by two times on either side of 11.5 ft/day. The groundwater model needed a Kh of 43.5 ft/day to calibrate to 1958 water levels. This Kh is certainly higher than what was estimated by Koehler (1977) based on specific capacity data from about a dozen wells in Moyle (1969) for this part of the Koehn Basin. The specific capacity data reflect local aquifer conditions near the irrigation wells for pumping conditions in the Koehn Basin during the time period from the 1950's to about 1966. In some cases, irrigation wells may have interfered with one another, causing more drawdown in a well than would be the case if no other pumping wells were operating. That could lead to abnormally low specific capacity data. But, more importantly, the groundwater model is "seeing" the entire basin southwest of Koehn Lake and trying to match water levels for 1958 over a large area with the constraints imposed by the recharge distribution, the selection of Kh values for the project area based on the ENSR pumping tests, and the boundary conditions of the model domain. Thus, the Kh of 43.5 ft/day need to calibrate to water levels southwest of Koehn Lake and south of the Cantil Fault for 1958 reflects a more encompassing view of the basin than the specific capacity data of Koehler (1977). For that reason, the Kh value needed to calibrate the groundwater model may be more reflective of average conditions for the alluvial aquifer southwest of Koehn Lake and in the part of the basin south of the Cantil Fault.

Data Request 121:

Please provide hydrographs for additional wells. The number and distribution of wells should encompass as much of the geographic area represented by the model as possible.

Response:

Figure DR-121a shows the distribution of wells used in the "verification" run and those additional wells that were added to expand the geographic coverage within the Koehn Sub-basin. In addition to AFC Appendix J-2 hydrographs were provided for verification of the model and shown as Figures 4.7, 4.8 and 4.9. Ten additional wells, some from the additional verification and some new were analyzed and the hydrographs are shown on Figures DR-121b through DR-121k.

Most of the simulated well hydrographs match fairly well considering there is no information on the location and rates of pumping in the area from 1976 to present. The nine wells added in response to the CEC data request were not considered during calibration and so adjustments to local pumping conditions were not made in an attempt to match these hydrographs. The wells that do not match well are most likely caused by local pumping conditions being different from those simulated in the model for the period from 1976 to 2007.

Data Request 122:

Because recharge and/or pumpage were "changed" in the "verification" run in order to match between observed and simulated groundwater levels, please provide a comparison, using either tables or figures, of estimated and "changed" recharge and pumpage values over the 1958-2007 simulation period.

Response:

First, recharge rates were not changed in any of the calibration runs. Recharge was estimated as part of the model water budget and input to the model as a constant rate over time. Pumping rates were not really changed either from published data. The only adjustments that were made were to the post-1976 time period when no data on pumping rates could be found. The USGS published basin total pumping up to 1976. After that time, there are no estimates of pumping rates. These post-1976 rates were adjusted to match water levels in that time period. The philosophy was that storage and hydraulic conductivity were estimated during time periods when pumping was either known or reliably estimated. For periods when pumping was not known, those rates were adjusted instead of hydraulic conductivity or storage.

Table DR-122 provides the pumping rates used in the modeling and the associated references for each model year during the verification run.

Data Request 123:

Please provide the simulated volumetric budget and compare to previously estimated flow components. Because it is a transient model run, and simulates the period 1958 through 2007, average, annual flow rates will suffice.

Response:

Please see response to Data Request No. 117, where the model mass budget was provided.

Tables

Table DR-112
Water Balance Comparison
Conceptual Site Model and Numerical Groundwater Model
Beacon Solar Energy Project
Kern County, California

Water Balance Components	1958		1976		2007	
	Conceptual Model	Groundwater Model	Conceptual Model	Groundwater Model	Conceptual Model	Groundwater Model
	acre-feet per year					
Inflow						
Flow from California City	1,000	997	1,000	997	1,000	997
Flow across Muroc Fault	--	670	--	670	--	670
Mountain-Front Recharge	6,800-7,800	15,000	6,800-7,800	15,000	6,800-7,800	15,000
Groundwater flow from Northeast	3,000	based on recharge cells[4]	3,000	based on recharge cells[4]	1,000-3,000	based on recharge cells[4]
of Koehn Lake						
Outflow						
Evaporation from Koehn Lake	--	15,800	--	0	2,800-3,000	0
Water use by Honda Wells	none	0	0	0	150	included with ag pumping[3]
Domestic Water Use[1]	not considered	0	not considered	not considered	50	included with ag pumping[3]
Agricultural Water Use[2]	up to 18,000	846	60,000	60,000	843	846

Notes
1 = "Domestic water" use was not considered in some cases since it was a fraction of the agricultural water use and there was no data from which to provide an annualized volume e
2 = "Agricultural use" is after Koehler, 1977 for 1958 and 1976. The value for 2007 is based on an estimate of acres under agricultural use from field surveys and photographic rese
3 = "Included with ag pumping" indicates that the model combined domestic and Honda water usage into the agricultural useage.
4 = "Based on recharge cells", refers to flux set by the model NE of Koehn Lake.
-- = Not known or available in literature for the Koehn Sub-basin.

Table DR-114
Sensitivity Analysis Parameter Ranges
Beacon Solar Energy Project
Kern County, California

Parameter	Model Zone	Minimum Value	Calibrated Value	Maximum Value
Kx (ft/d)	1	10	20	40
Kx (ft/d)	2	21.75	43.5	87
Kx (ft/d)	3	0.2	0.4	0.8
Kx (ft/d)	4	0.26	0.52	1.04
Kx (ft/d)	5	34.4	68.8	137.6
Kx (ft/d)	7	0.055	0.11	0.22
Kx (ft/d)	8	25.85	51.7	103.4
Kx (ft/d)	9	25.1	50.2	100.4
Kx (ft/d)	10	29.05	58.1	116.2
Sy	1	0.055	0.11	0.22
Fault K (ft/d)	Garlock	0.5	1	2
Fault K (ft/d)	Cantil Valley	0.000097829	0.000195658	0.000391316
Fault K (ft/d)	Muroc	1.84466E-05	3.69E-05	7.37862E-05
Fault K (ft/d)	Randsburg	0.00098317	0.00196634	0.00393268

Notes

ft/d = Feet per day
Kv = hydraulic conductivity
Sy = specific yield
fault K = fault conductance

Table 4.1 (DR-114)
Summary of Calibrated Model Parameters for the Fremont Valley Model
Beacon Solar Energy Project
Kern County, California

Parameter Type	Zone	Location	Parameter Value	Units
Hydraulic Conductivity	1	Between Cantil Valley and Garlock Faults	20.00	ft/d
Hydraulic Conductivity	2	South of Cantil Valley Fault	43.51	ft/d
Hydraulic Conductivity	3	East End of Valley Between North of Cantil Valley Fault	0.40	ft/d
Hydraulic Conductivity	4	East End of Valley Between South of Cantil Valley Fault	0.53	ft/d
Hydraulic Conductivity	5	North of Garlock Fault	68.80	ft/d
Hydraulic Conductivity	7	Northeast corner of Project Beacon Site	0.11	ft/d
Hydraulic Conductivity	8	Western edge of Project Beacon Site	51.70	ft/d
Hydraulic Conductivity	9	Central part of Project Beacon Site	50.23	ft/d
Hydraulic Conductivity	10	Southeastern corner of Project Beacon Site	58.08	ft/d
Specific Yield	1	Between Cantil Valley and Garlock Faults	0.1100	dimensionless
Specific Yield	2	South of Cantil Valley Fault	0.1100	dimensionless
Specific Yield	3	East End of Valley Between North of Cantil Valley Fault	0.1100	dimensionless
Specific Yield	4	East End of Valley Between South of Cantil Valley Fault	0.1100	dimensionless
Specific Yield	5	North of Garlock Fault	0.1100	dimensionless
Specific Yield	7	Northeast corner of Project Beacon Site	0.1100	dimensionless
Specific Yield	8	Western edge of Project Beacon Site	0.1100	dimensionless
Specific Yield	9	Central part of Project Beacon Site	0.1100	dimensionless
Specific Yield	10	Southeastern corner of Project Beacon Site	0.1100	dimensionless
Storage Coefficient	7	Northeast corner of Project Beacon Site	0.0138	dimensionless
Storage Coefficient	8	Western edge of Project Beacon Site	0.0097	dimensionless
Storage Coefficient	9	Central part of Project Beacon Site	0.0004	dimensionless
Storage Coefficient	10	Southeastern corner of Project Beacon Site	0.0027	dimensionless
Fault Hydraulic Conductivity	0	Garlock Fault	1	ft/d
Fault Hydraulic Conductivity	1	Cantil Valley Fault	0.00020	ft/d
Fault Hydraulic Conductivity	2	Randsburg-Mojave Fault	0.00197	ft/d
Fault Hydraulic Conductivity	3	Muroc Fault	0.000037	ft/d

Notes
ft/d = Feet per day
Kv = hydraulic conductivity
Sy = specific yield
fault K = fault conductance

Table DR-117
Mass Balance for Model Simulation from 1958 to 2007
(all rates in cubic feet per day)
Beacon Solar Energy Project
Kern County, California

Time (days)	Year	Well InflowBasin Inflow from South	GHB InflowFlow Across Muroc Fault	Storage Inflow	Recharge	Well Pumping	Drain OutflowKoehn Lake	Storage Outflow
365	1958	119,342	79,990	0	1,790,148	-100,602	-1,891,114	0
730	1959	119,342	83,047	1,028,478	1,790,148	-1,174,684	-1,845,053	0
1095	1960	119,342	83,047	1,989,604	1,790,148	-2,248,766	-1,732,037	0
1460	1961	119,342	83,047	2,600,960	1,790,148	-3,024,492	-1,567,598	0
1825	1962	119,342	83,047	2,773,908	1,790,148	-3,382,520	-1,382,490	0
2190	1963	119,342	83,047	1,851,247	1,790,148	-2,606,794	-1,234,652	-994
2555	1964	119,342	83,048	1,900,562	1,790,148	-2,785,808	-1,106,005	0
2920	1965	119,342	83,049	1,497,201	1,790,148	-2,487,451	-1,001,034	0
3285	1966	119,342	83,051	1,180,380	1,790,148	-2,248,766	-922,821	-105
3650	1967	119,342	83,053	1,931,941	1,790,148	-3,084,164	-839,094	0
4015	1968	119,342	83,056	2,656,053	1,790,148	-3,919,561	-727,783	0
4380	1969	119,342	83,061	2,944,869	1,790,148	-4,337,260	-598,873	0
4745	1970	119,342	83,067	2,630,129	1,790,148	-4,158,246	-463,155	0
5110	1971	119,342	83,075	2,528,606	1,790,148	-4,158,246	-361,648	0
5475	1972	119,342	83,084	2,556,165	1,790,148	-4,277,588	-269,957	0
5840	1973	119,342	83,094	2,954,765	1,790,148	-4,754,958	-191,267	0
6205	1974	119,342	83,106	2,998,382	1,790,148	-4,874,301	-115,554	0
6570	1975	119,342	83,121	3,227,145	1,790,148	-5,172,657	-45,967	-128
6935	1976	119,342	83,136	5,209,812	1,790,148	-7,201,478	0	0
7300	1977	119,342	83,154	5,269,464	1,790,148	-7,261,150	0	0
7665	1978	119,342	83,173	4,430,945	1,790,148	-6,401,884	0	-20,767
8030	1979	119,342	83,194	4,314,687	1,790,148	-6,306,410	0	0
8395	1980	119,342	83,217	3,445,549	1,790,148	-5,346,717	0	-90,581
8760	1981	119,342	83,241	2,534,245	1,790,148	-4,010,082	0	-515,935
9125	1982	119,342	83,267	2,077,994	1,790,148	-3,571,397	0	-498,396
9490	1983	119,342	83,295	1,853,618	1,790,148	-3,571,397	0	-274,048
9855	1984	119,342	83,324	1,601,833	1,790,148	-3,296,076	0	-297,610
10220	1985	119,342	83,354	1,352,768	1,790,148	-2,796,076	0	-548,575
10585	1986	119,342	83,385	1,158,112	1,790,148	-2,500,602	0	-649,426
10950	1987	119,342	83,417	1,007,940	1,790,148	-2,300,602	0	-699,285
11315	1988	119,342	83,450	899,683	1,790,148	-2,400,602	0	-491,060
11680	1989	119,342	83,484	992,254	1,790,148	-2,500,602	0	-483,666
12045	1990	119,342	83,518	921,043	1,790,148	-2,500,602	0	-412,490
12410	1991	119,342	83,552	847,424	1,790,148	-2,110,602	0	-728,906
12775	1992	119,342	83,587	775,754	1,790,148	-2,100,602	0	-667,268
13140	1993	119,342	83,622	633,733	1,790,148	-2,000,602	0	-625,283
13505	1994	119,342	83,656	620,161	1,790,148	-2,300,602	0	-311,744
13870	1995	119,342	83,691	500,729	1,790,148	-2,100,602	0	-392,345
14235	1996	119,342	83,725	419,901	1,790,148	-880,602	0	-1,531,553
14600	1997	119,342	83,758	354,772	1,790,148	-700,602	0	-1,646,458
14965	1998	119,342	83,791	334,343	1,790,148	-1,000,602	0	-1,326,061
15330	1999	119,342	83,824	250,239	1,790,148	-100,602	0	-2,141,989
15695	2000	119,342	83,856	206,412	1,790,148	-100,602	0	-2,098,194
16060	2001	119,342	83,887	170,372	1,790,148	-100,602	0	-2,062,186
16425	2002	119,342	83,917	140,542	1,790,148	-100,602	0	-2,032,387
16790	2003	119,342	83,947	115,650	1,790,148	-100,602	0	-2,007,524
17155	2004	119,342	83,976	95,575	1,790,148	-100,602	0	-1,987,477
17520	2005	119,342	84,003	80,336	1,790,148	-100,602	0	-1,972,267
17885	2006	119,342	84,030	68,315	1,790,148	-100,602	0	-1,960,274
18250	2007	119,342	84,056	58,796	1,790,148	-100,602	0	-1,950,779

Notes
GHB = general head boundary

Table 4.3 (DR-119)
Residuals and Statistics for the Transient Calibration to Pump Test Drawdown
Beacon Solar Energy Project
Kern County, California

Name	Time (days)	Pumping Well	Easting	Northing	Observed Drawdown (ft)	Computed Drawdown (ft)	Residual (ft)
46	0.5	43	1,342,509	12,804,500	0.15	0.07	0.08
46	1	43	1,342,509	12,804,500	0.30	0.21	0.09
46	2	43	1,342,509	12,804,500	0.57	0.61	-0.04
46	3	43	1,342,509	12,804,500	1.05	1.08	-0.03
50	0.5	43	1,338,386	12,803,743	0.04	0.00	0.04
50	1	43	1,338,386	12,803,743	0.26	0.00	0.26
50	2	43	1,338,386	12,803,743	0.53	0.01	0.52
50	3	43	1,338,386	12,803,743	0.85	0.05	0.80
USGS	0.5	43	1,339,694	12,801,248	3.20	3.04	0.16
USGS	1	43	1,339,694	12,801,248	5.70	5.83	-0.13
USGS	2	43	1,339,694	12,801,248	9.50	9.47	0.03
USGS	3	43	1,339,694	12,801,248	12.37	11.66	0.71
41	0.5	48	1,333,612	12,798,544	1.22	0.26	0.96
41	1	48	1,333,612	12,798,544	1.55	0.67	0.88
41	2	48	1,333,612	12,798,544	1.81	1.39	0.41
41	3	48	1,333,612	12,798,544	1.93	1.95	-0.02
47	0.5	48	1,329,846	12,797,459	1.14	0.42	0.72
47	1	48	1,329,846	12,797,459	1.57	0.86	0.71
47	2	48	1,329,846	12,797,459	2.25	1.46	0.79
47	3	48	1,329,846	12,797,459	2.75	1.88	0.87
49	0.5	48	1,334,463	12,800,146	0.12	0.13	-0.01
49	1	48	1,334,463	12,800,146	0.22	0.39	-0.17
49	2	48	1,334,463	12,800,146	0.31	0.91	-0.60
49	3	48	1,334,463	12,800,146	0.41	1.34	-0.93
44	0.5	63	1,335,918	12,799,848	4.01	3.86	0.15
44	1	63	1,335,918	12,799,848	5.12	4.63	0.49
44	2	63	1,335,918	12,799,848	6.37	5.56	0.81
44	3	63	1,335,918	12,799,848	7.26	6.21	1.05
45B	0.5	63	1,336,096	12,801,531	0.43	0.14	0.29
45B	1	63	1,336,096	12,801,531	0.70	0.32	0.38
45B	2	63	1,336,096	12,801,531	0.86	0.70	0.16
45B	3	63	1,336,096	12,801,531	0.92	1.09	-0.17
49	0.5	63	1,334,463	12,800,146	5.05	4.42	0.63
49	1	63	1,334,463	12,800,146	5.66	5.09	0.57
49	2	63	1,334,463	12,800,146	6.09	5.91	0.18
49	3	63	1,334,463	12,800,146	6.17	6.49	-0.32
Residual Mean							**0.29**
Residual Standard Deviation							**0.45**
Absolute Residual Mean							**0.42**
Minimum Residual							**-0.93**
Maximum Residual							**1.05**
Range in Head							**12.25**
Residual Mean/Range							**2.3%**
Residual Standard Deviation/Range							**3.7%**
Absolute Residual Mean/Range							**3.4%**

Notes

ft = feet
USGS = United States Gological Survey Well

Table DR-122
Well Pumping Used in Model Run from 1958 to 2007
Beacon Solar Energy Project
Kern County, California

