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California Energy Commission
Docket Unit
1516 Ninth Street
Sacramento, CA 95814-5512

Subject: **GENESIS SOLAR, LLC'S DATA RESPONSES TO CURE'S DATA REQUEST SET 2 (1-9)**
DOCKET NO. (09-AFC-8)

Enclosed for filing with the California Energy Commission is the original copy of **GENESIS SOLAR, LLC'S DATA RESPONSES TO CURE'S DATA REQUEST SET 2 (1-9),** for the Genesis Solar Energy Project (09-AFC-8).

Sincerely,

Marie Mills

Marie Mills

Supplemental Filing

Response to CURE

Water Resources Data Requests 1 - 9

In support of the

Application for Certification

for the

Genesis Solar Energy Project

(09-AFC-8)

Submitted to the:

California Energy Commission

Submitted by:

Genesis Solar, LLC

With Technical Assistance by:

WorleyParsons
resources & energy

Sacramento, California

April 2010

Well Data

Item 1
Please explain the differences in measured water levels between wells 9 and 15 during the same period of increased prison well pumping (1995 to present).

Response
As indicated in Table 3-3 of the *Groundwater Resources Investigation* prepared by WorleyParsons and dated January 8, 2010 (the GRI report, WorleyParsons, 2010a), the period of record for groundwater level measurements for well 9 is from 1990 to 1992 (three measurements) and the period of record for groundwater level measurements for well 15 is from 1992 to 2009 (three measurements, the last of which was made by WorleyParsons). As such, the periods of record of groundwater level measurements do not overlap and the record for well 9 does not include the requested period from 1995 to present. The difference in water level elevations between these two wells in 1992 is likely related to their different locations – well 9 is located easterly and downgradient of well 15 as shown on Figure 11 of the GRI report.

Item 2
Please confirm and demonstrate that wells 9 and 15 screen the same saturated zones from which the Applicant proposes to pump.

Response
Information regarding screened intervals or original completion depths of wells 9 and 15 is not available from the United States Geological Survey (USGS) or the California Department of Water Resources (DWR); therefore, it has not been confirmed which saturated zones the wells are completed in and this information was not provided in the GRI report. The depth of well 15 was measured to be 538 feet by WorleyParsons during field investigation in support of the GRI report in September 2009;however, it is not known if the well is partially collapsed and therefore it could be deeper. If this is the correct depth, this well is completed above the interval proposed for the Project's water supply, which is approximately 800 to 1,800 feet below ground surface. Well 9 could not be located during the field investigation, so its depth could not be determined.

Item 3
Please explain how the absence of wells and the historic water level data gaps in the immediate Project area may affect uncertainties in both the analytical (Theis non-equilibrium) drawdown evaluation and the "impacts only" numerical groundwater model.

Response
As is typical for many desert basins, the eastern portion of Chuckwalla Valley Groundwater Basin (CVGB) has undergone only limited groundwater supply development. Prior to installation of the test well and observation well at the site, no

wells had been installed on the north side of Ford Dry Lake. Nevertheless, data from 13 aquifer pumping or specific capacity tests were available for derivation of average aquifer parameters for construction of the analytical model presented in the Application for Certification (AFC) for the project submitted in August 2009 and the numerical model presented in the GRI report. These data were corroborated by a seven day pumping test conducted on Test Well No. 1 (WorleyParsons, 2010a), and later by two 72-hour pumping tests and one 24-hour pumping test conducted on Test Well No. 2 (WorleyParsons, 2010b), which yielded similar results. In addition, a geophysical investigation was conducted using Time-Domain Electromagnetics (TDEM) to investigate subsurface conditions between the site and the location of Test Well No. 1, and near existing water supply wells on the south side of for which lithologic and specific capacity test data were available. The TDEM survey indicated that subsurface conditions are generally similar throughout the area.