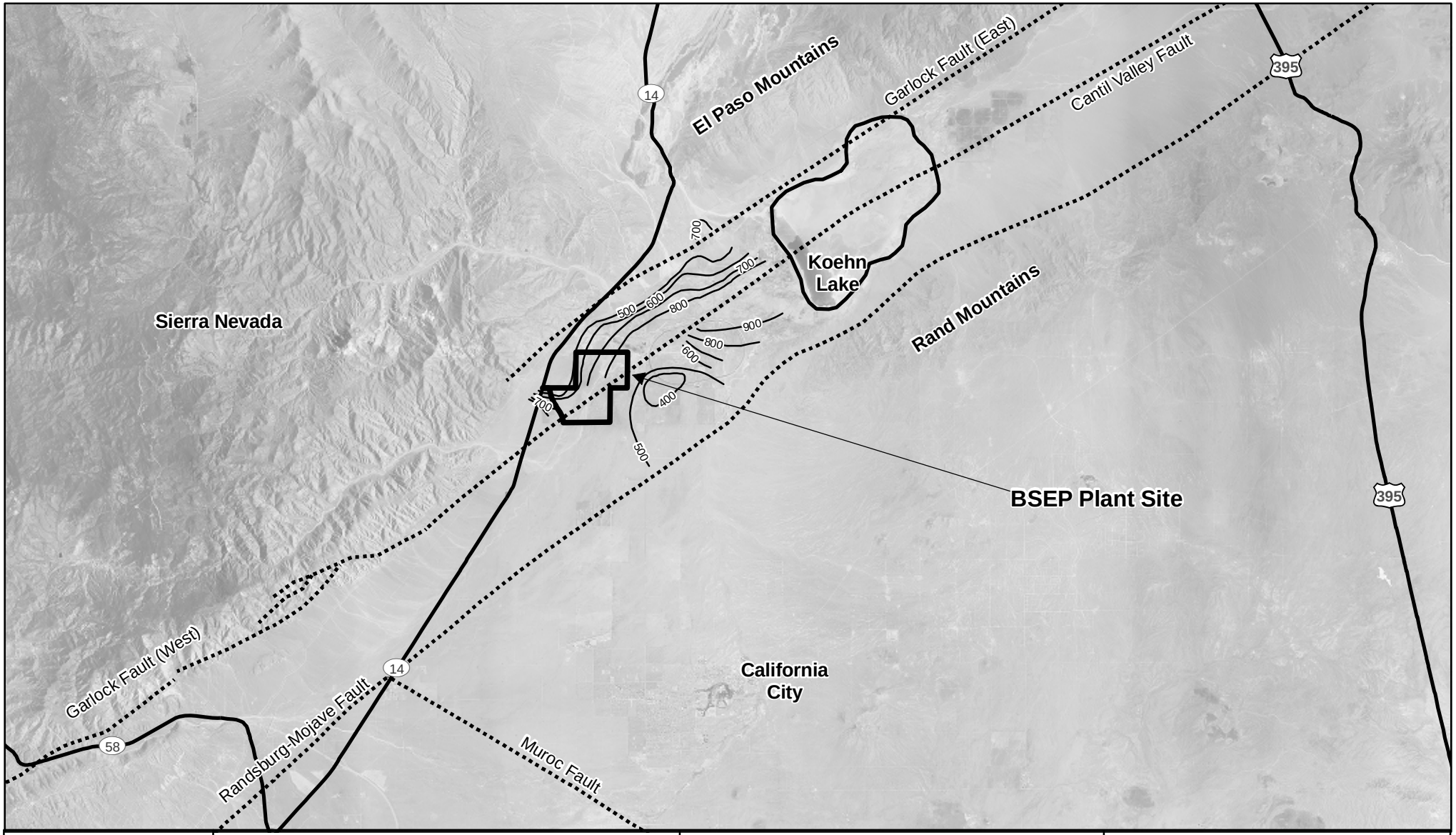
Model Elapsed Time (days)	Year	Well Pumping (ft3/d)	Well Pumping (AF/Yr)	Reference
365	1958	-100,602	843	Estimated
730	1959	-1,174,684	9,843	Koehler, 1977
1095	1960	-2,248,766	18,843	Koehler, 1977
1460	1961	-3,024,492	25,343	Koehler, 1977
1825	1962	-3,382,520	28,343	Koehler, 1977
2190	1963	-2,606,794	21,843	Koehler, 1977
2555	1964	-2,785,808	23,343	Koehler, 1977
2920	1965	-2,487,451	20,843	Koehler, 1977
3285	1966	-2,248,766	18,843	Koehler, 1977
3650	1967	-3,084,164	25,843	Koehler, 1977
4015	1968	-3,919,561	32,843	Koehler, 1977
4380	1969	-4,337,260	36,343	Koehler, 1977
4745	1970	-4,158,246	34,843	Koehler, 1977
5110	1971	-4,158,246	34,843	Koehler, 1977
5475	1972	-4,277,588	35,843	Koehler, 1977
5840	1973	-4,754,958	39,843	Koehler, 1977
6205	1974	-4,874,301	40,843	Koehler, 1977
6570	1975	-5,172,657	43,343	Koehler, 1977
6935	1976	-7,201,478	60,343	Koehler, 1977
7300	1977	-7,261,150	60,843	Estimated
7665	1978	-6,401,884	53,643	Estimated
8030	1979	-6,306,410	52,843	Estimated
8395	1980	-5,346,717	44,801	Estimated
8760	1981	-4,010,082	33,601	Estimated
9125	1982	-3,571,397	29,926	Estimated
9490	1983	-3,571,397	29,926	Estimated
9855	1984	-3,296,076	27,619	Estimated
10220	1985	-2,796,076	23,429	Estimated
10585	1986	-2,500,602	20,953	Estimated
10950	1987	-2,300,602	19,277	Estimated
11315	1988	-2,400,602	20,115	Estimated
11680	1989	-2,500,602	20,953	Estimated
12045	1990	-2,500,602	20,953	Estimated
12410	1991	-2,110,602	17,685	Estimated
12775	1992	-2,100,602	17,601	Estimated
13140	1993	-2,000,602	16,764	Estimated
13505	1994	-2,300,602	19,277	Estimated
13870	1995	-2,100,602	17,601	Estimated
14235	1996	-880,602	7,379	Estimated
14600	1997	-700,602	5,871	Estimated
14965	1998	-1,000,602	8,384	Estimated
15330	1999	-100,602	843	Estimated
15695	2000	-100,602	843	Estimated

Table DR-122
Well Pumping Used in Model Run from 1958 to 2007
Beacon Solar Energy Project
Kern County, California

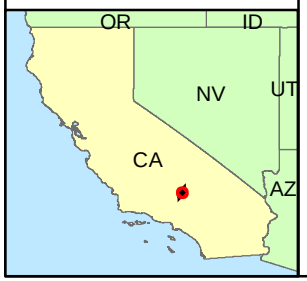
Model Elapsed Time (days)	Year	Well Pumping (ft3/d)	Well Pumping (AF/Yr)	Reference
16060	2001	-100,602	843	Estimated
16425	2002	-100,602	843	Estimated
16790	2003	-100,602	843	Estimated
17155	2004	-100,602	843	Estimated
17520	2005	-100,602	843	Estimated
17885	2006	-100,602	843	Estimated
18250	2007	-100,602	843	Estimated

Notes
AF/Yr = acre=feet per year
ft^3/d = cubic feet per day
d = days

Figures



Map Location



Legend

- Alluvium_Thickness-feet
- Fault
- BSEP Plant Site Boundary

Note: Fault locations are approximate
Source: Koehler, 1977

0 2 4 6 8 Miles

1:253,440

BSEP

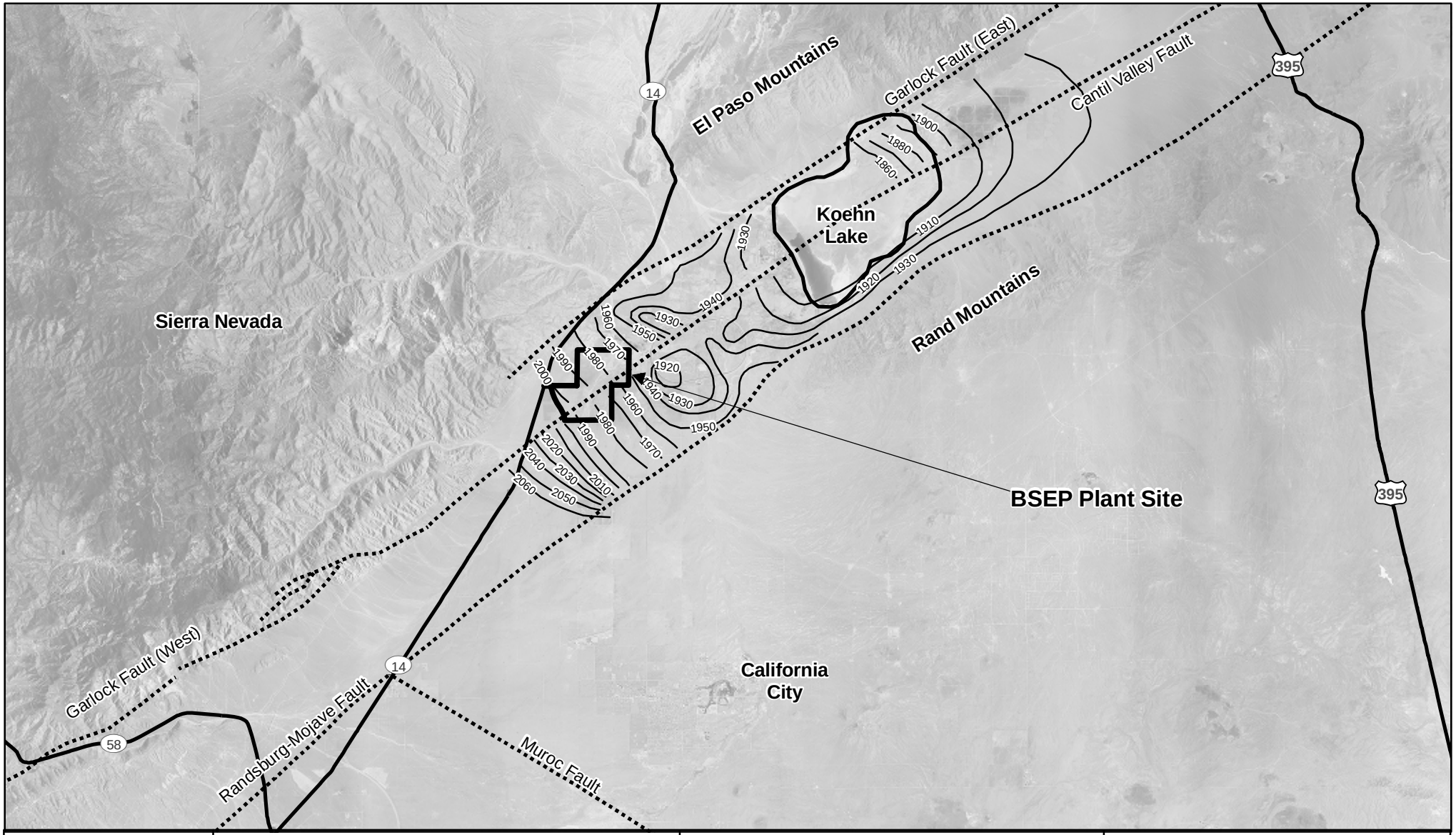
Figure DR-102a
Alluvial Thickness for the Koehn Sub-Basin

Beacon Solar

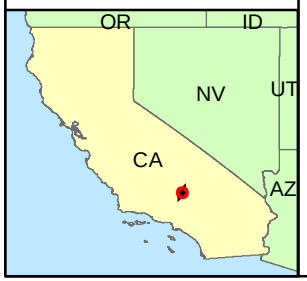
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-102a.mxd



Map Location



Legend

- Groundwater Contour (feet amsl)
- Fault
- BSEP Plant Site Boundary

Note: Fault locations are approximate
Source: Koehler, 1977

0 2 4 6 8 Miles

1:253,440

BSEP

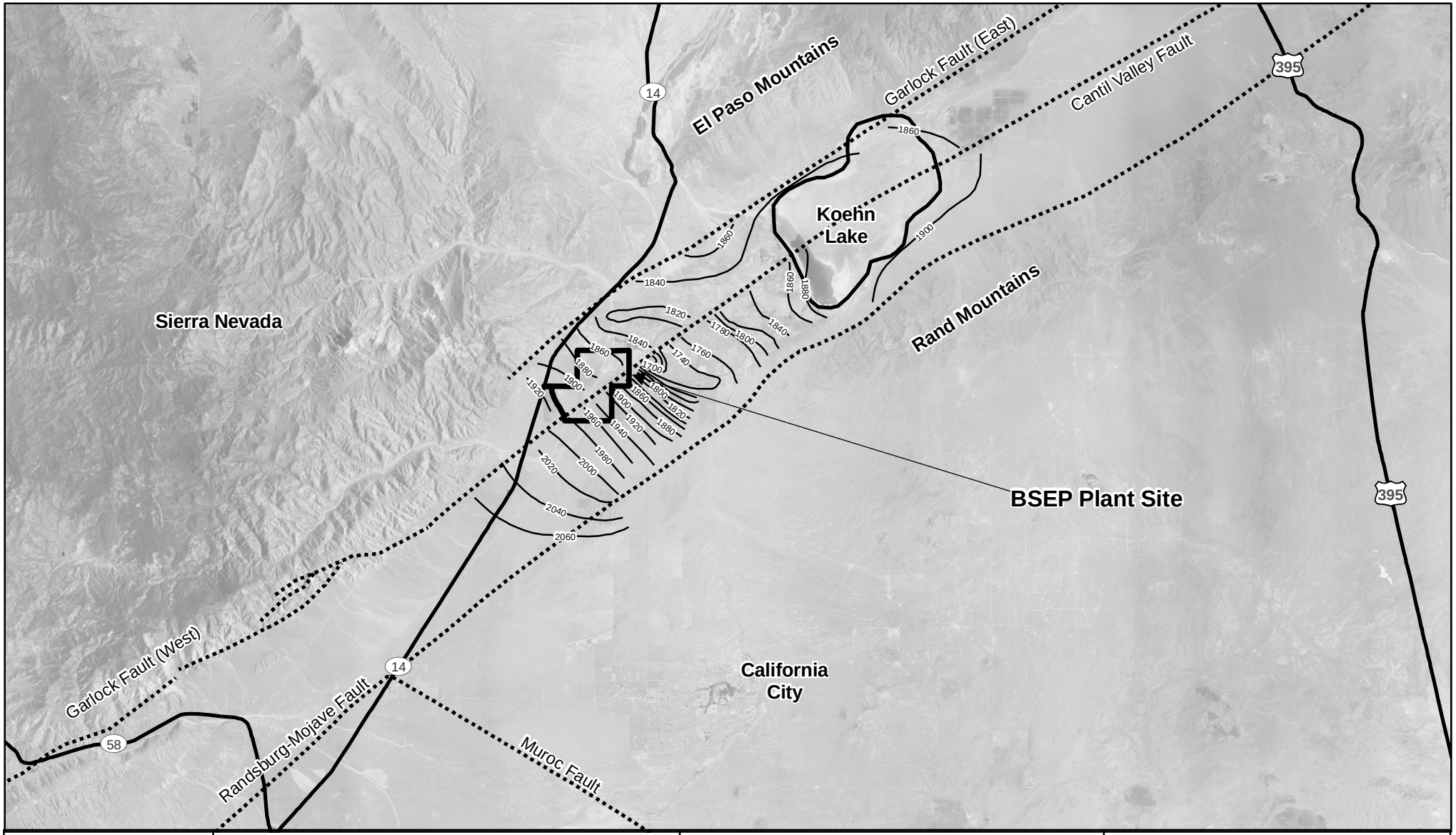
Figure DR-102b
Water Level Contour Map (1958)
Koehn Sub-Basin

Beacon Solar

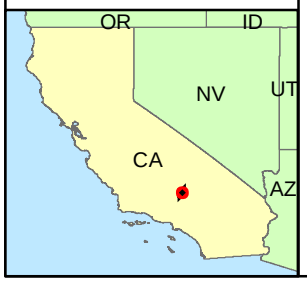
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-102b.mxd



Map Location



Legend

- Groundwater Contour (feet amsl)
- Fault
- BSEP Plant Site Boundary

Note: Fault locations are approximate
Source: Koehler, 1977

0 2 4 6 8 Miles

1:253,440

N W E S

BSEP

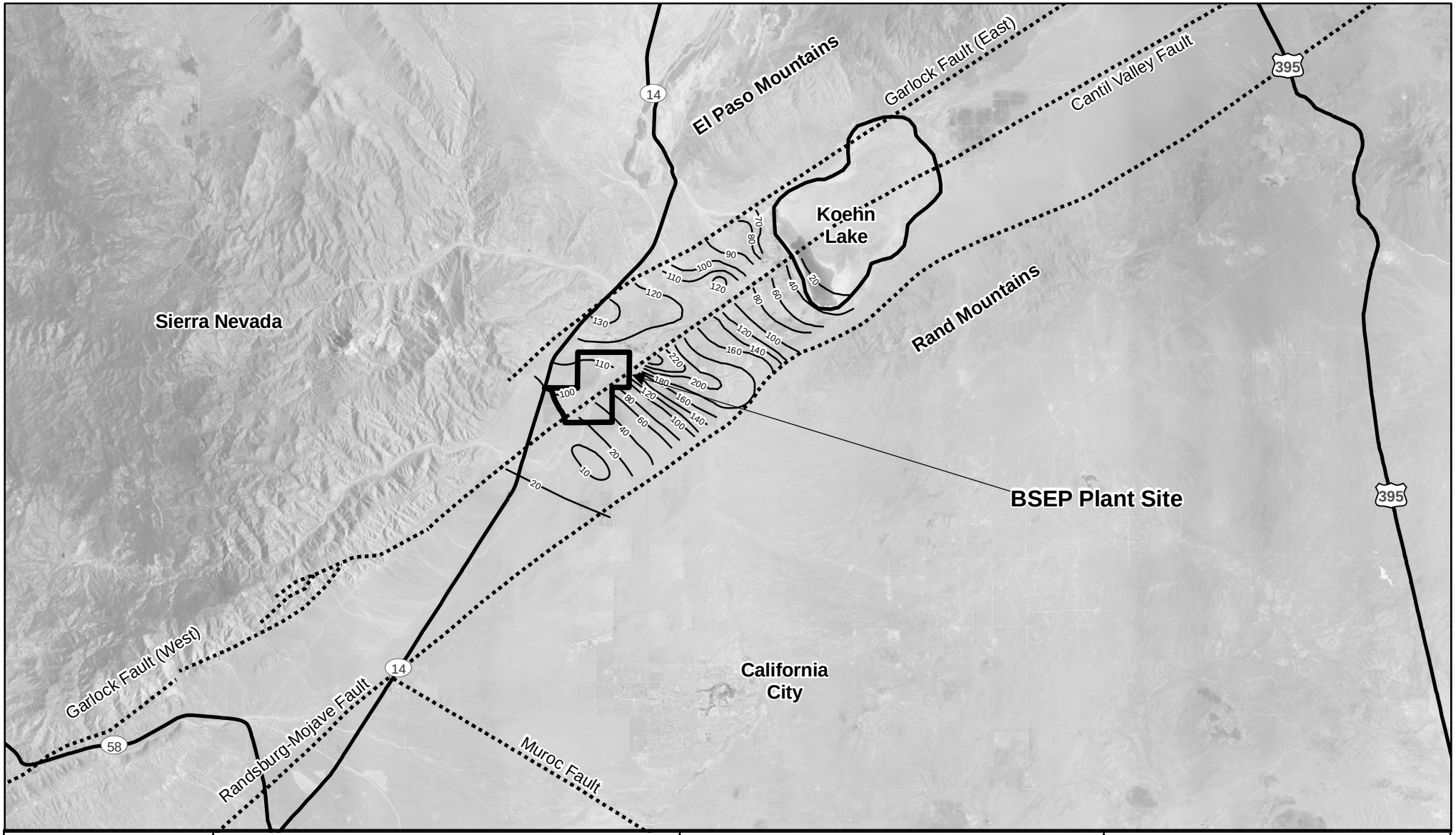
Figure DR-102c
Water Level Contour Map (1976)
Koehn Sub-Basin

Beacon Solar

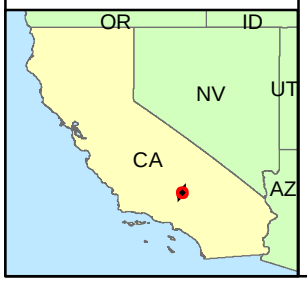
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-102c.mxd



Map Location



Legend

- Drawdown (feet)
- Fault
- BSEP Plant Site Boundary

Note: Fault locations are approximate
Source: Koehler, 1977

0 2 4 6 8 Miles

1:253,440

BSEP

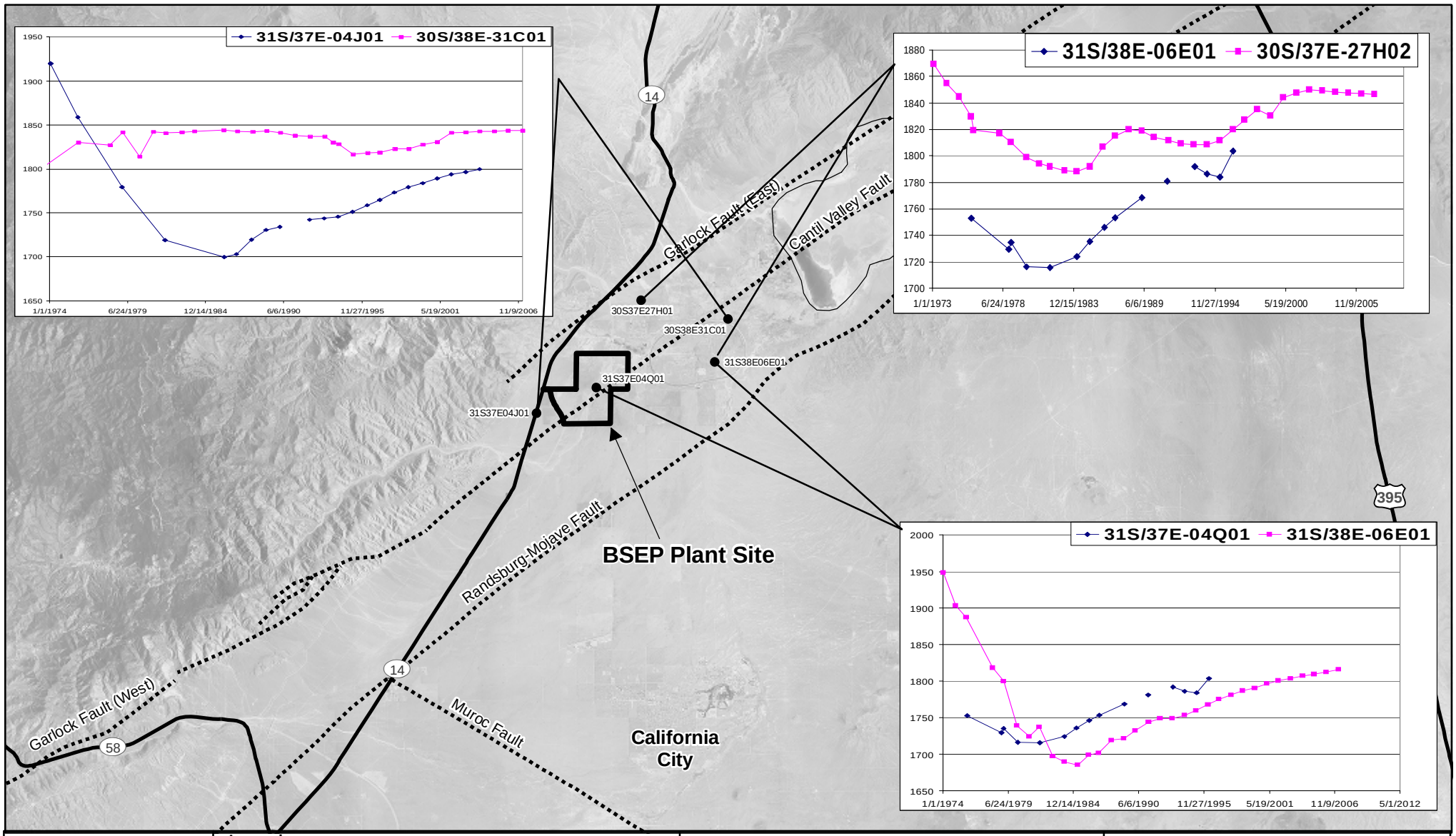
Figure DR-102d
Groundwater Drawdown between 1958 and 1976
Koehn Sub-Basin

Beacon Solar

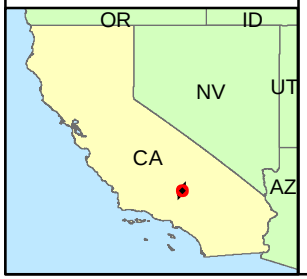
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-102d.mxd



Map Location



Legend

Fault

BSEP Plant Site Boundary

N W E S

Note: Additional hydrographs presented in Appendix J.1

0 2 4 6 8 Miles

1:253,440

BSEP

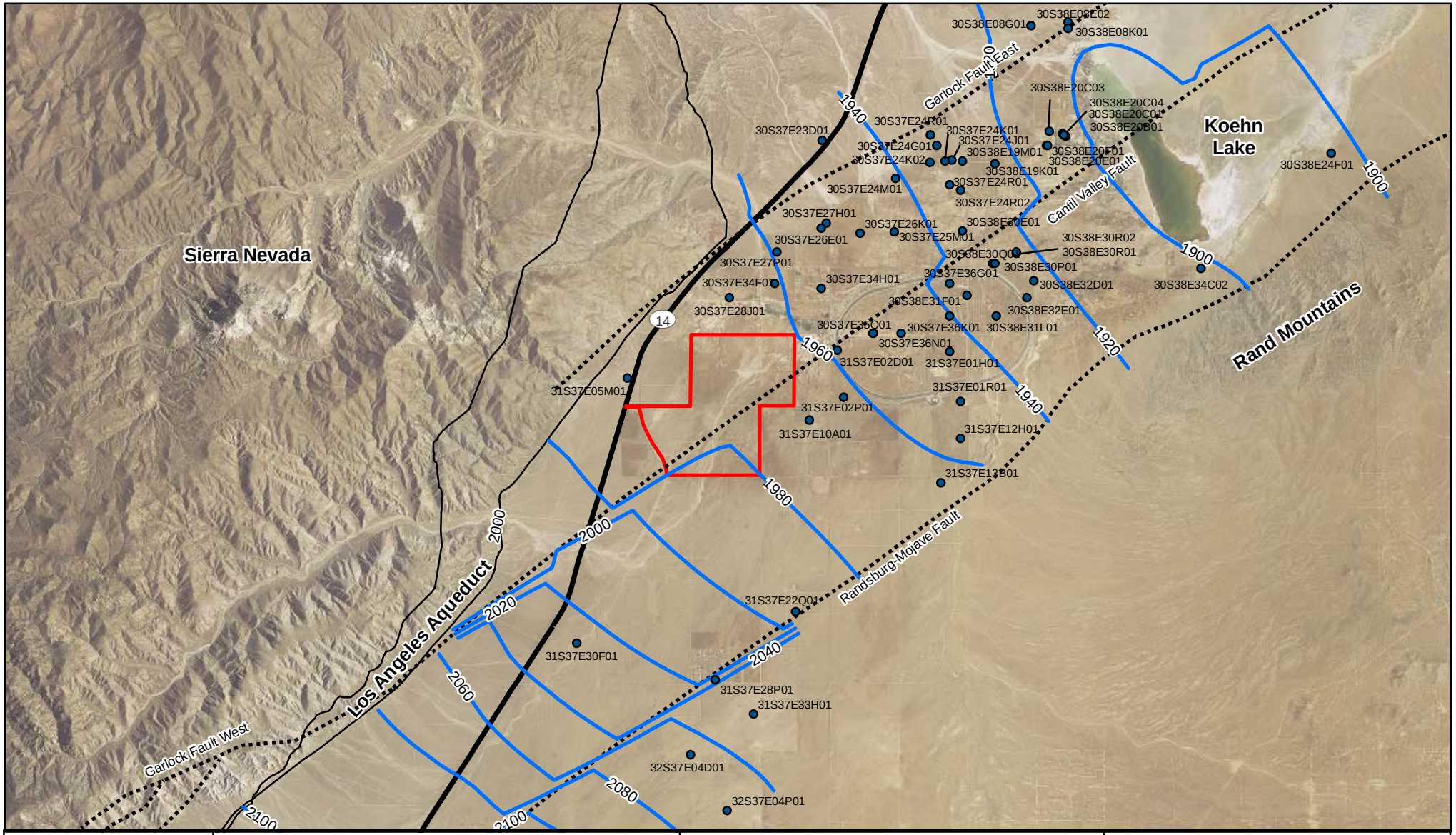
Figure DR-103
Hydrographs of Selected Key Wells within the Koehn Sub-basin

Beacon Solar

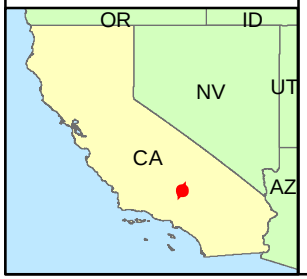
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-103.mxd



Map Location



Legend

- Model Targets
- Model Predicted Contours (1958)
- Los Angeles Aqueduct
- Fault
- BSEP Plant Site Boundary

Note: Groundwater model presented in Appendix J.2
Fault locations are approximate

0 1 2 3 4 Miles

1:126,720

N W E S

BSEP

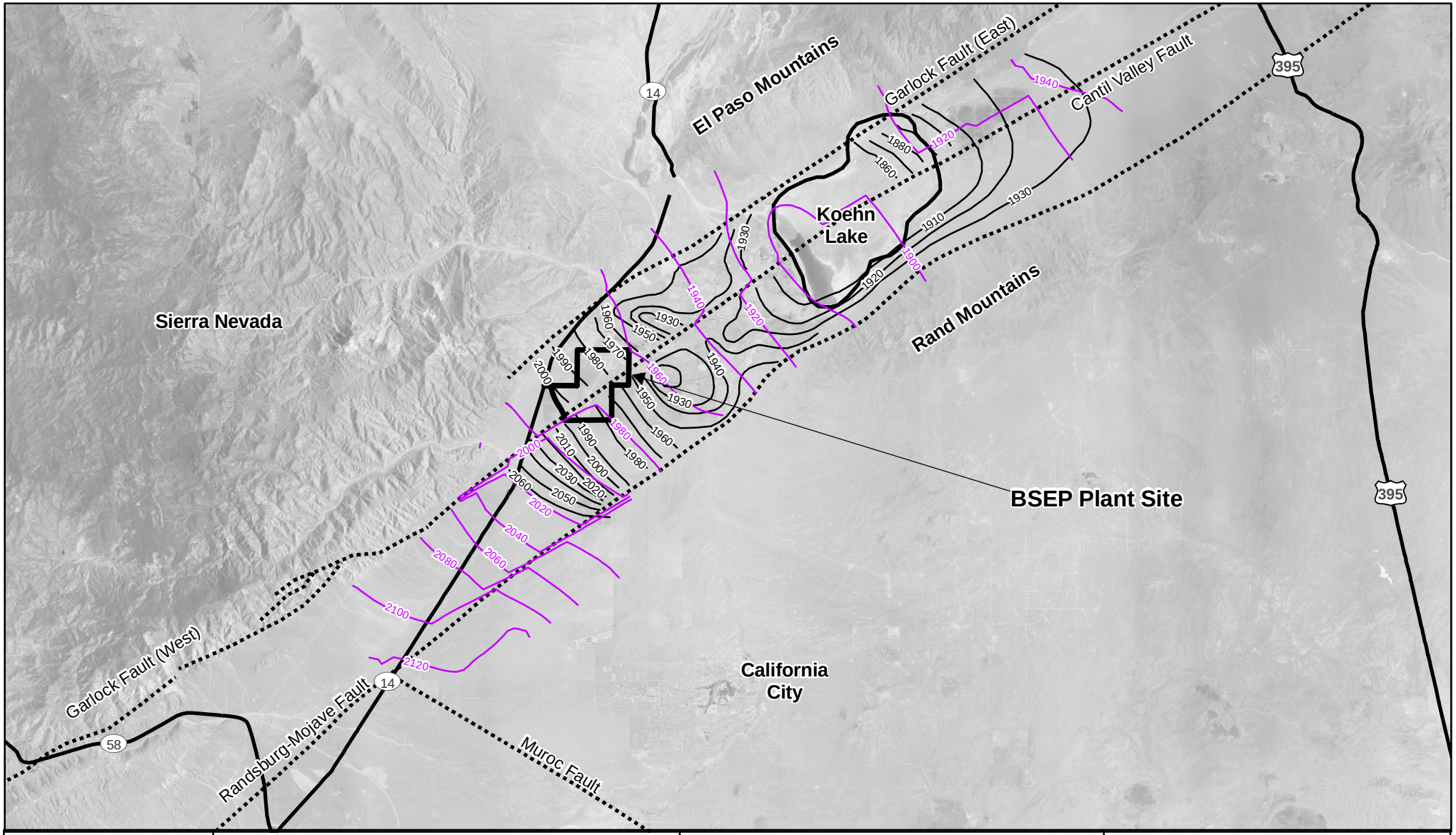
Figure DR-106
Model Targets

Beacon Solar

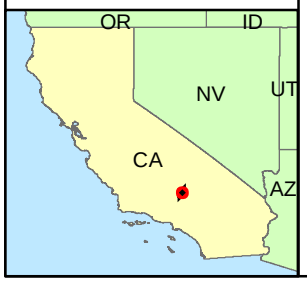
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-106.mxd



Map Location



Legend

- Predicted 1958 Water Levels
- Groundwater Contour (feet amsl) (Koehler, 1977)
- Fault
- BSEP Plant Site Boundary

Note: Fault locations are approximate
Source: Koehler, 1977

0 2 4 6 8 Miles

1:253,440

BSEP

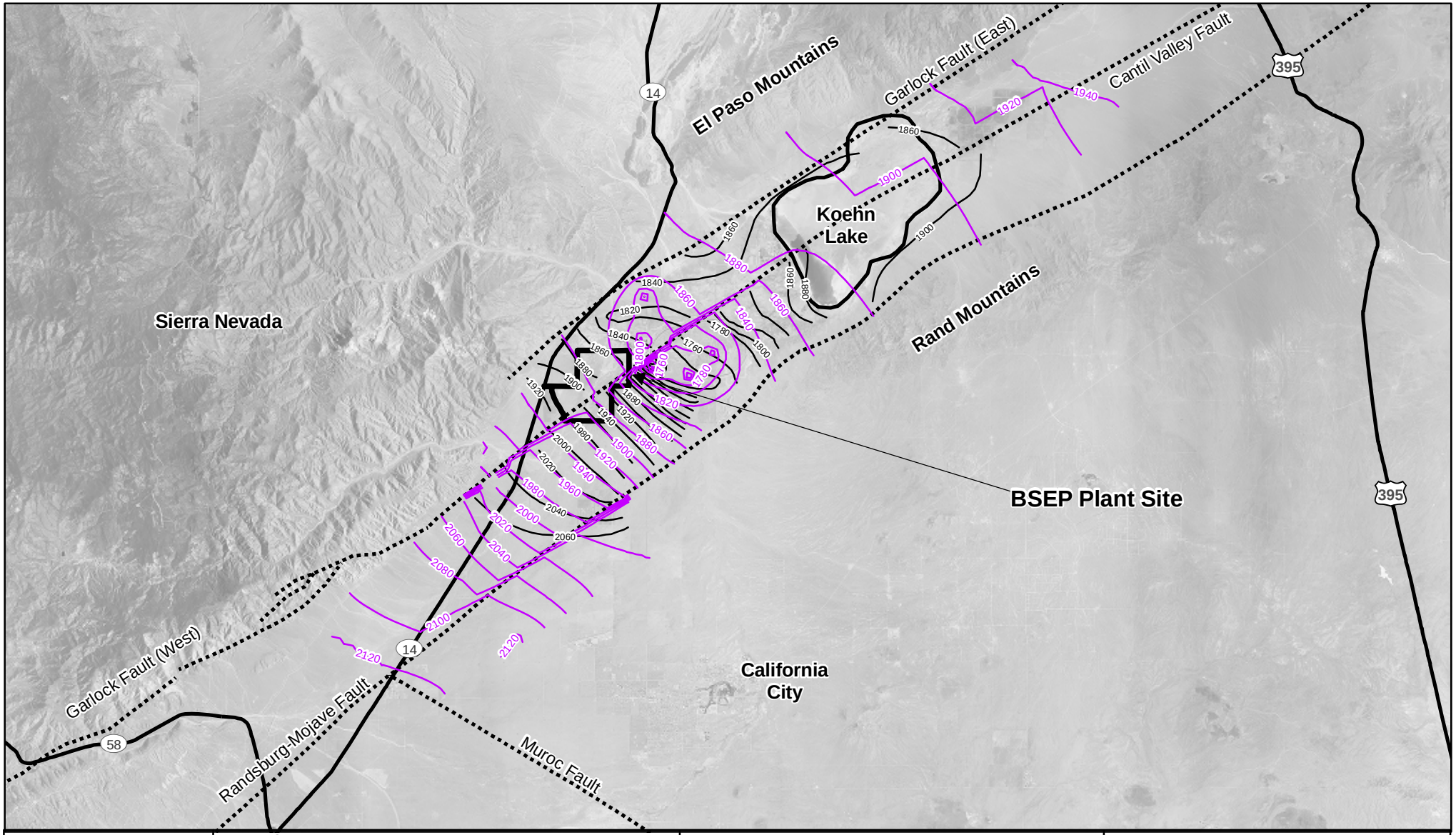
Figure DR-107
Predicted vs. Observed Water Levels (1958)

Beacon Solar

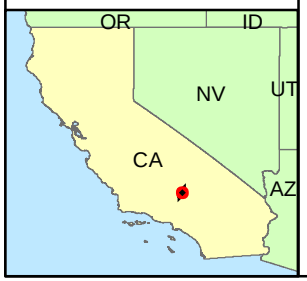
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-107.mxd



Map Location



Legend

- Predicted 1976 Water Levels
- Groundwater Contour (feet amsl) (Koehler 1976)
- Fault
- BSEP Plant Site Boundary

Note: Fault locations are approximate
Source: Koehler, 1977

0 2 4 6 8 Miles

1:253,440

BSEP

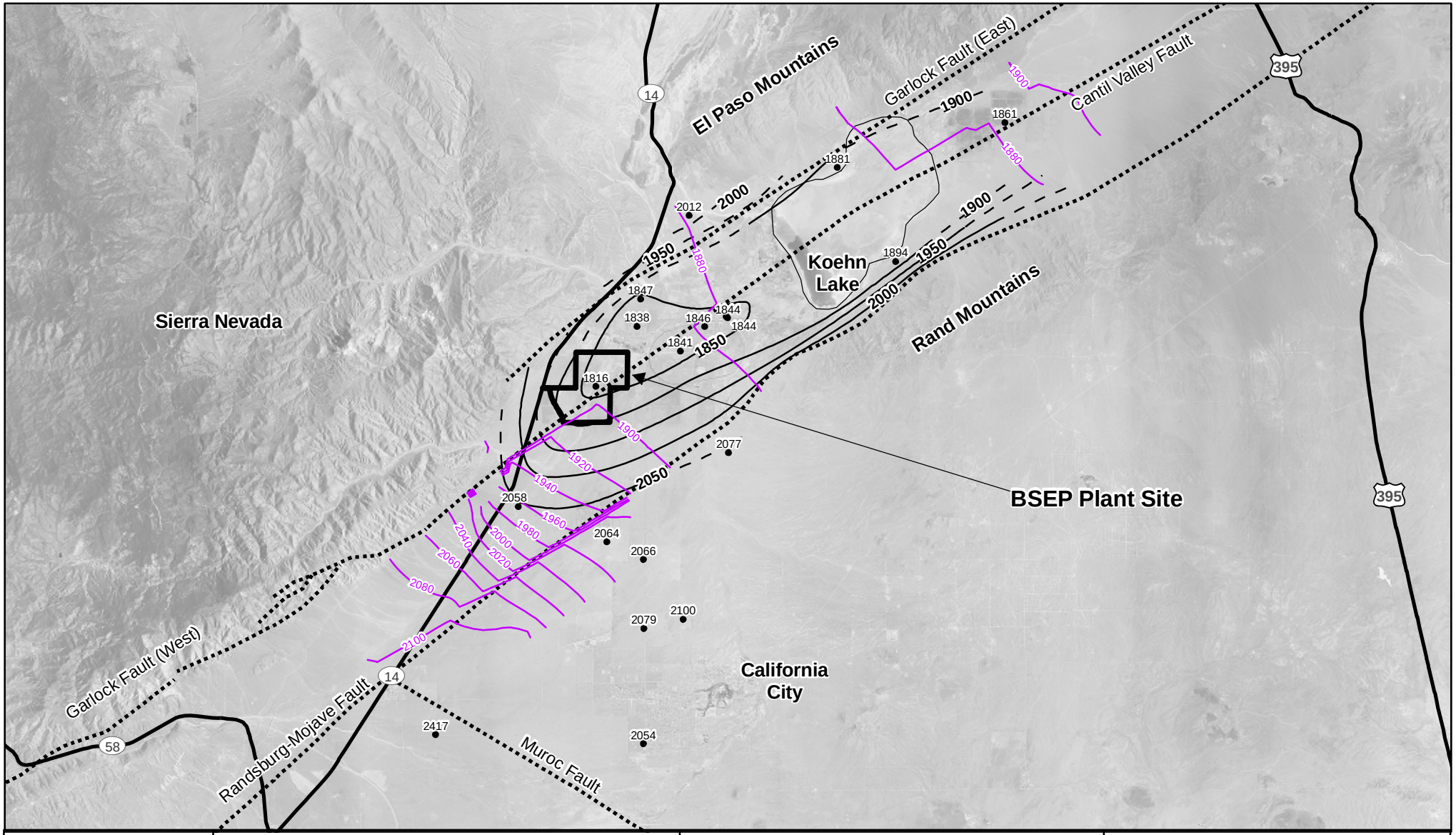
Figure DR-108
Predicted vs. Observed Water Levels (1976)