Based on these data, the average aquifer properties derived from evaluation of existing data and the investigations conducted by WorleyParsons are relatively consistent throughout the eastern CVGB, and form a reasonable basis for area wide modeling of groundwater level effects. Because the available data were deemed insufficient to use history matching as a means of calibration, it was decided that use of an impact modeling approach would be more appropriate and that the model would be calibrated to transient stress events such as pumping tests. Uncertainties in the modeling results were discussed and evaluated through sensitivity analysis and validation as presented in the GRI report.

Agricultural Pumping

Item 4

What is the projected future agricultural pumping demand in the Western Chuckwalla Groundwater Basin?

Response

Future agricultural groundwater demand in the western CVGB is discussed in Section 3.7.4.2 of the GRI report (WorleyParsons, 2010a). Information compiled by the DWR for updates to the California Water Plan indicates that increased agricultural groundwater demand is not expected in the western Chuckwalla Valley. The estimated agricultural groundwater demand was calculated for the western CVGB by GEI (2009) based on assessment of current agricultural cropping patterns in the western Chuckwalla Valley and application of appropriate water duties, and was reviewed by WorleyParsons. A major contributor to groundwater demand in the western CVGB is a palm orchard located east of Desert Center. This orchard is currently immature, but the water duty applied to this orchard in the demand estimate is for mature palm trees and is thus conservative and will apply to the orchard in future years. Agricultural water demand in the western CVGB is not expected to change from this estimate.

Item 5
Given the recognized hydraulic continuity between the Western Chuckwalla Groundwater Basin and Eastern Chuckwalla Groundwater Basin, please indicate how future increased agricultural pumping in the Western Chuckwalla Basin may impact available groundwater supplies for the proposed Project?

Response
Agricultural groundwater pumping is not expected to increase in the future. The impact of current and future agricultural pumping on the CVGB water budget are discussed in Section 5.9.2 and Table 5.2 of the GRI report (WorleyParsons, 2010a). The cumulative effect analysis discussed in Section 5.9 of the GRI report included consideration of future agricultural pumping together with other planned and reasonably foreseeable pumping. As shown on Figure 27 of the GRI report, limited drawdown ranging from approximately 3 to 6 feet in the pumped aquifer will result in the eastern CVGB as a result of cumulative pumping effects. This limited drawdown will not significantly effect available groundwater supplies for the Project.

<u>Outflow from the eastern Chuckwalla Valley Groundwater Basin to the Palo Verde Mesa Groundwater Basin</u>

Item 6
Please evaluate the potential for outflow of groundwater from the Eastern Chuckwalla Groundwater Basin to the Palo Verde Mesa Groundwater Basin, and any uncertainties in the existing data set that is currently available to evaluate the hydraulic connection between the two basins.

Response
As discussed in the GRI report, the CVGB and the Palo Verde Mesa Groundwater Basin (PVMGB) are considered to be hydraulically connected based on the continuity of water-bearing basin fill sediments between the two basins through the narrows between the McCoy Mountains on the north and the Mule Mountains on the south (Figure CDR-6-1). Metzger and others (1973), Wilson and Owen-Joyce (1994) and DWR (2004) all consider the basins to be hydraulically connected and groundwater underflow to occur from the CVGB to the PVMGB.

The extent of underflow through the narrows between the CVGB and the PVMGB is dependant on the hydraulic conductivity of the basin fill sediments, the cross sectional area through which flow occurs and the hydraulic gradient driving the flow; or, alternatively, the length of the saturated cross section through which flow occurs and the average transmissivity of the sediments along the cross section. Several previous efforts have been made to evaluate the underflow between the two basins as summarized below:

- Metzger and others (1973), utilized gravity and seismic data to model a north to south cross-section between the Mule Mountains and the McCoy Mountains. This cross-section estimated that the bedrock sloped between the two mountain ranges to an approximate depth of 1,500 feet below ground surface (bgs). The base of the cross section was arbitrarily selected to be a triangle. Assuming a depth to water of approximately 250 feet below ground surface (bgs), the width of the top of the saturated section was estimated to be approximately 4 miles. Based on these values, a cross-sectional area of approximately 13 million square feet was calculated. A hydraulic gradient of 0.00057 was taken from groundwater level data in the CVGB. The transmissivity of the basin fill sediments in the narrows was assumed to be moderate based on data from other locations for the Bouse Formation and Fanglomerate, and was estimated to be 4,010 square feet/day (ft^2/day), which corresponds with an average hydraulic conductivity of approximately 6 ft/day. The estimated underflow calculated using these inputs was 400 acre-feet per year (AFY).