Beacon Solar

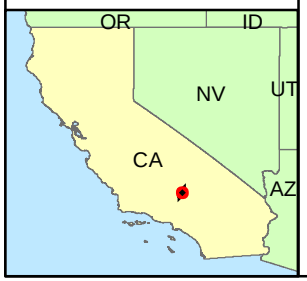
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-108.mxd



Map Location



Legend

- Wells with Water Level Data (2007)
- Predicted 2007 Water Levels
- Groundwater Contour (feet amsl)
- Dashed where Inferred
- Fault
- BSEP Plant Site Boundary

Note: Fault locations are approximate

0 2 4 6 8 Miles

1:253,440

N W E S

BSEP

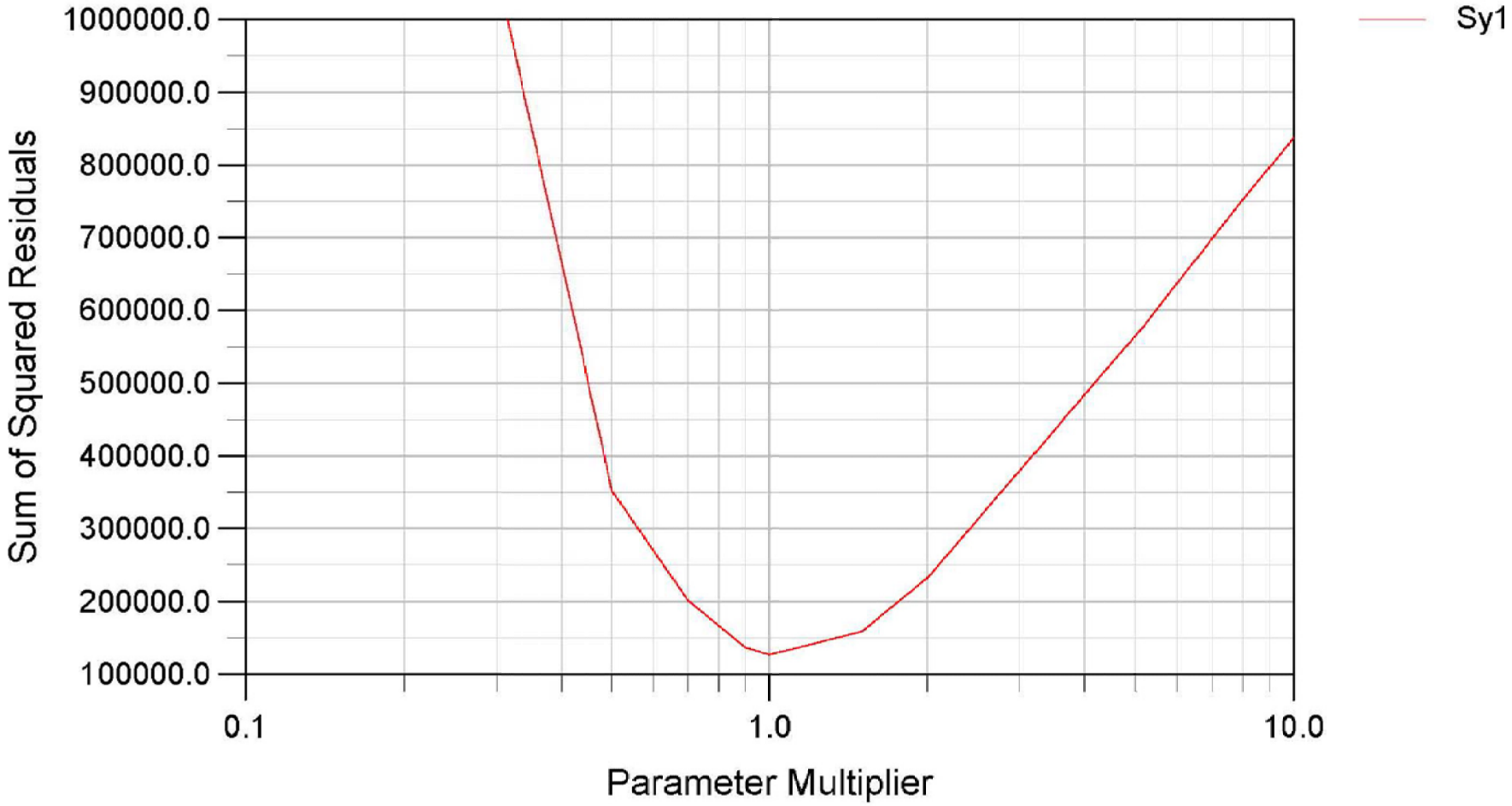
Figure DR-109
Predicted vs. Observered
Water Levels (2007)

Beacon Solar

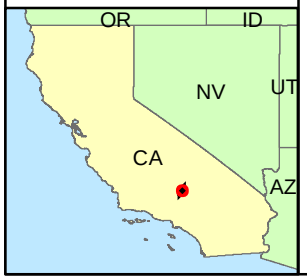
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-109.mxd



Map Location



BSEP

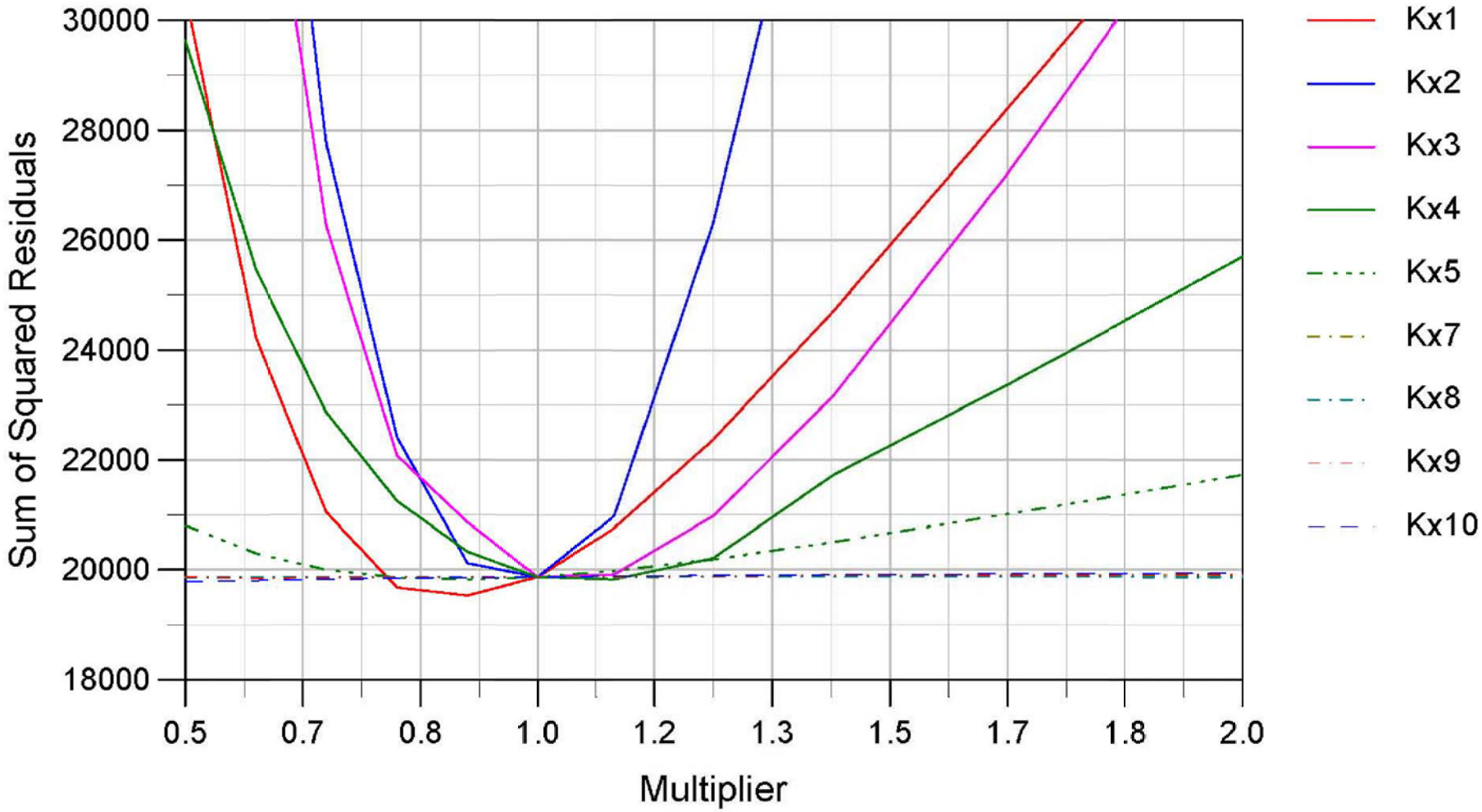
Figure DR-114a
Specific Yield
Sensitivity Analysis

Beacon Solar

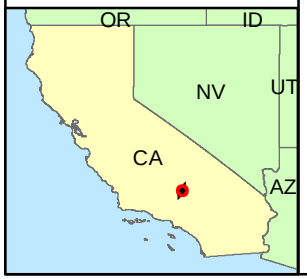
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-114a.mxd



Map Location



BSEP

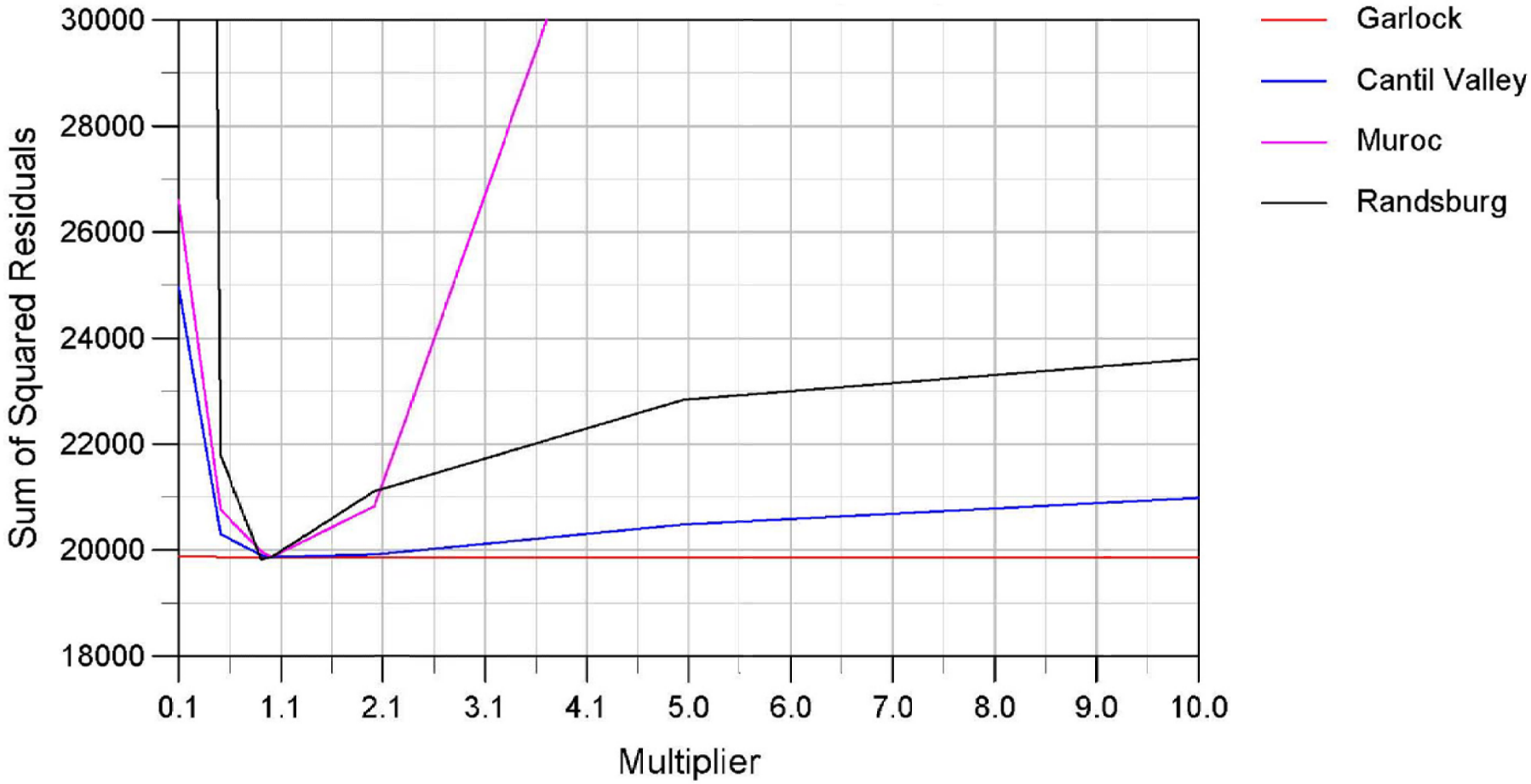
Figure DR-114b
Hydraulic Conductivity (K)
Sensitivity Analysis

Beacon Solar

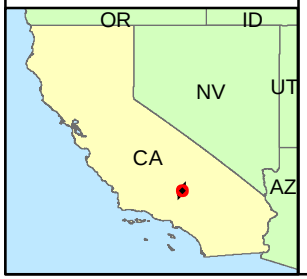
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-114b.mxd



Map Location



BSEP

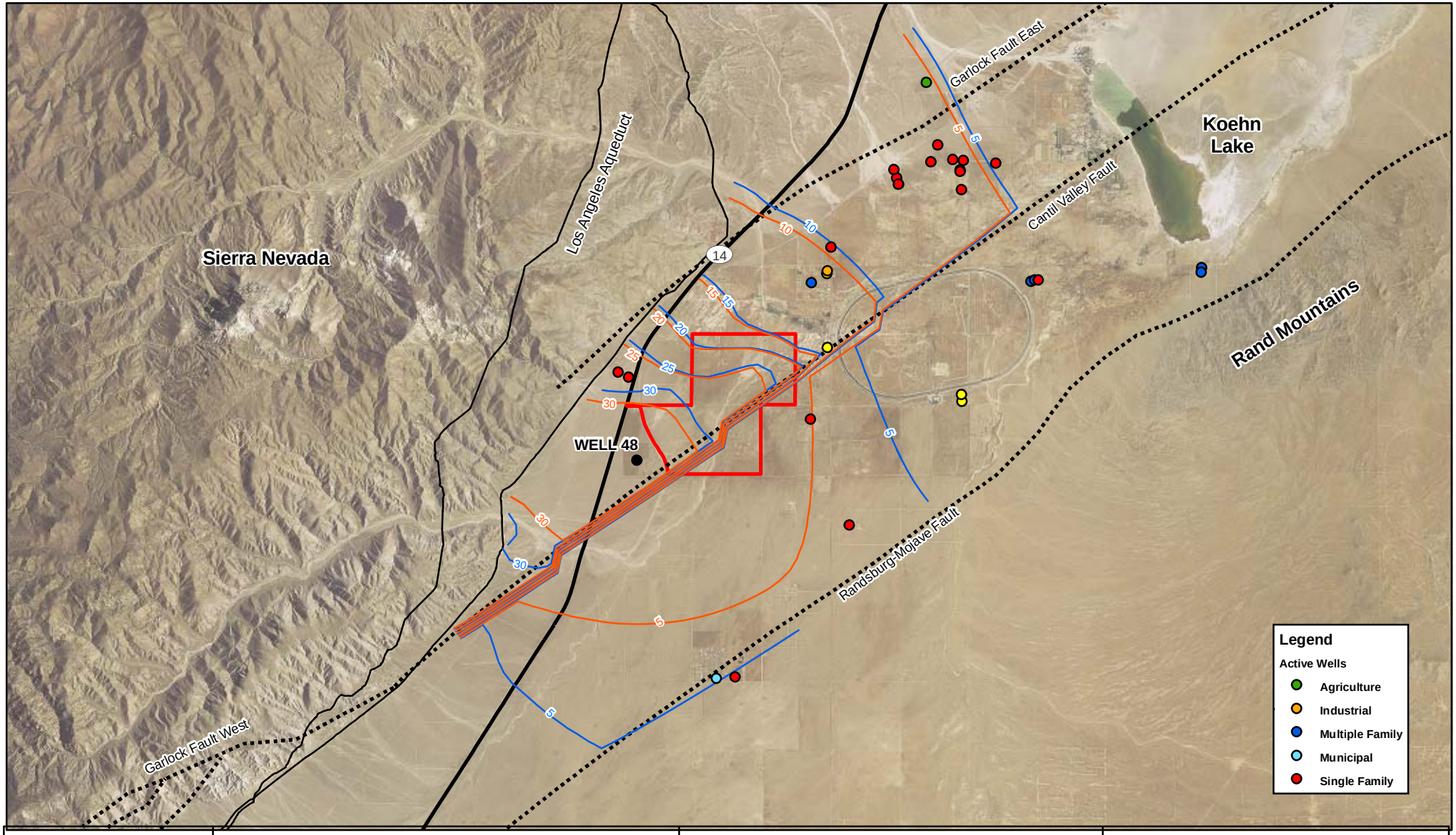
Figure DR-114c
Fault Conductance
Sensitivity Analysis

Beacon Solar

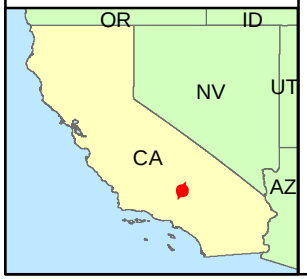
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-114c.mxd



Map Location



Legend

- Drawdown Contour Predicted from Sensitivity Analysis
- Drawdown Predicted from the Calibrated Model
- Los Angeles Aqueduct
- Fault
- BSEP Plant Site Boundary

Note: Groundwater model presented in Appendix J.2
Fault locations are approximate

0 1 2 3 4 Miles

1:126,720

N W E S

BSEP

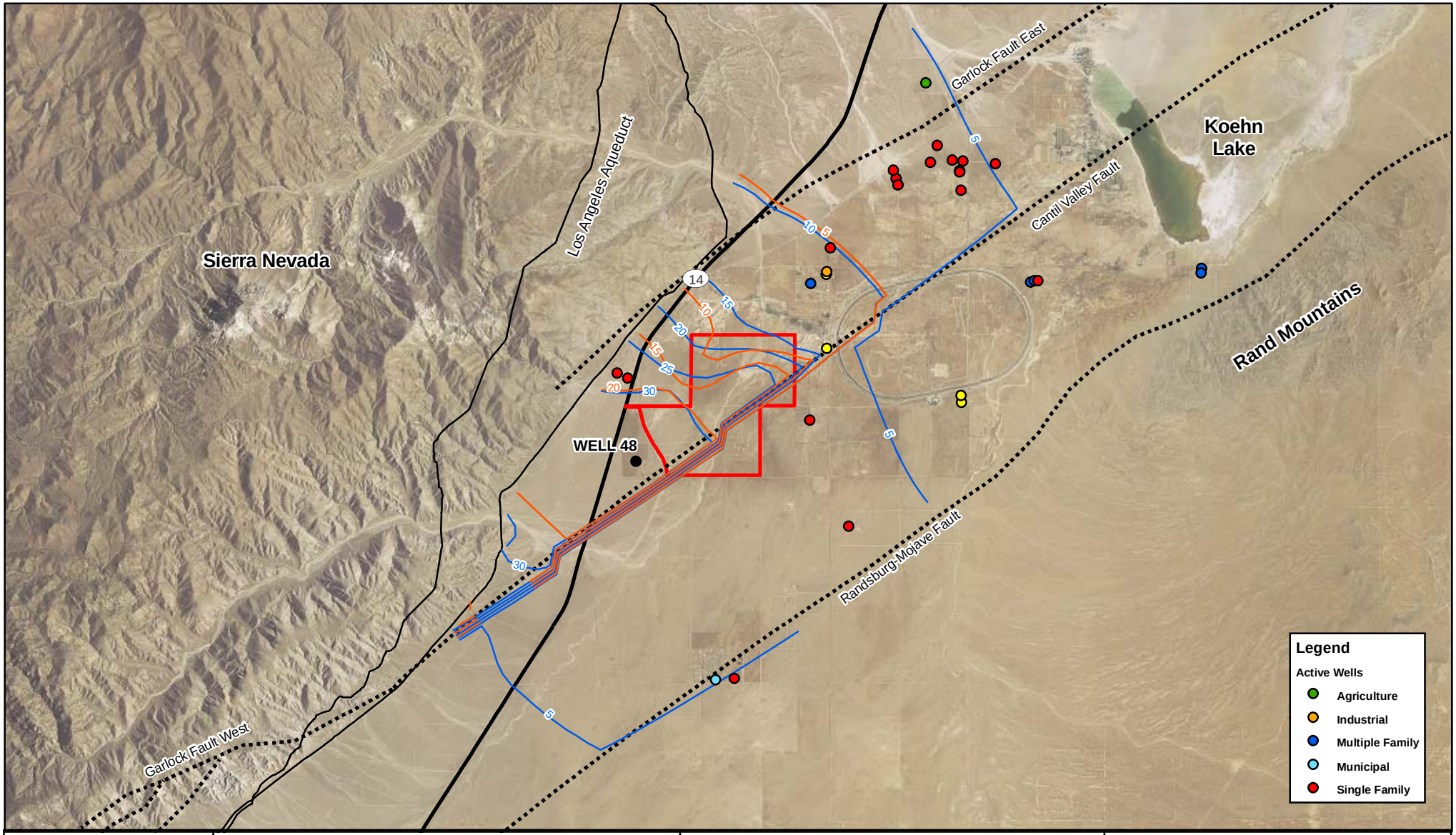
Figure DR-115a
Sensitivity Analysis
Specific Yield 1/2 Modeled Values

Beacon Solar

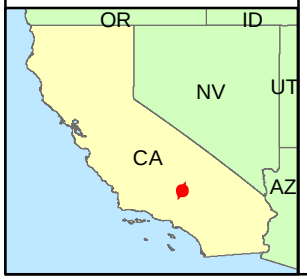
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-115a.mxd



Map Location



Legend

- Drawdown Contour Predicted from Sensitivity Analysis
- Drawdown Predicted from the Calibrated Model
- Los Angeles Aqueduct
- Fault
- BSEP Plant Site Boundary

Note: Groundwater model presented in Appendix J.2
Fault locations are approximate

0 1 2 3 4 Miles

1:126,720

BSEP

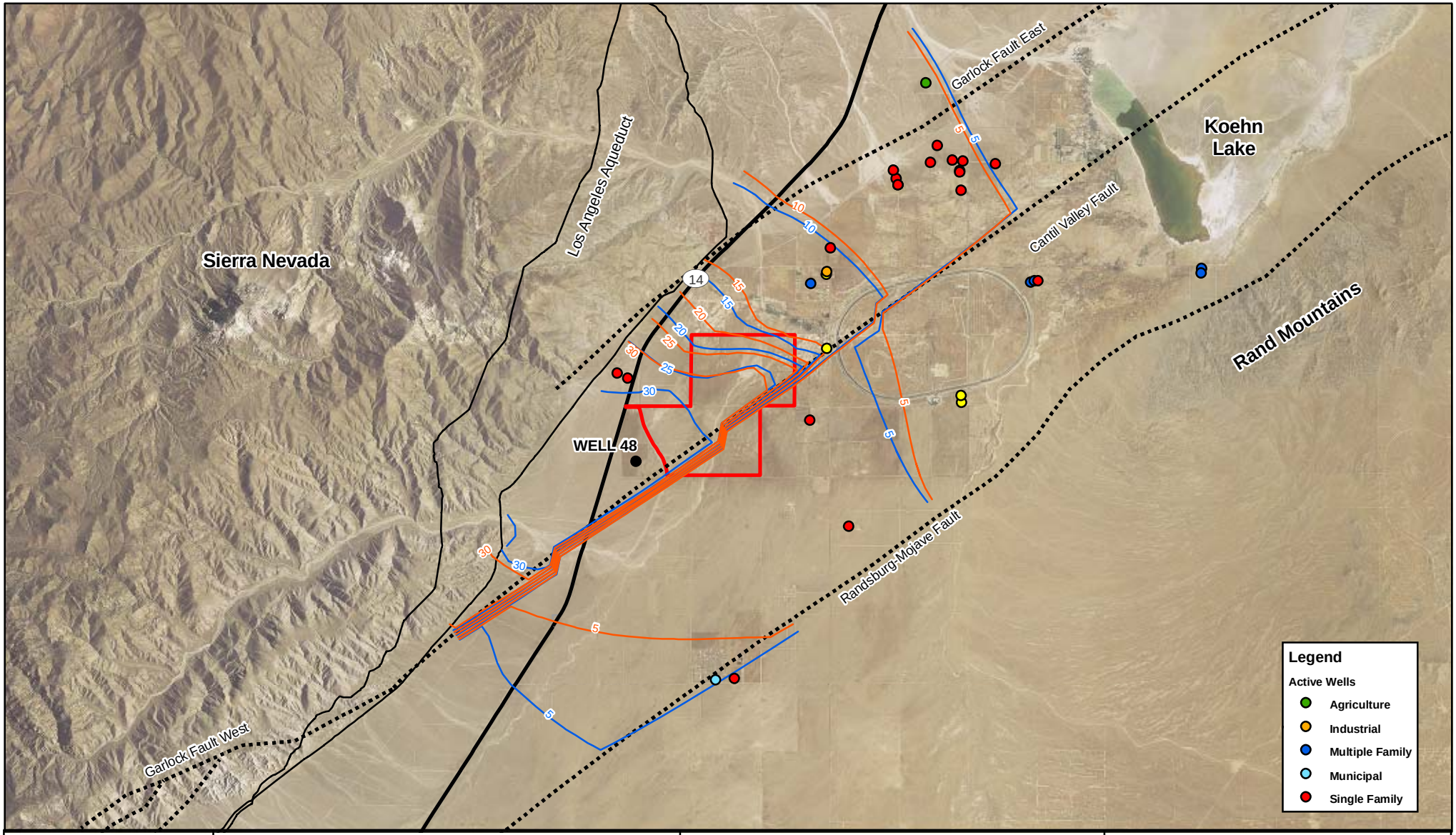
Figure DR-115b
Sensitivity Analysis
Specific Yield 2X Modeled Values

Beacon Solar

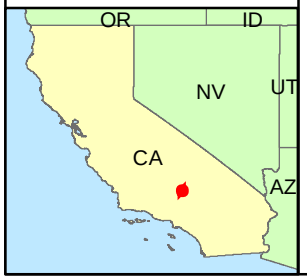
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-115b.mxd



Map Location



Legend

- Drawdown Contour Predicted from Sensitivity Analysis
- Drawdown Predicted from the Calibrated Model
- Los Angeles Aqueduct
- Fault
- BSEP Plant Site Boundary

Note: Groundwater model presented in Appendix J.2
Fault locations are approximate

0 1 2 3 4 Miles

1:126,720

BSEP

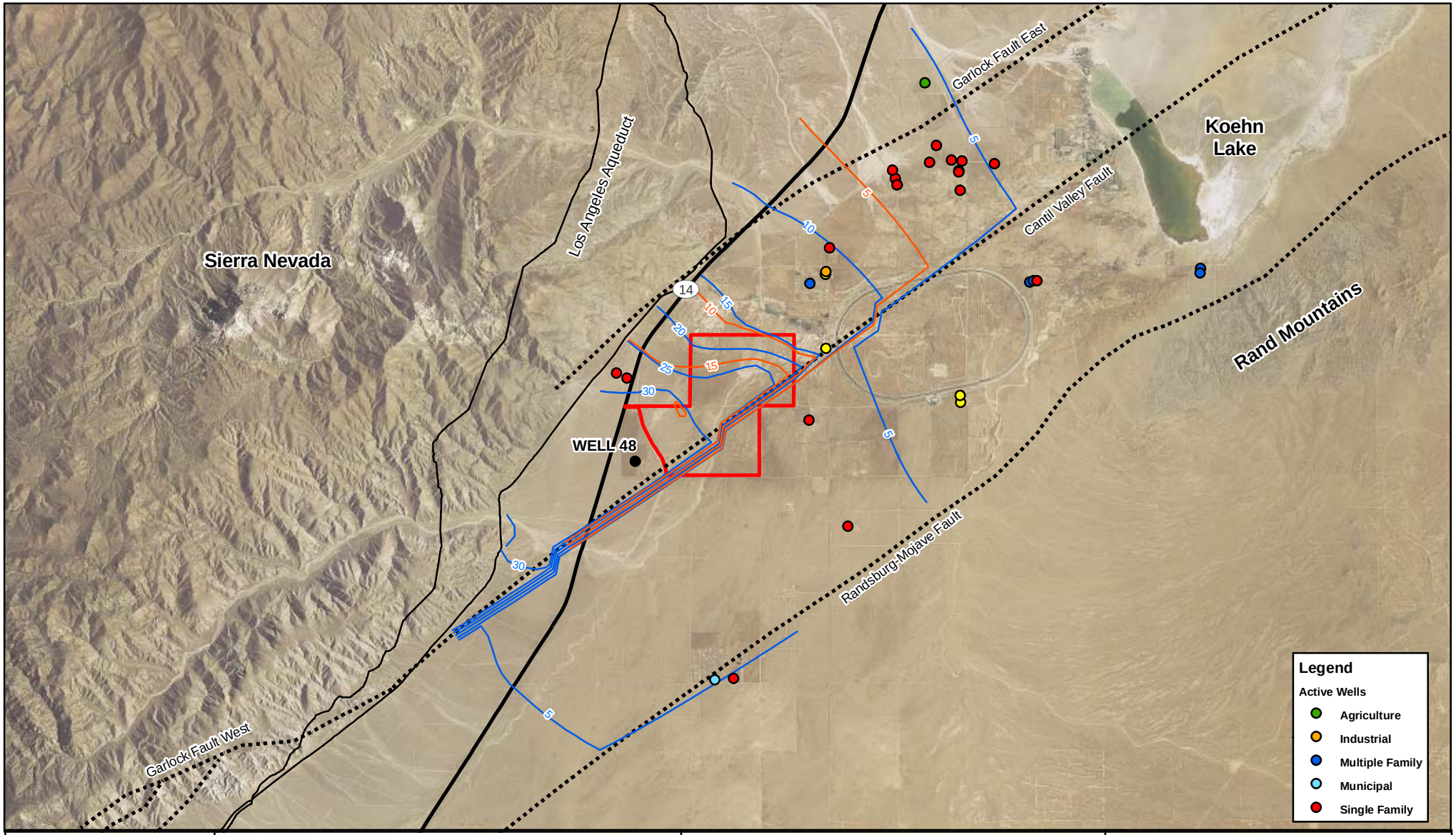
Figure DR-115c
Sensitivity Analysis
Hydraulic Conductivity
1/2 Modeled Values

Beacon Solar

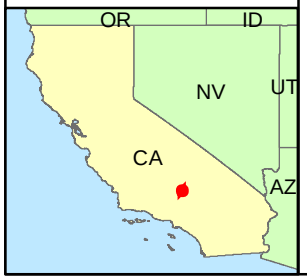
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-115c.mxd



Map Location



Legend

- Drawdown Contour Predicted from Sensitivity Analysis
- Drawdown Predicted from the Calibrated Model
- Los Angeles Aqueduct
- Fault
- BSEP Plant Site Boundary

Note: Groundwater model presented in Appendix J.2
Fault locations are approximate

0 1 2 3 4 Miles

1:126,720

N W E S

BSEP

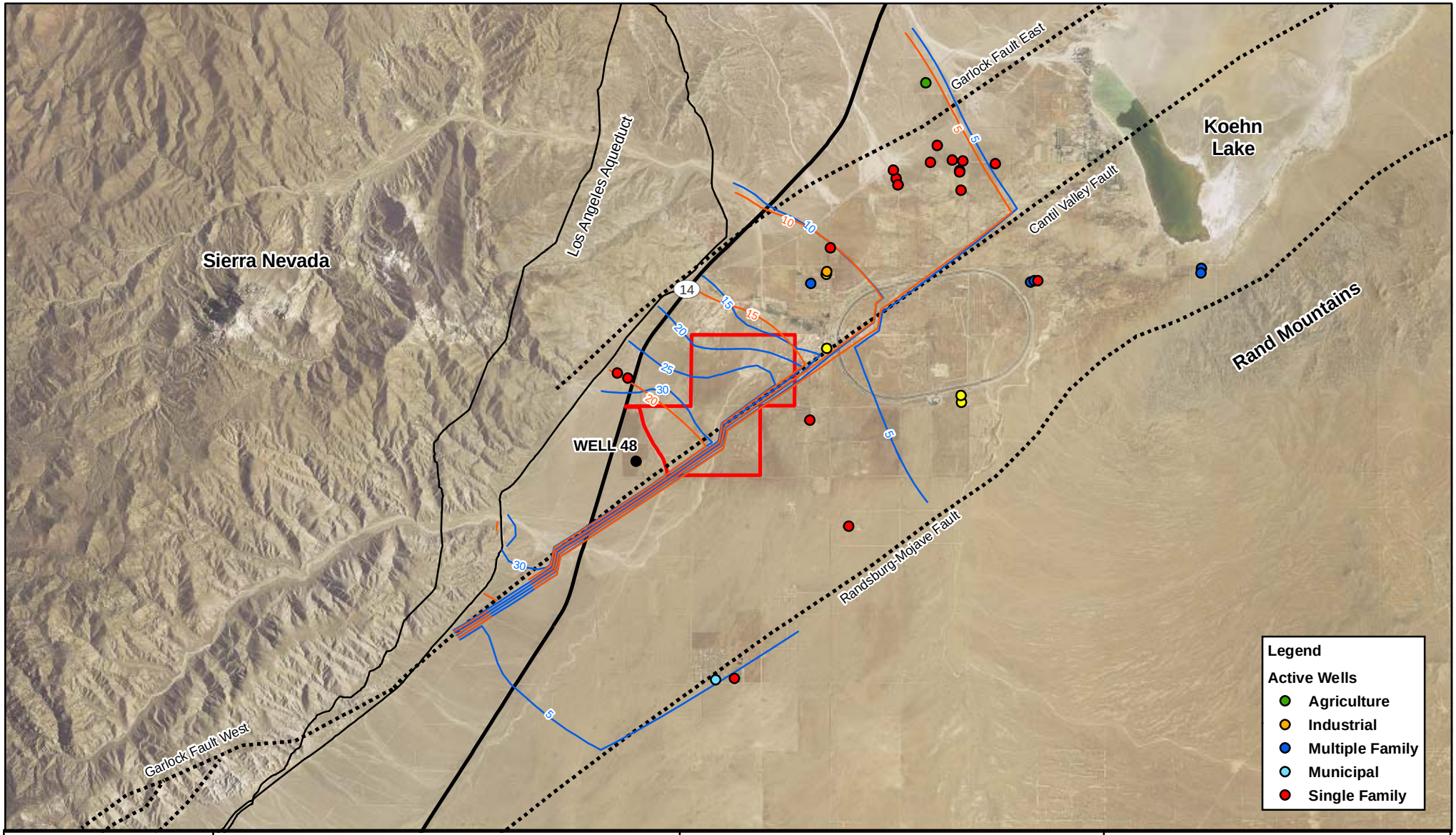
Figure DR-115d
Sensitivity Analysis
Hydraulic Conductivity
2X Modeled Values

Beacon Solar

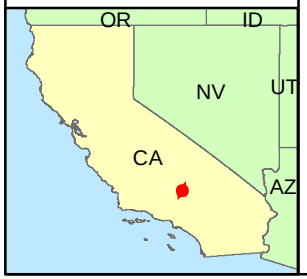
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-115d.mxd



Map Location



Legend

- Drawdown Contour Predicted from Sensitivity Analysis
- Drawdown Predicted from the Calibrated Model
- Los Angeles Aqueduct
- Fault
- BSEP Plant Site Boundary

Note: Groundwater model presented in Appendix J.2
Fault locations are approximate

0 1 2 3 4 Miles

1:126,720

N W E S

BSEP

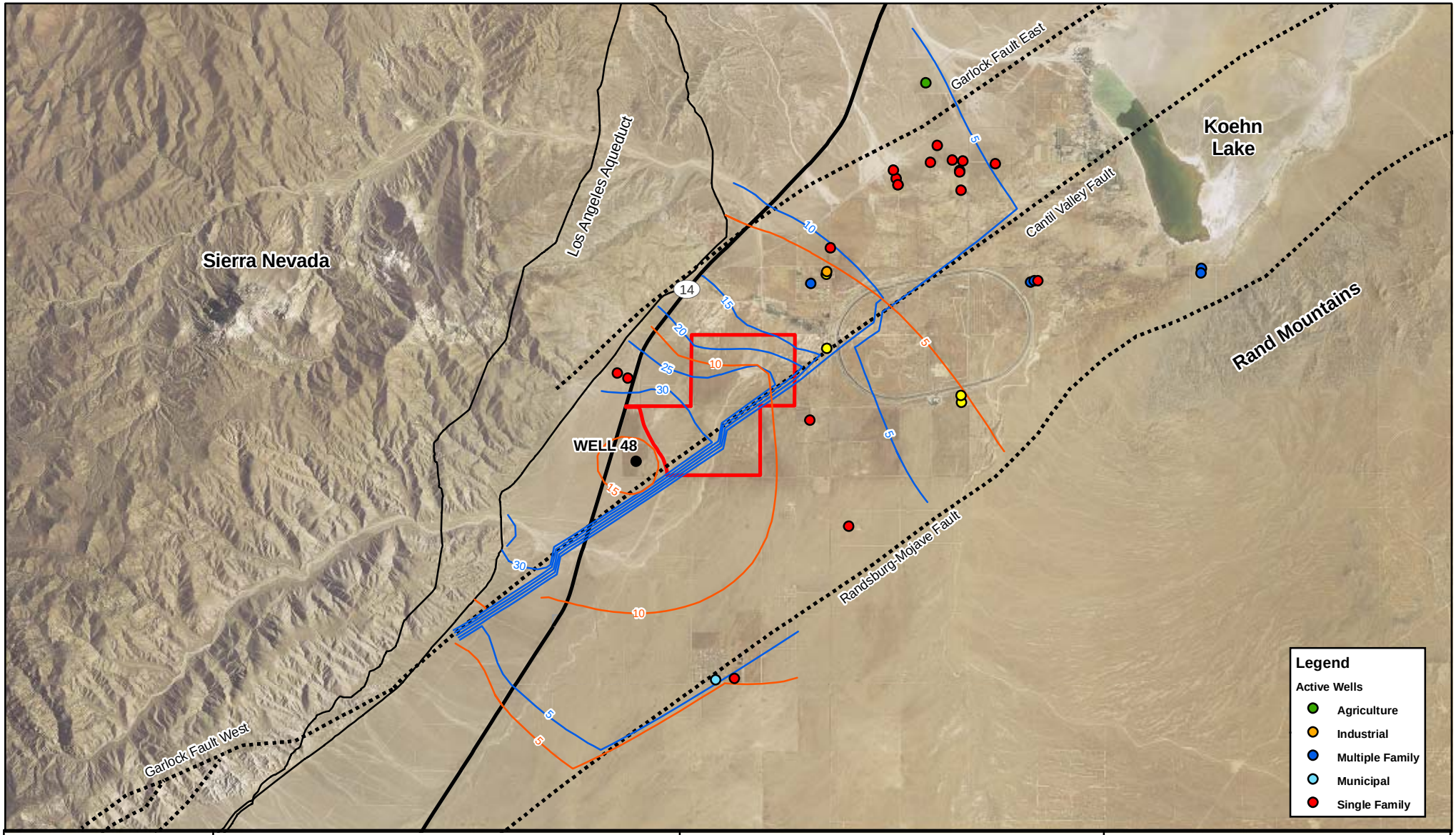
Figure DR-115e
Sensitivity Analysis
Hydraulic Conductivity Zone 2
Removed