- Woodward Clyde Consultants (1986) updated the underflow estimate prepared by Metzger and others using the same cross sectional area and hydraulic gradient together with an updated hydraulic conductivity of 14 ft/day derived from a pumping test conducted at the prison. The updated estimate was 866 AFY.
- A second update of the underflow estimate by Metzger and others (1973) was prepared by Engineering Science in 1990. Engineering Science (1990) used updated gradient information that considered the results of monitoring and return flow from prison effluent disposal to derive an underflow estimate of 1,162 AFY.
- Wilson and Owen-Joyce (1994), used existing gravity data gathered by USGS to identify a bedrock ridge underlying the basin fill approximately 10,000 feet east of the cross section produced by Metzger and others (1973). This ridge was thought to impose a greater restriction on aquifer thickness than what Metzger and others (1973) reported. The top of the ridge was modeled to be approximately 330 feet below mean sea level, the width of the saturated alluvial deposits were estimated to be 3 miles, and the width of the underlying fanglomerate was estimated at 1.9 miles wide. The narrows, bounded by the McCoy Mountains and the Mule Mountains, is considerably wider at this location and justification for these assumed widths was not provided; however, the purpose of the study by Wilson and Owen-Joyce was simply to investigate whether a hydraulic connection exists between the CVGB and the PVMGB and not to evaluate the magnitude of underflow.
- Existence of the bedrock ridge identified by Wilson and Owens-Joyce was cited by GEI Consultants (GEI, 2009) to support reversion to the more conservative original underflow estimate of 400 AFY.

Uncertainties in the above estimates include the width and topography of the bedrock section underlying the narrows, the stratigraphy and hydraulic conductivity of the basin fill sediments in the narrows and the hydraulic gradient driving the flow. To address these uncertainties, WorleyParsons undertook to refine the above described analyses and prepare an updated estimate of underflow from the CVGB to the PVMGB as described below.

Flow Cross Sectional Area

WorleyParsons re-examined the bedrock topography within the narrows and modeled the available gravity data to better understand the saturated cross sectional geometry of the narrows. Three cross-sections in the area connecting the Chuckwalla Valley and the Palo Verde Mesa were modeled. The modeling was refined using the approach and input parameters described in Appendix 1 of the GRI report (WorleyParsons 2010a). Primarily, the modeling was calibrated using actual bedrock depths encountered in the CVGB and a more appropriate density was used to model the metamorphic rocks underlying the basin. The locations of these cross sections are shown on Figure CDR-6-1.

The first cross-section (Line H) extends from the CVGB in the west to the PVMGB in the east (Figure CDR-6-2). The model produced generally similar results in the narrows to the model created by Wilson and Owen-Joyce (1994), and Metzger and others (1973). A shallow bedrock ridge was identified at approximately the same location as the ridge identified by Wilson and Owen-Joyce (1994). However, the maximum depths to bedrock estimated to the east and west of the narrows are substantially shallower in the WorleyParsons model.

Two cross-sections, Lines I and J, were modeled from south to north within the narrows. Modeled Line I extends from south to north in the approximate location of the bedrock ridge identified by Wilson and Owen-Joyce (Figure CDR-6-3). This cross-section identified a saturated area that is approximately 5.8 miles wide and has a cross-sectional area of approximately 24.6 million square feet. The geometry and width of the cross section indicates that while the bedrock is at its shallowest point at this location, the area is likely not the most hydraulically restrictive point of the narrows as Wilson and Owen-Joyce had supposed.