Beacon Solar

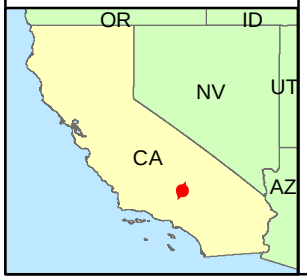
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-115e.mxd



Map Location



Legend

- Drawdown Contour Predicted from Sensitivity Analysis
- Drawdown Predicted from the Calibrated Model
- Los Angeles Aqueduct
- Fault
- BSEP Plant Site Boundary

Note: Groundwater model presented in Appendix J.2
Fault locations are approximate

0 1 2 3 4 Miles

1:126,720

N W E S

BSEP

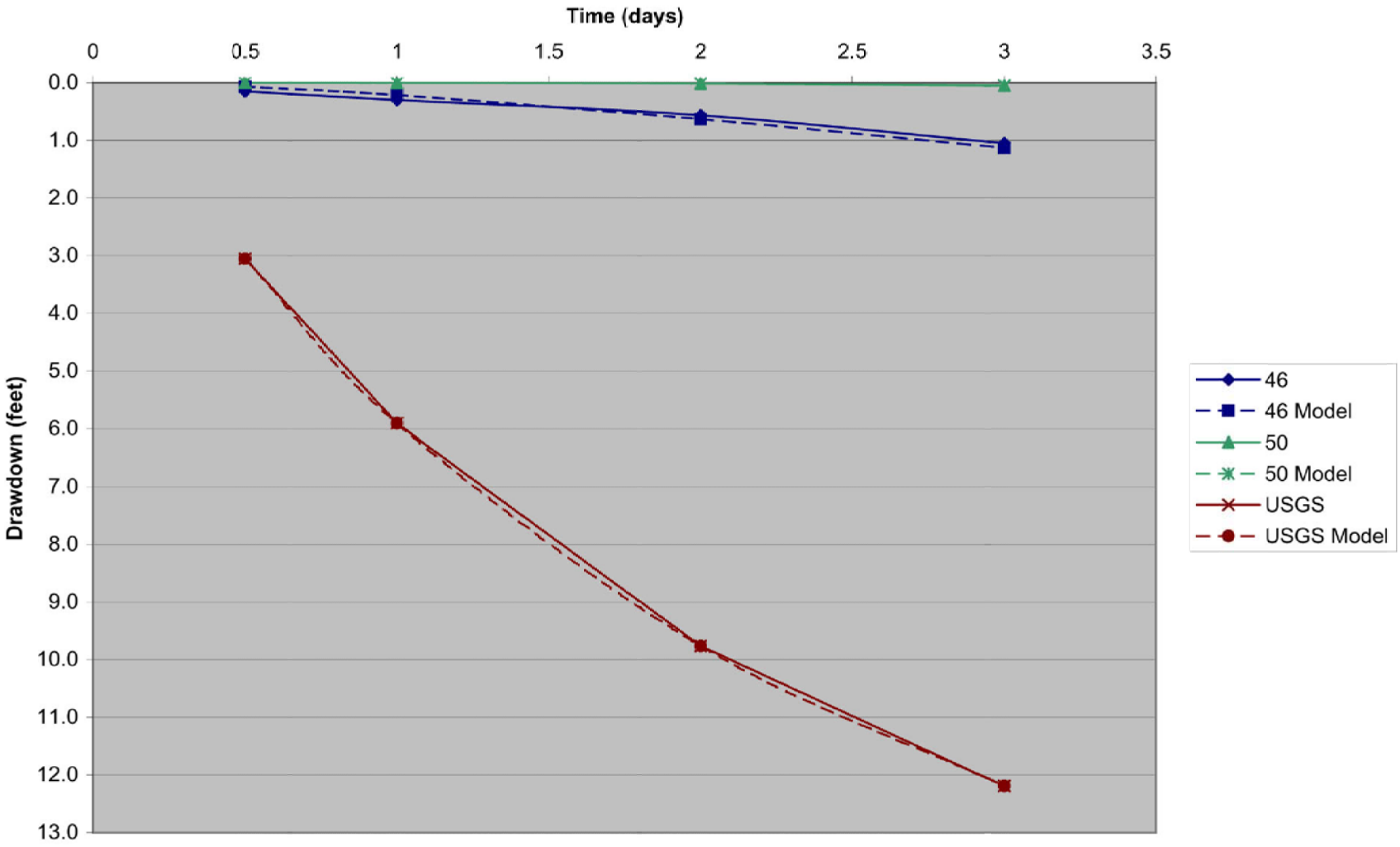
Figure DR-115f
Sensitivity Analysis
Fault Conductance -
Fault Removed

Beacon Solar

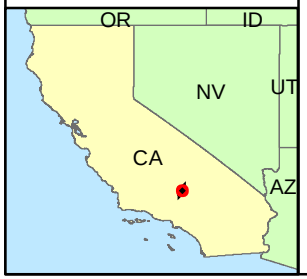
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-115f.mxd



Map Location



BSEP

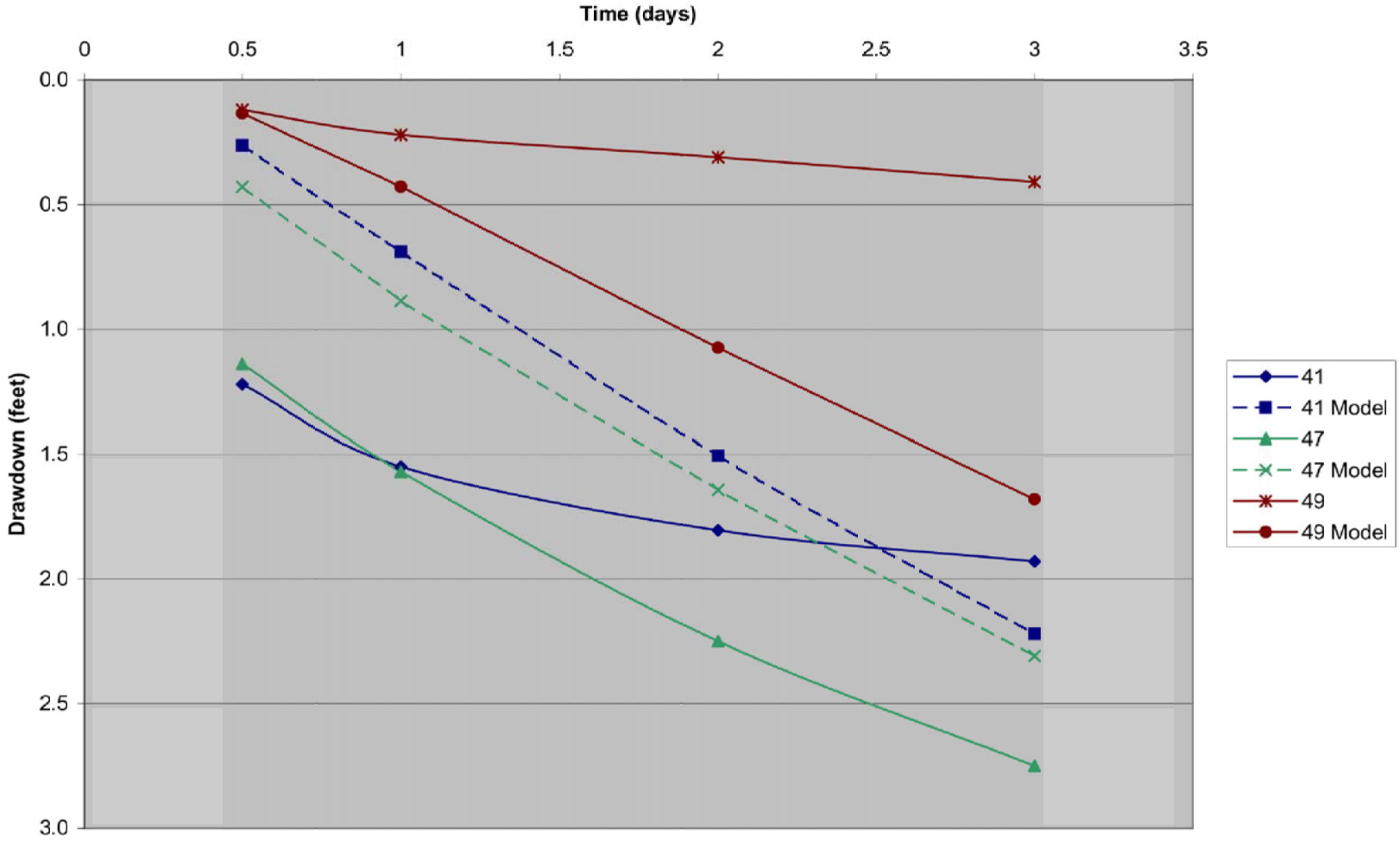
Figure DR-119a
Transient Calibration
Well No. 43

Beacon Solar

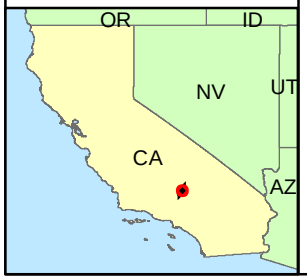
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-119a.mxd



Map Location



BSEP

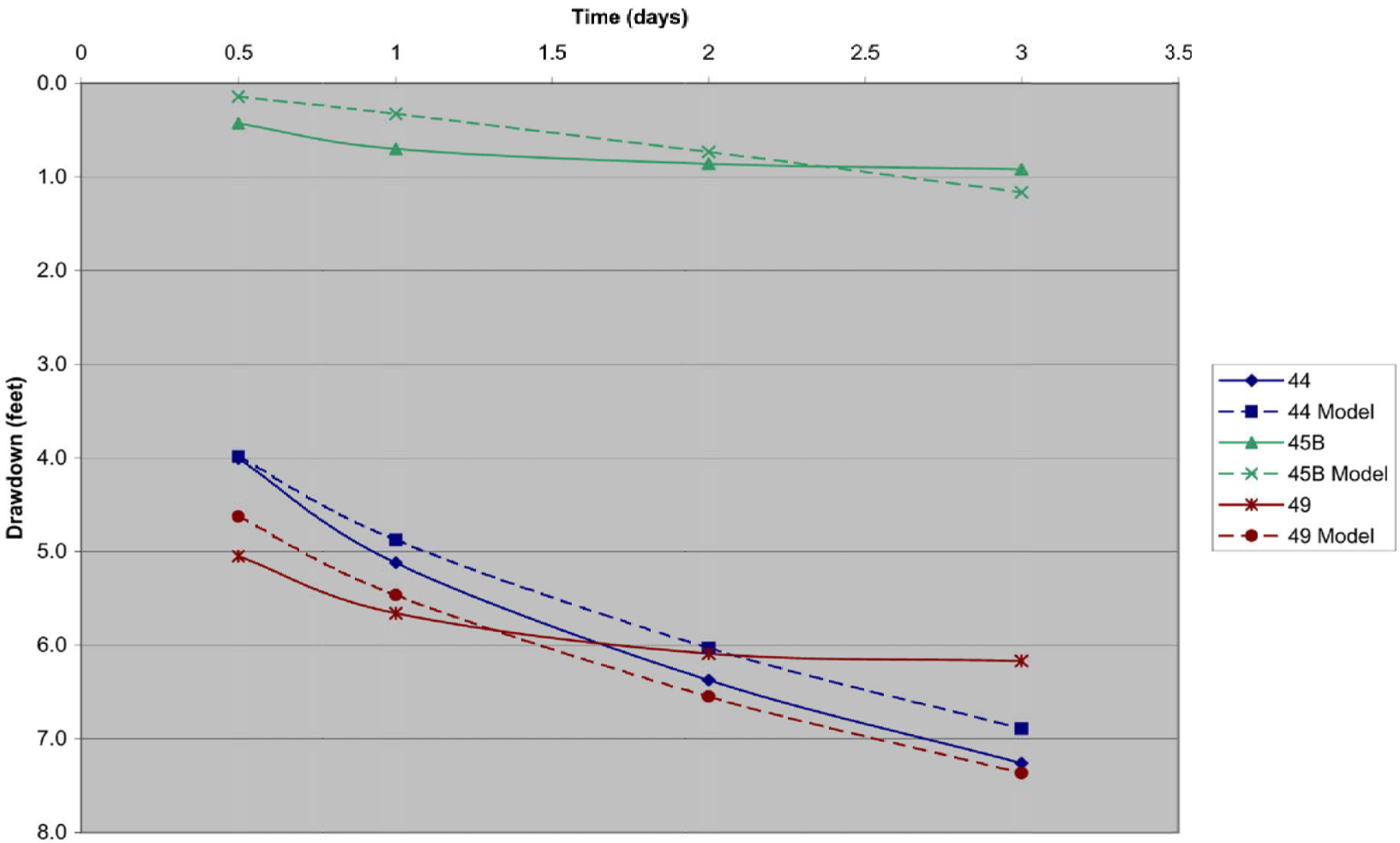
Figure DR-119b
Transient Calibration
Well No. 48

Beacon Solar

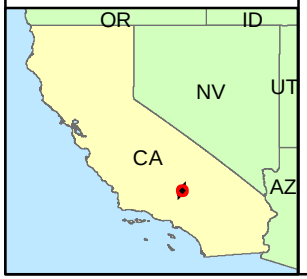
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-119b.mxd



Map Location



BSEP

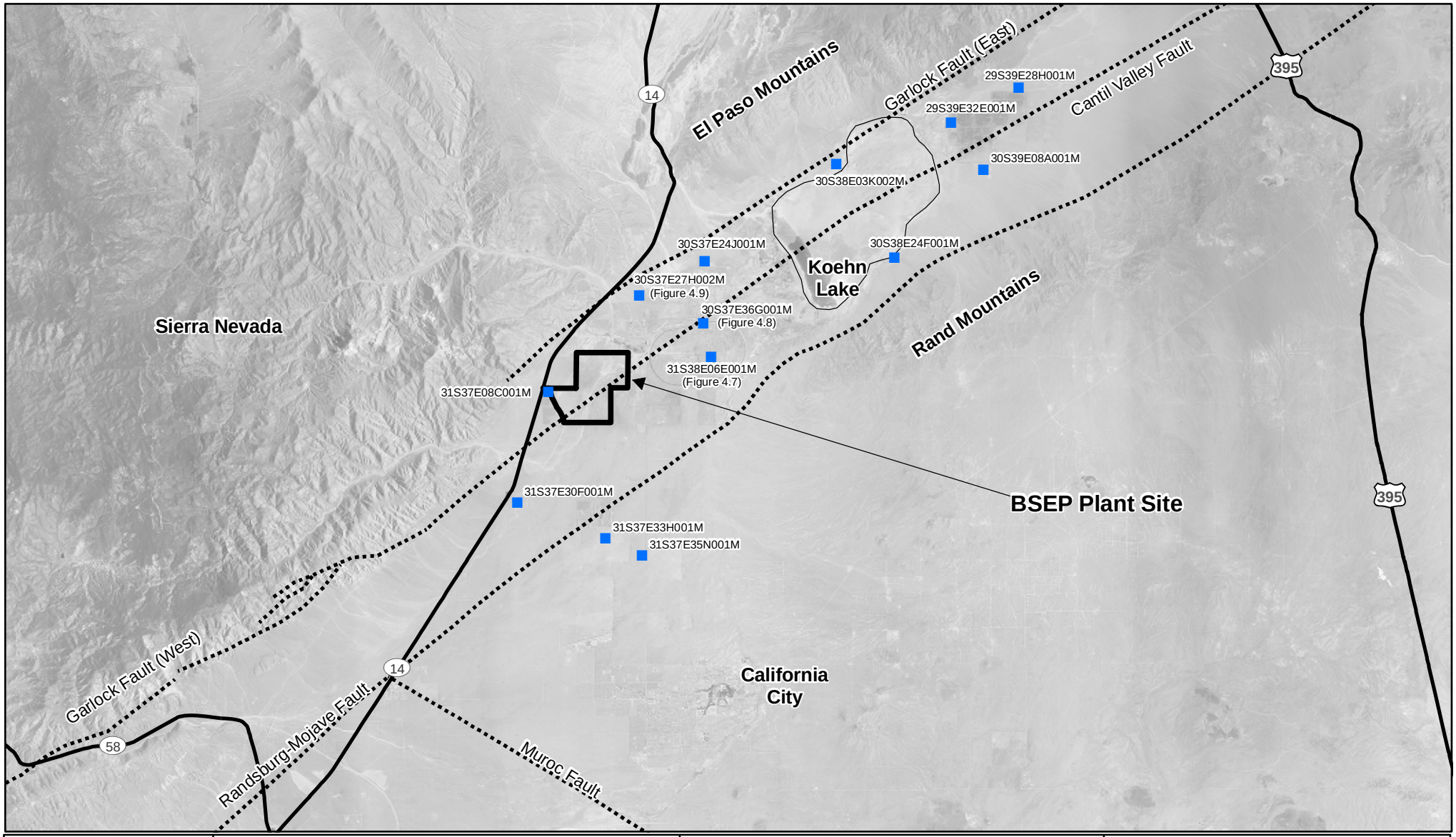
Figure DR-119c
Transient Calibration
Well No. 63

Beacon Solar

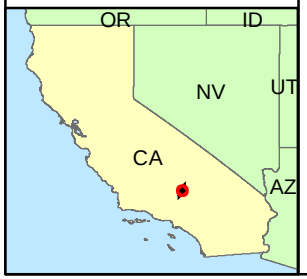
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-119c.mxd



Map Location



Legend

- Model Verification Well Locations
- **Fault**
- **BSEP Plant Site Boundary**
- **(Figure 4.7) Wells in Original Report**

Note: Fault locations are approximate

0 2 4 6 8 Miles

1:253,440

N W E S

BSEP

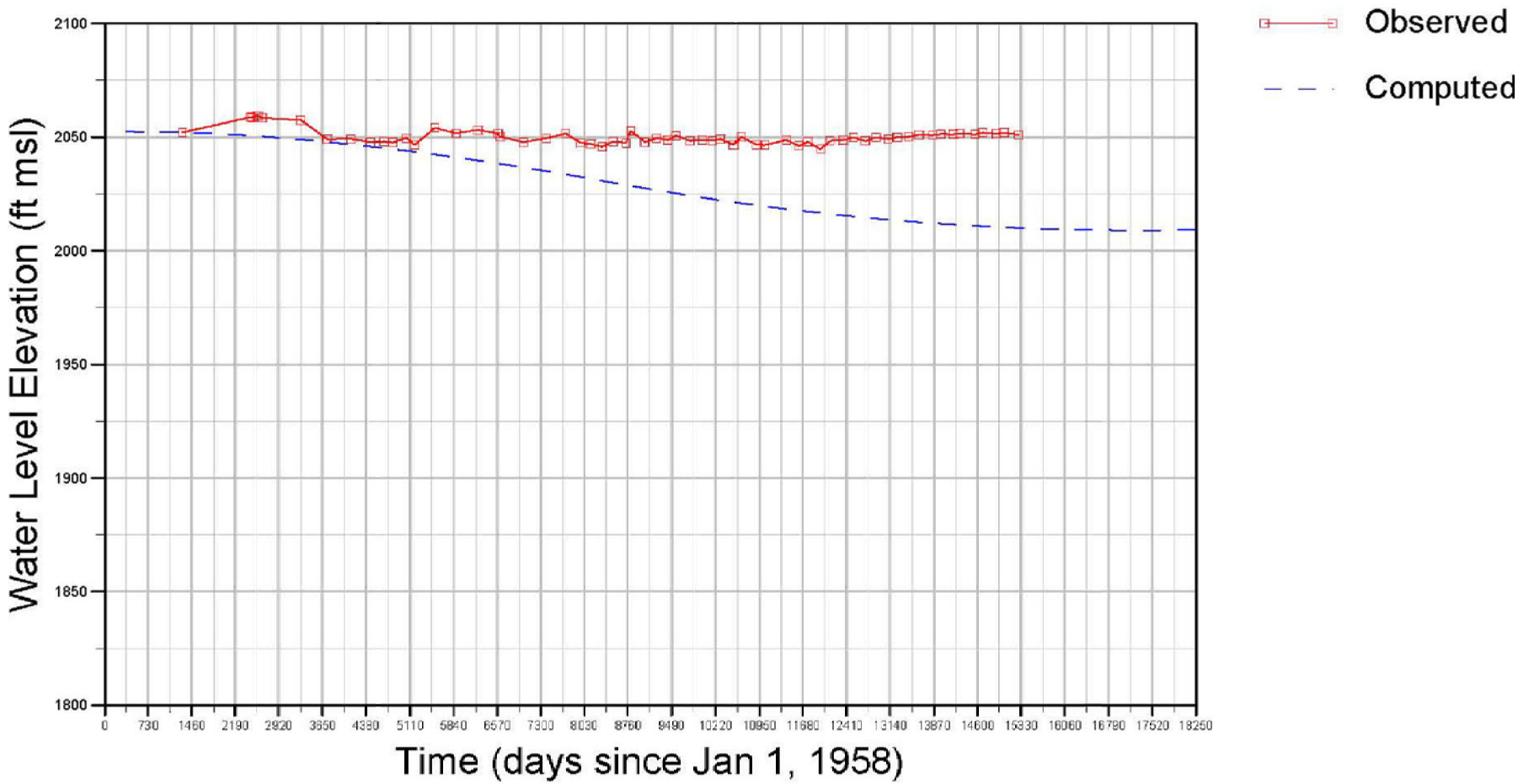
Figure DR-121a
Model Verification
Well Locations