Modeled Line J is located near the section profiled by Metzger and others (1973), and extends from the Mule Mountains in the south to the McCoy Mountains in the north (Figure CDR-6-4). Metzger and others (1973) modeled a triangular profile extending to a bedrock depth of approximately 1,000 feet below mean sea level. Line J indicates a similar shape; however, it extends slightly deeper (approximately 1,300 feet below mean sea level). This model indicates a cross-sectional area of 24 million square feet, which is nearly twice that estimated by Metzger and others (1973). This location is assumed to be the most hydraulically restrictive location for underflow within the narrows.

Properties of Basin Fill Sediments

Three geologic units reportedly comprise the water bearing materials within the narrows (Wilson and Owen-Joyce, 1994). These units include the Quaternary Alluvium, the Pliocene Bouse Formation, and the Miocene Fanglomerate. A detailed description of these units was provided in Section 3.6 of the GRI report (WorleyParsons, 2010a). Based on a review of boring logs, specific capacity tests and aquifer tests for 14 wells in the eastern CVGB, the average hydraulic conductivity of these materials is approximately 12 to 14 ft/day in this region of the basin. This range of hydraulic conductivity values was confirmed by three aquifer tests conducted at multiple levels in the Bouse Formation and Fanglomerate during the supplemental test well program implemented by WorleyParsons (WorleyParsons, 2010b). Hydraulic conductivities of specific intervals may be higher or lower than these average values. For example, the calibrated hydraulic conductivity for sand strata in the Quaternary Alluvium derived during numerical modeling for the GRI report was up to 30 ft/day. Hydraulic conductivities for clay strata were several orders of magnitude lower.

Well 57 is located within the narrows (Figure CDR-6-1); however, a boring log was not available to evaluate the hydraulic properties of the water bearing sediments penetrated by this well. A boring log for Bashas's Well 3 (Metzger and others, 1973), located approximately 1 mile east of the narrows, suggests that the water bearing materials penetrated by this well may have similar hydraulic conductivities to those estimated for the CVGB. Sand and gravel strata encountered in the upper, alluvial section of this well are consistent with hydraulic conductivity values in the range of 30 ft/day or more. The lower section of this well includes interbedded sand and clay attributed to the Bouse Formation and interbedded sand, gravel and clay attributed to the Fanglomerate. The nature of these sediments appears generally similar to those encountered in the eastern CVGB, which are estimated to have an average hydraulic conductivity in the range of 12 to 14 ft/day. Based on available data, the water bearing strata between the two basins appear to be contiguous with similar hydraulic properties.

Hydraulic Gradient

Available groundwater level data from the USGS NWIS database were evaluated for 19 wells in the vicinity of the narrows (Figure CDR-6-1; Table CDR-6-1). Data from well pairs on either side of the narrows were used to calculate average hydraulic gradients. Well pairs consist of wells with similar screened intervals and groundwater level data from similar time periods, whenever possible. The most extensive water level data were available from the fall of 1990. An average lateral hydraulic gradient raging from 0.00046 to 0.00056 was estimated between wells 23 and 59, and wells 31 and 59, respectively (Table CDR-6-2). These wells generally represent conditions above a depth of 700 feet bgs. An average lateral hydraulic gradient raging from 0.00021 to 0.00025 was estimated between wells 33 and 62 and wells 36 and 62, respectively. These wells generally represent the lateral hydraulic conductivity below 700 feet bgs. These hydraulic conductivities are similar to the range discussed by Metzger and others (1973), which is 2 to 3 feet per mile, or 0.00038 to 0.00057; however, it appears that the gradient decreases with depth.