Beacon Solar

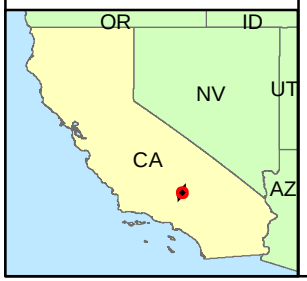
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-121a.mxd



Map Location



BSEP

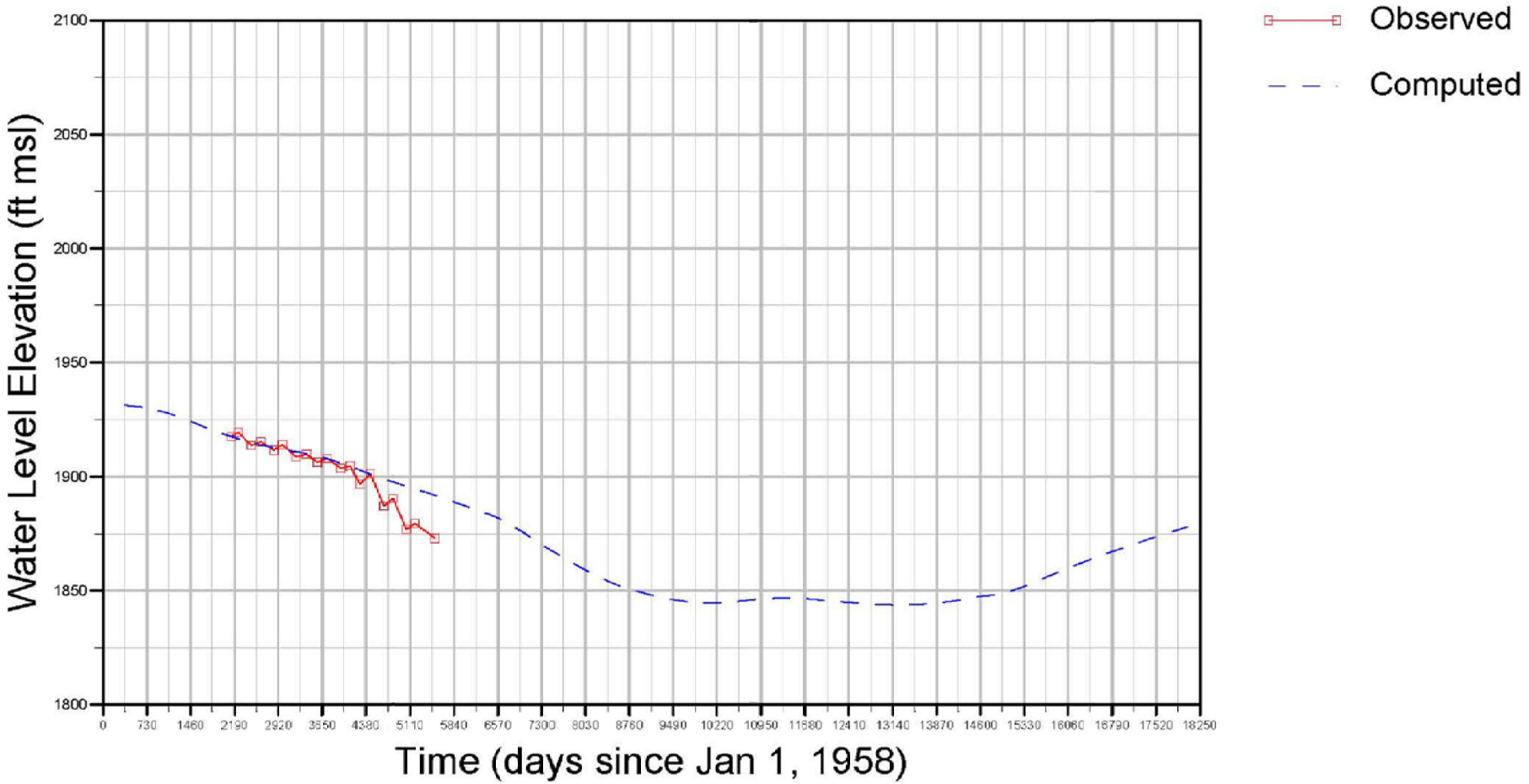
Figure DR-121b
Model Verification
Hydrograph for 31S37E33H001M

Beacon Solar

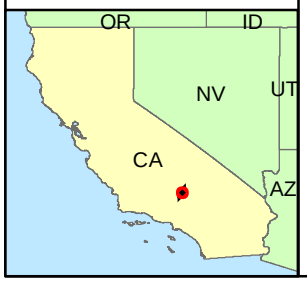
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-121b.mxd



Map Location



BSEP

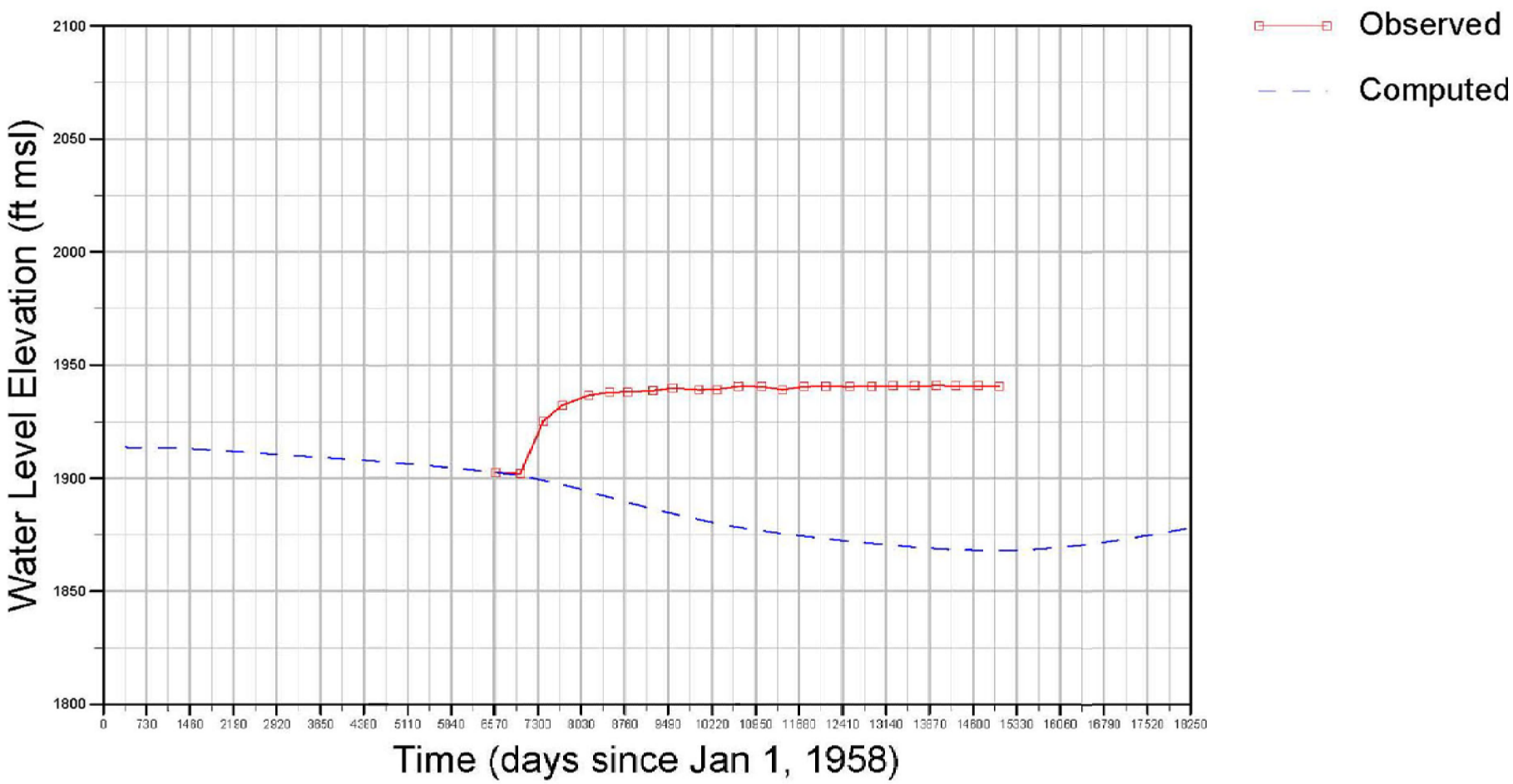
Figure DR-121c
Model Verification
Hydrograph for 30S37E24J001M

Beacon Solar

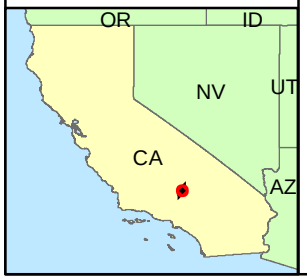
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-121C.mxd



Map Location



BSEP

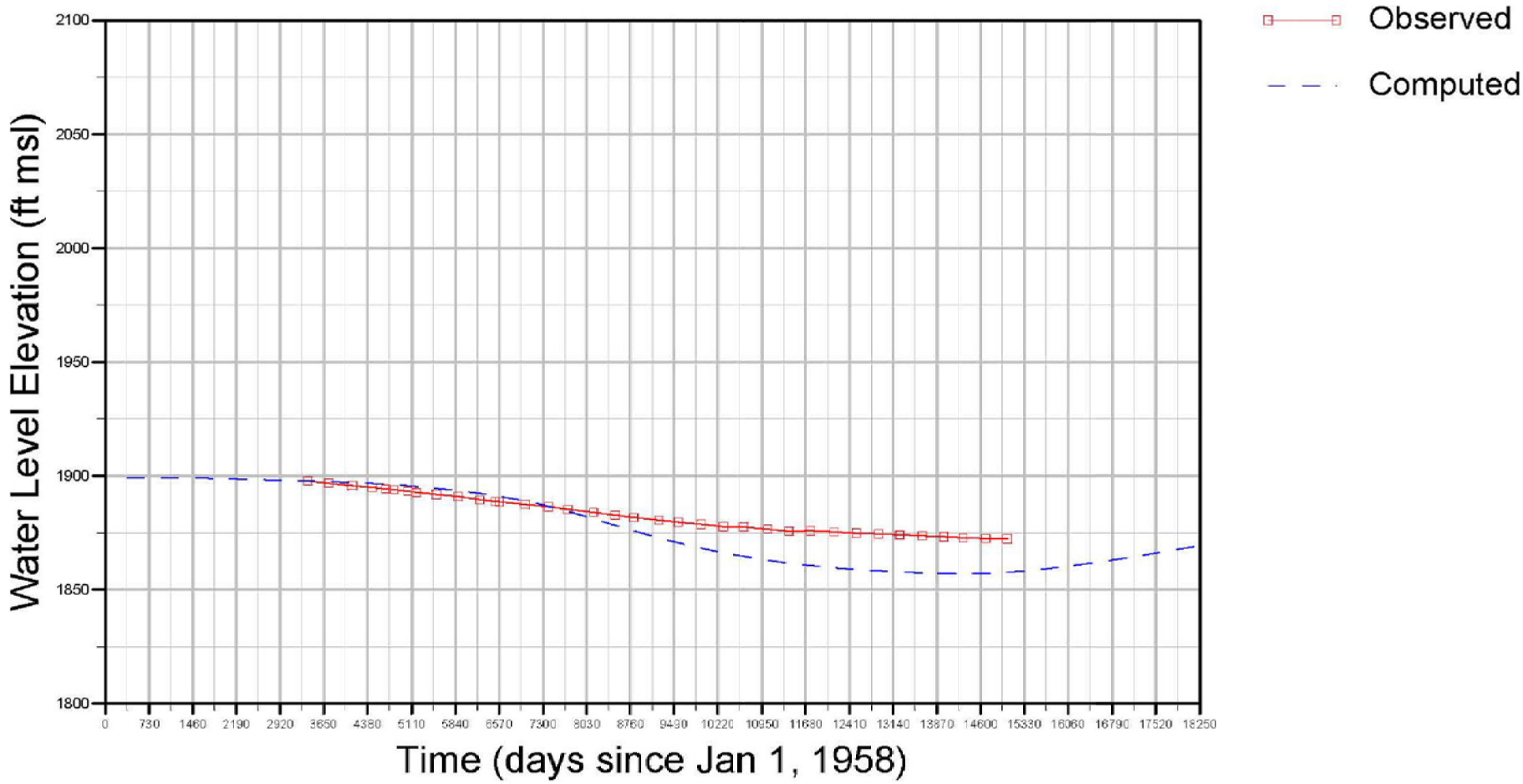
Figure DR-121d
Model Verification
Hydrograph for 30S38E03K002M

Beacon Solar

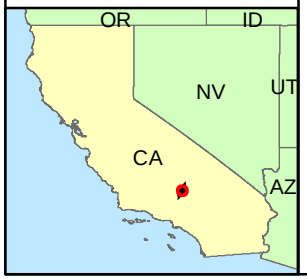
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-121d.mxd



Map Location



BSEP

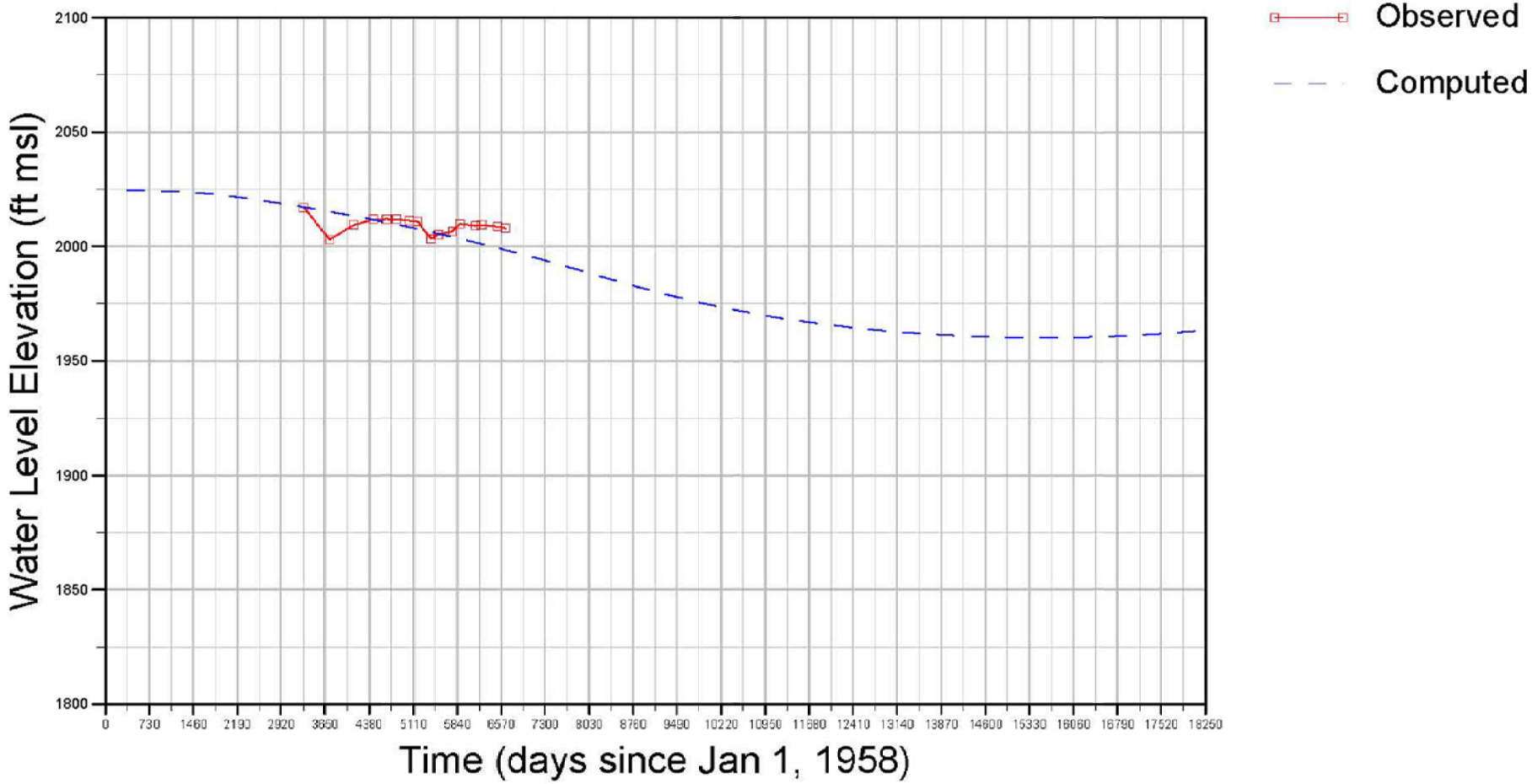
Figure DR-121e
Model Verification
Hydrograph for 30S38E24F001M

Beacon Solar

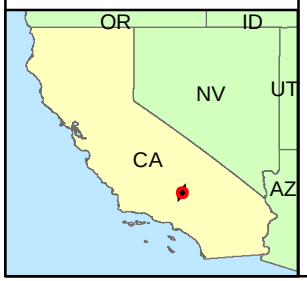
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-121e.mxd