Refined Calculation of Underflow

Based on the gravity modeling results discussed above, a refined estimate of the cross sectional area in the most hydraulically restrictive portion of the narrows between the CVGB and the PVMGB is 24 million square feet, as illustrated by Figure CDR-6-4. The cross-sectional area of the saturated strata above 700 feet bgs is approximately 10.6 million square feet and the cross-sectional area of the saturated strata below 700 feet bgs is approximately 13.4 million square feet. The average hydraulic conductivity of the basin fill sediments in the narrows is estimated to be 14 ft/day, which is based on the aquifer tests and specific capacity tests from the CVGB discussed previously. Using the average hydraulic gradients for each depth interval, the underflow through saturated sediments above 700 feet bgs is 632 AFY, and the underflow through saturated sediments deeper than 700 feet is 356 AFY. The total estimated underflow is 988 AFY.

As discussed in greater detail below in the response to Item 7 and shown on Table CDR-6-2, using well-pair water level data at different times and neglecting the possible vertical variation in hydraulic gradient yields underflow estimates ranging from 569 AFY to 1,199 AFY. Of these estimates, 988 AFY is considered to be the most reliable because it is based on the most comprehensive data set and is consistent with two estimates based on subsequent water level data.

Item 7
Please provide a comprehensive evaluation of potential decreased outflow into the Palo Verde Mesa Groundwater Basin due to increased Project pumping in the Eastern Chuckwalla Basin, using comparative water level data (hydrographs) and groundwater production data from both basins over the same historic time period.

Response
An evaluation of the effect of the Project on outflow from the CVGB into the PVMGB was presented in Section 5.3 of the GRI report. This analysis was made using the numerical groundwater flow model constructed for analysis of Project impacts to groundwater resources, and indicates that underflow will be reduced by project pumping. The amount of reduction is predicted to be approximately 10 AFY after the three year construction period and to increase to 319 AFY at the end of the Project's 30-year operational life. This assessment did not include information regarding the more restrictive bedrock geometry identified in the evaluation discussed under Item 6, above, and therefore may represent a conservative (high) estimate of the actual project-induced decrease in underflow.

The data summarized in Table CDR-6-1 provide additional perspective on possible past influences of pumping on underflow between the CVGB and the PVMGB. Available groundwater level data from the USGS NWIS database were evaluated for 19 wells in the vicinity of the narrows (Table CDR-6-1). Groundwater levels from selected wells were graphed to illustrate historical fluctuations in groundwater levels on either side of the narrows (Figure CDR-7-1). These fluctuations control the lateral hydraulic gradient across the narrows and control the magnitude of the underflow. An increase in the lateral hydraulic gradient will result in an increase in the underflow and visa versa. Qualitative review of the hydrographs in Figure CDR-7-1 indicates that water level fluctuations observed in the CVGB have been about twice as great as those observed in the PVMGB. In general, periods of the least underflow would be expected to be associated with periods when pumping-related drawdown in the CVGB exceeded that in the PVMGB; however, comparison of water levels in similar well pairs suggest relatively consistent underflow from late 1966 through 2000. This finding is despite the fact that during this time there was a known period of increased agricultural water demand in the CVGB and the onset of pumping for the Chuckwalla and Ironwood State Prisons.

Based on the available data, lateral hydraulic gradients were calculated for 1965, 1966, 1990, and 1999/2000 (Table CDR-6-2). Estimated underflow was lowest in 1965 at 569 AFY, increased to 1,199 AFY in 1966, and remained relatively stable after that time with 988 AFY in 1990 and 1,010 AFY in 1999/2000. The average calculated historical underflow is approximately 900 AFY. As discussed above in the response to Item number 6, the best data set was from the fall of 1990 and the underflow value of 988 AFY is considered the most reliable of the four estimates. The calculated increase in underflow between 1965 and 1966 may be related to a pumping induced decline in water level in the PVMGB.

Item 8
Please provide a detailed assessment of the potential data gaps and uncertainty associated with the conclusions presented by Wilson and Owens-Joyce (1994), based on their geophysical model, with respect to its impact on estimates of potential outflow into the Palo Verde Mesa Basin.

Response
This item was addressed in the above response to Item 6.

Item 9
Please evaluate the potential for Project groundwater pumping, in combination with factors (a) through (d) above, which may result in a cumulative overdraft situation in the Eastern Chuckwalla Groundwater Basin during future Project pumping.

Response
A water budget forecast for the eastern CVGB is presented in Table 5.2 of the GRI report and indicates that the eastern CVGB will not experience overdraft due to cumulative pumping. If the water budget for the entire CVGB is considered, a net deficit in the water budget develops due to cumulative future pumping, contributed to primarily by pumping in the western portion of the CVGB. The cumulative deficit at the end of the project is less than 0.5 percent of the available groundwater storage in the CVGB. The existence of drawdown or small imbalances in the basin water budget for a limited period of time does not necessarily imply the existence of adverse affects, significant impacts or critical overdraft conditions. A basin is considered subject to critical conditions of overdraft when continuation of present water management practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts (including increased extraction costs,

costs of well deepening or replacement, land subsidence, water quality degradation, and environmental impacts) (DWR, 2003). As discussed in Section 5.9 of the GRI report, cumulative impacts associated with future groundwater use in the CVGB are not anticipated to result in such conditions.

References

California Department of Water Resources (DWR), 2003, California's Groundwater: California Dept. Water Resources Bulletin 118 – Update 2003.

California Department of Water Resources (DWR). 2004. Chuckwalla Valley Groundwater Basin Description. California's Groundwater Bulletin 118 - Supplemental Information.

Engineering Science (ES), 1990, Water and Wastewater Facilities Engineering Study, California State Prison – Chuckawalla Valley. September.

GEI Consultants (GEI), 2009, Eagle Mountain Pumped Storage Project – Revised Groundwater Supply Pumping Effects: October 23

Metzger, D.G. and others. 1973 Geohydrology of the Parker-Blythe-Cibola Area, Arizona and California. U.S. Geological Survey Professional Paper 486-G. 130 pages.

Wilson, R.P., and Owen-Joyce, S.J. 1994, Method to Identify Wells that Yield Water that Will be Replaced by Colorado River Water in Arizona, California, Nevada, and Utah. U.S. Geological Survey, Water Resources Investigation Report 94-4005. 36 pages.

Woodward Clyde Consultants (WCC), 1986, Phase II Groundwater Investigation Wiley Well Area. September 24.

WorleyParsons, 2010a, Groundwater Resources Investigation, Genesis Solar Energy Project, Riverside County, California. January 8.

WorleyParsons, 2010b, Supplemental Groundwater Resources Investigation for Genesis Solar Power Project, Riverside County, CA. March 10.

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Table CDR-6-1

Available Groundwater Levels in the Vicintiy of the Narrows between the CVGB and the PVMGB

Well ID	State Well Number	Date	Time	Ground Surface Elevation (feet amsl)	Well Depth (feet bgs)	Water level (feet bgs)	GW Elevation (feet amsl)
Township 6 South Range 20 East							
22	006S020E33L001S	2/4/2002	16:45	387.60	800	125.29	262.31
23	006S020E33C001S	9/26/1990		392.10	400	134.1	258.00
	006S020E33C001S	2/10/1992		393.10	400	134.8	258.30
Township 6 South Range 21 East							
55	006S021E36M001S	10/24/1927		393.00	186	133	260.00
59	006S021E36F001S	3/30/1979		391.70	319	147	244.70
	006S021E36F001S	9/21/1990		391.70	319	155.98	235.72
	006S021E36F001S	3/7/1997	8:55	391.70	319	146.77	244.93
	006S021E36F001S	9/16/1999	14:12	391.70	319	146.52	245.18
Township 6 South Range 22 East							
56	006S022E19R001S	9/17/1977		395.60	300	150	245.60
	006S022E19R001S	9/23/1990		395.60	300	149.79	245.81
	006S022E19R001S	3/7/1997	13:33	395.60	300	147.06	248.54
	006S022E19R001S	9/15/1999	10:53	395.60	300	146.68	248.92
	006S022E19R001S	4/4/2006	12:40	395.60	300	146.65	248.95
	006S022E19R001S	4/5/2006	12:05	395.60	300	146.75	248.85
Township 7 South Range 20 East							
31	007S019E04R001S	9/16/1990		423.89	242	144.25	279.64
	007S019E04R001S	3/29/2000		423.89	242	144.41	279.48
32	007S020E04R001S	6/12/1961		418.00	316	151.83	266.17
	007S020E04R001S	10/10/1961		418.00	316	151.09	266.91
	007S020E04R001S	11/8/1961		418.00	316	151.03	266.97
	007S020E04R001S	1/10/1962		418.00	316	151.04	266.96
	007S020E18H001S	3/8/1962		418.00	316	150.89	267.11
	007S020E18H001S	4/9/1962		418.00	316	150.73	267.27