Map Location



BSEP

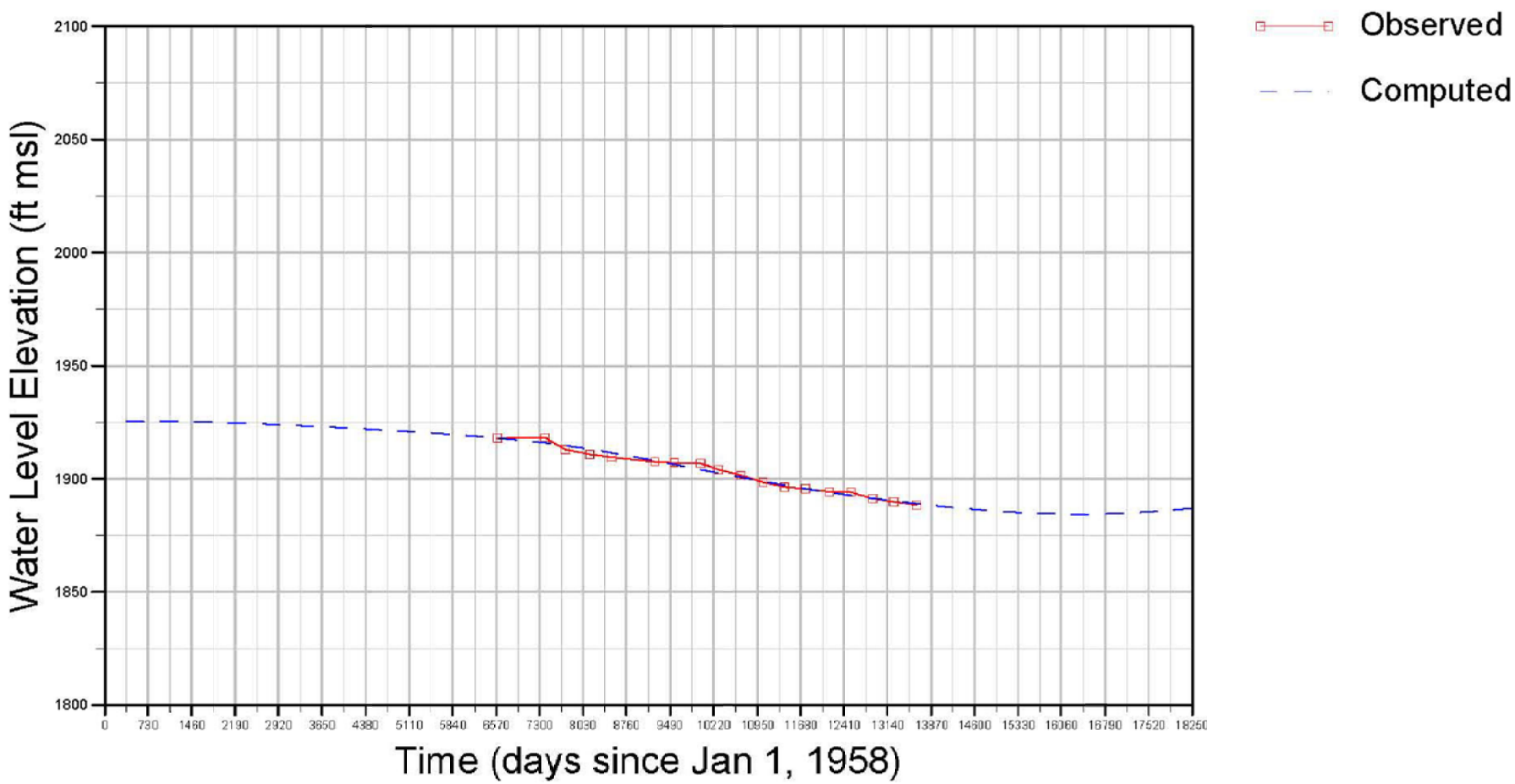
Figure DR-121f
Model Verification
Hydrograph for 31S37E30F001M

Beacon Solar

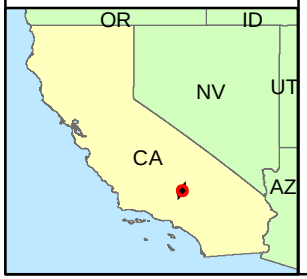
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-121f.mxd



Map Location



BSEP

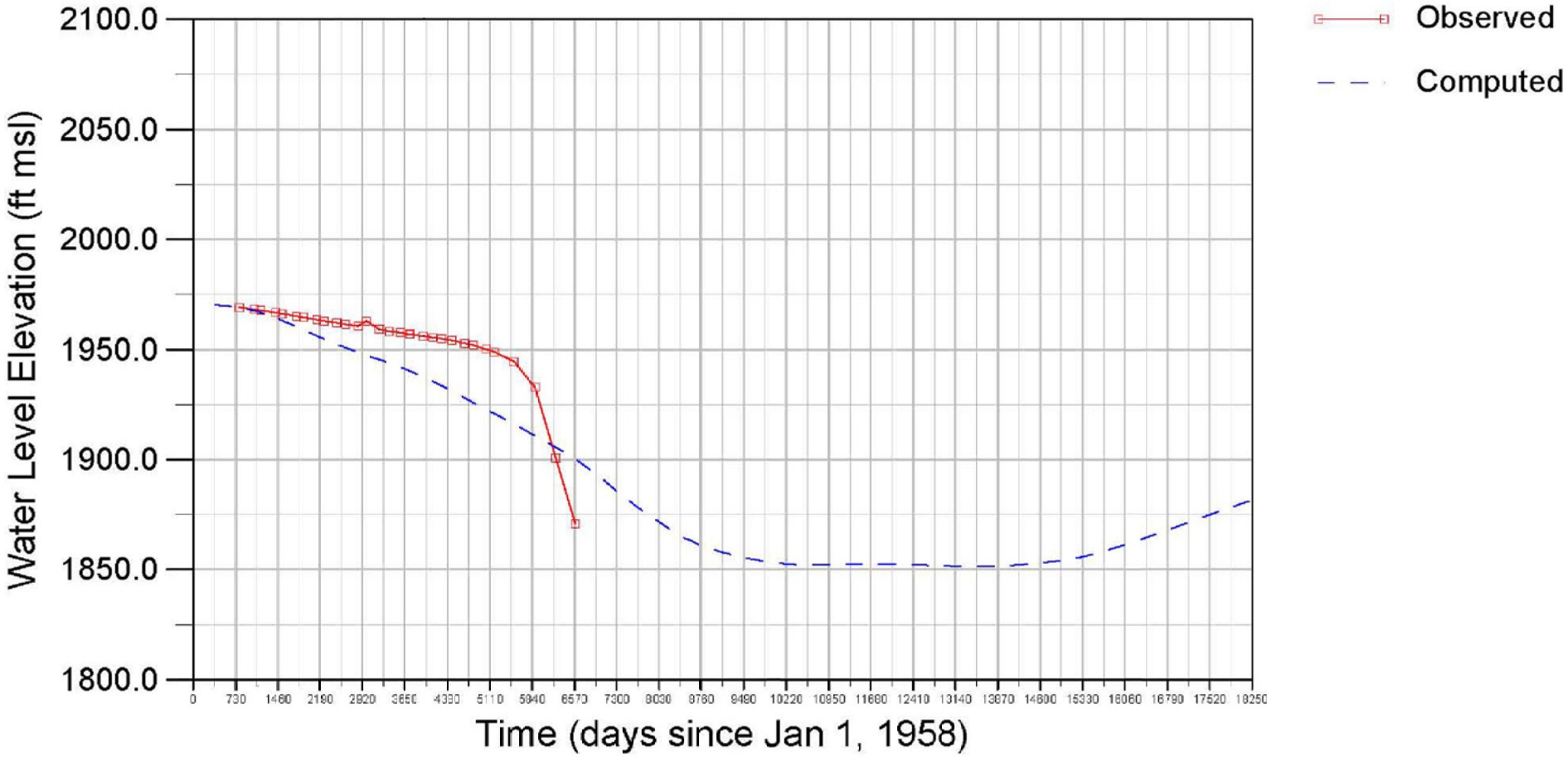
Figure DR-121g
Model Verification
Hydrograph for 29S39E32E001M

Beacon Solar

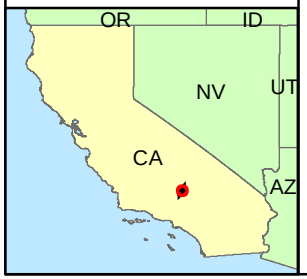
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-121g.mxd



Map Location



BSEP

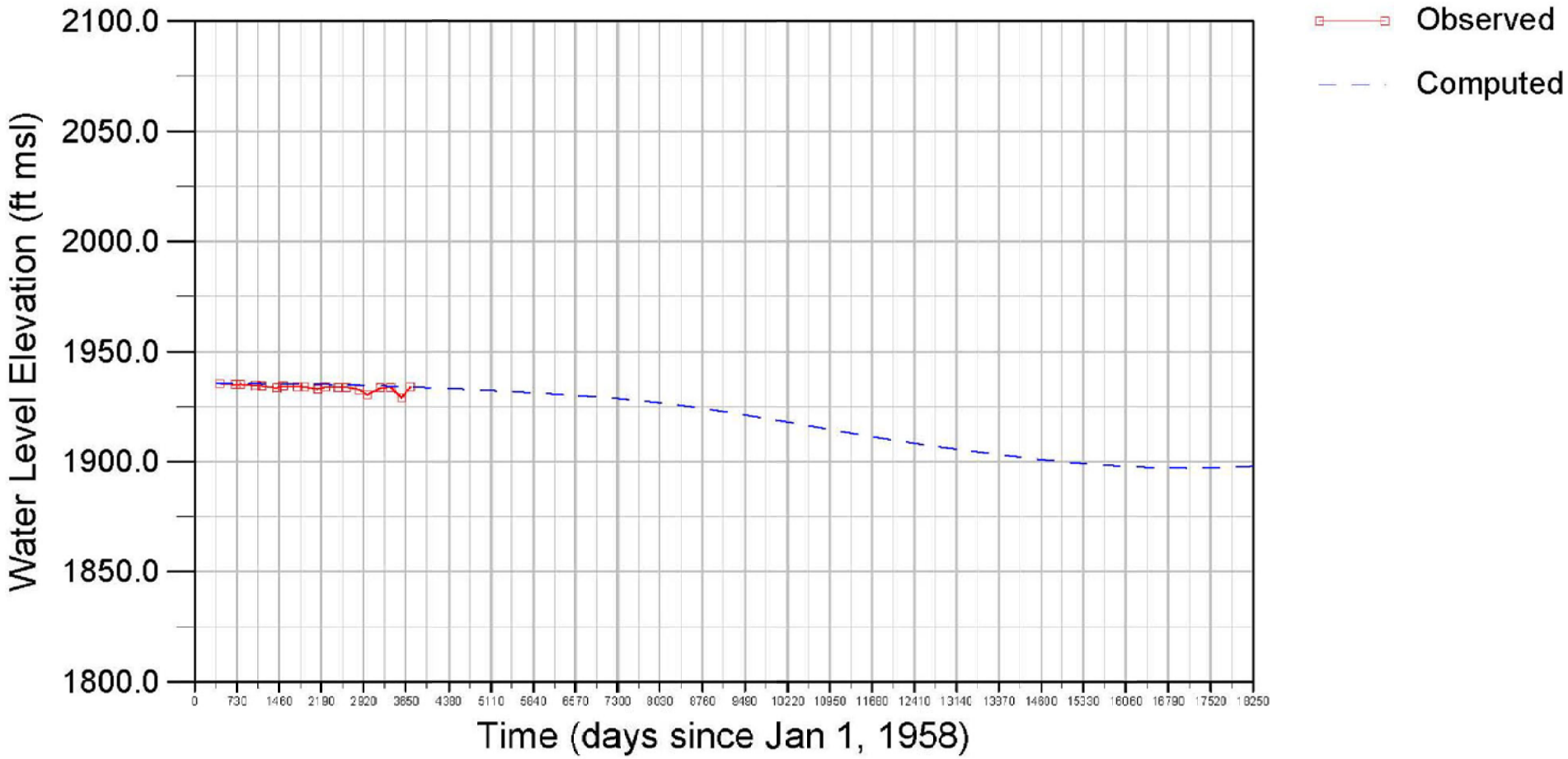
Figure DR-121h
Model Verification
Hydrograph for 31S37E08C001M

Beacon Solar

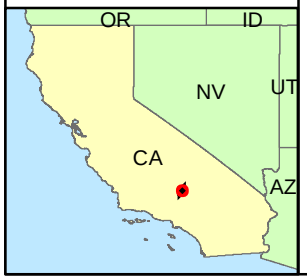
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-121h.mxd



Map Location



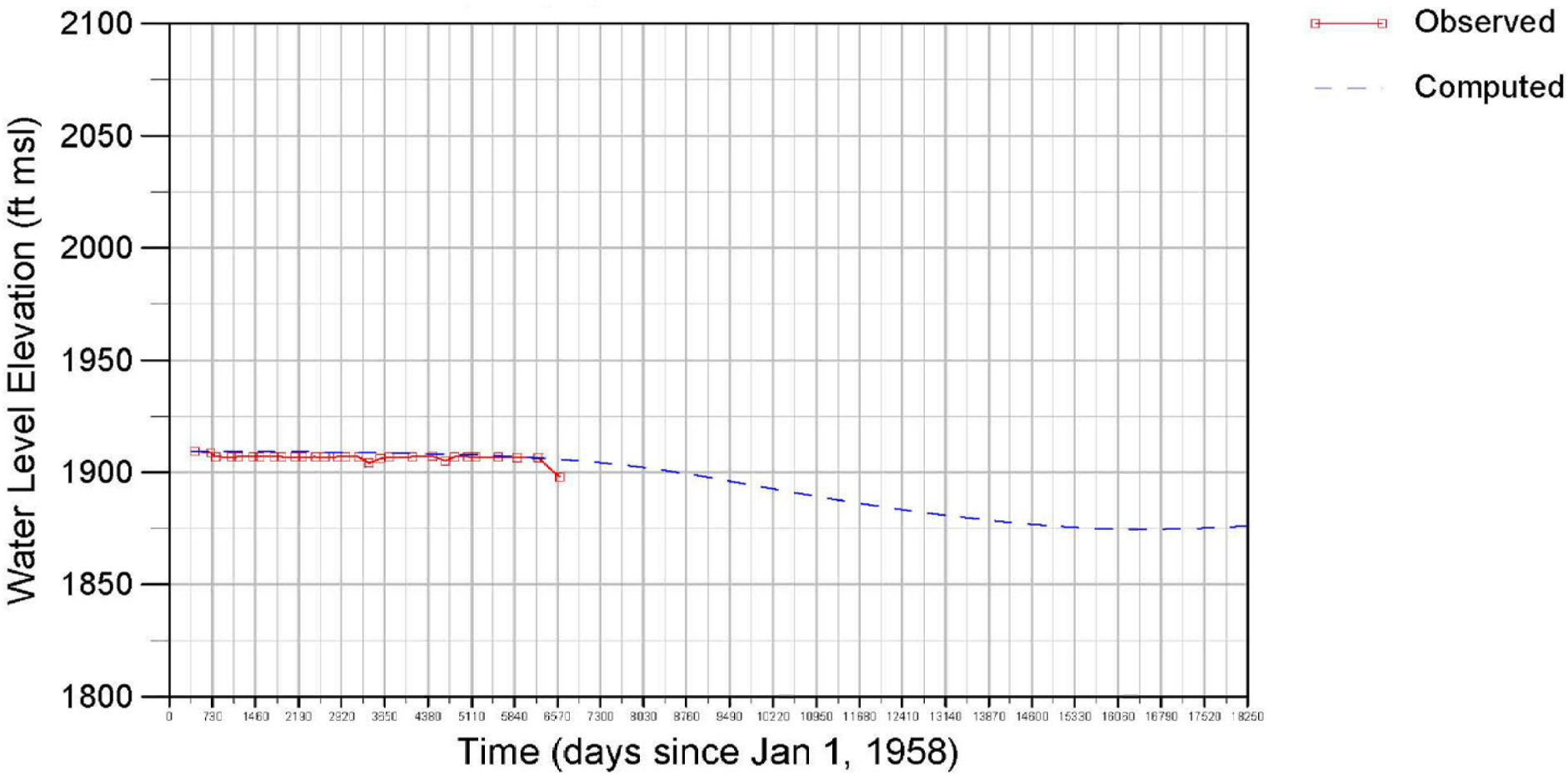
BSEP
Figure DR-121i
Model Verification
Hydrograph for 29S39E28H001M

Beacon Solar

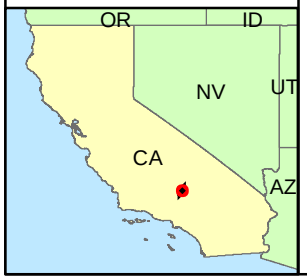
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-121i.mxd



Map Location



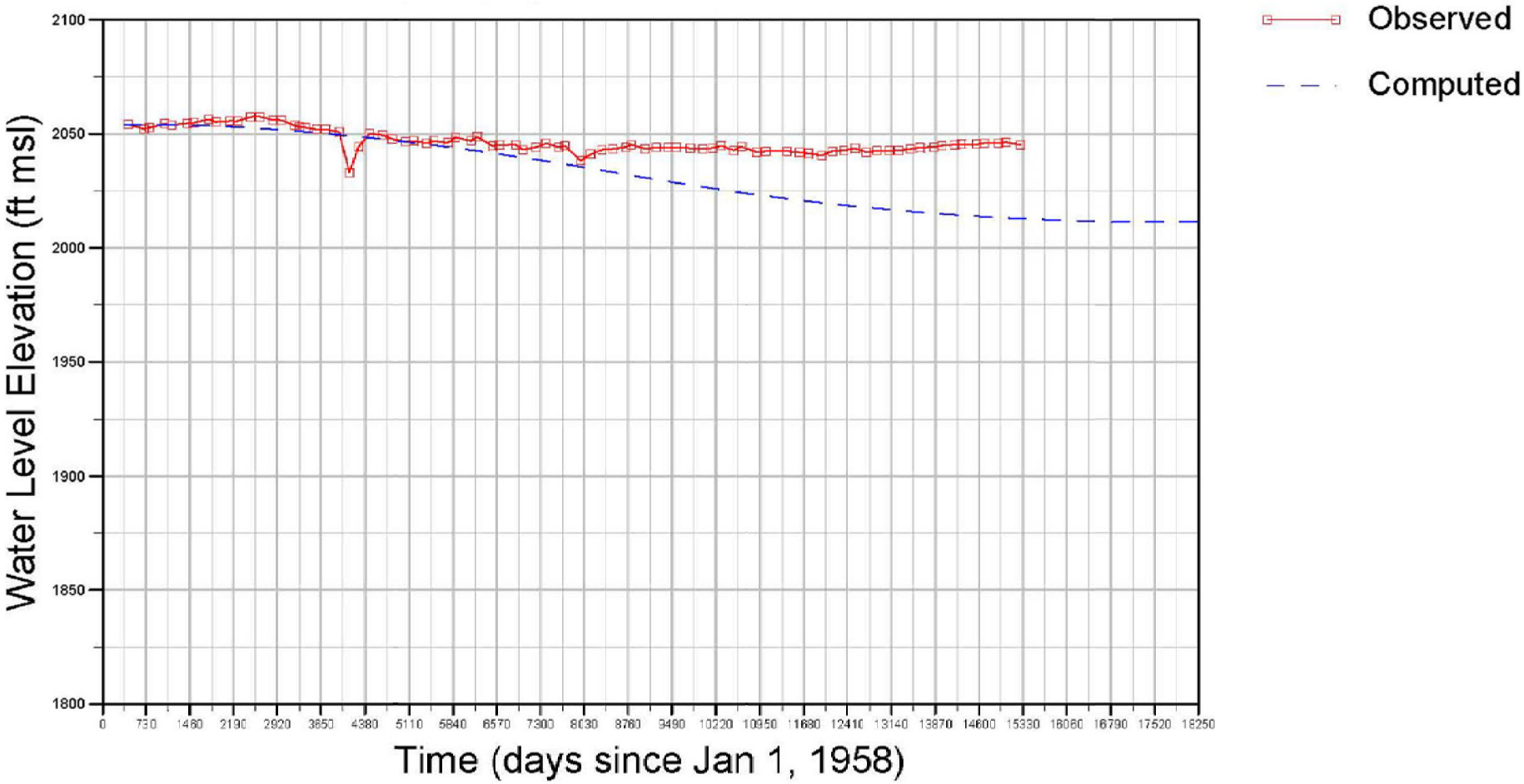
BSEP
Figure DR-121j
Model Verification
Hydrograph for 30S39E08A001M

Beacon Solar

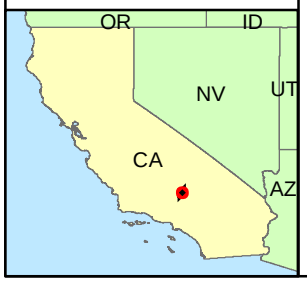
ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-121j.mxd



Map Location



BSEP
Figure DR-121k
Model Verification
Hydrograph for 31S37E35N001M

Beacon Solar

ENSR | AECOM

Project: 10056-014
Date: Oct. 2008

J:\GIS\Projects\10056-Beacon\mxd\Figure DR-121k.mxd