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Table CDR-6-1

Available Groundwater Levels in the Vicintiy of the Narrows between the CVGB and the PVMGB

Well ID	State Well Number	Date	Time	Ground Surface Elevation (feet amsl)	Well Depth (feet bgs)	Water level (feet bgs)	GW Elevation (feet amsl)
32	007S020E18H001S	5/7/1962		418.00	316	150.83	267.17
	007S020E18H001S	10/31/1962		418.00	316	150.9	267.10
	007S020E18H001S	3/13/1963		418.00	316	150.84	267.16
	007S020E18H001S	10/31/1963		418.00	316	150.91	267.09
	007S020E18H001S	3/19/1964		418.00	316	150.77	267.23
	007S020E18H001S	11/25/1964		418.00	316	151.13	266.87
	007S020E18H001S	3/18/1965		418.00	316	151.21	266.79
	007S020E18H001S	11/18/1965		418.00	316	151.4	266.60
	007S020E18H001S	3/2/1966		418.00	316	150.66	267.34
	007S020E18H001S	10/27/1966		418.00	316	150.89	267.11
	007S020E04R001S	3/16/1967		418.00	316	150.92	267.08
	007S020E04R001S	10/25/1967		418.00	316	150.86	267.14
	007S020E04R001S	10/23/1969		418.00	316	150.89	267.11
	007S020E04R001S	4/30/1970		418.00	316	150.95	267.05
33	007S020E16M001S	1/1/1987		457.50	1,200	202.25	255.25
	007S020E16M001S	9/17/1990		457.50	1,200	205.62	251.88
	007S020E16M001S	2/10/1992		457.50	1,200	206.7	250.80
	007S020E16M001S	2/11/1992		457.50	1,200	206.27	251.23
36	007S020E17G001S	12/1/1987		443.50	1,200	203	240.50
	007S020E17G001S	9/17/1990		443.50	1,200	189.05	254.45
	007S020E17G001S	2/10/1992	9:30	443.50	1,200	187.7	255.80
	007S020E17G001S	2/10/1992	9:45	443.50	1,200	186.2	257.30
	007S020E17G001S	3/16/2000	13:57	443.50	1,200	199.24	244.26
37	007S020E17C001S	2/11/1992		433.09	1,050	174.47	258.62
39	007S020E18H001S	4/5/1961		442.94	1,139	168.37	274.57
	007S020E18H001S	4/30/1970		442.94	1,139	171.81	271.13

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Table CDR-6-1

Available Groundwater Levels in the Vicintiy of the Narrows between the CVGB and the PVMGB

Well ID	State Well Number	Date	Time	Ground Surface Elevation (feet amsl)	Well Depth (feet bgs)	Water level (feet bgs)	GW Elevation (feet amsl)
39	007S020E18H001S	7/31/1979		442.94	1,139	173.48	269.46
	007S020E18H001S	7/24/1980		442.94	1,139	169.06	273.88
	007S020E18H001S	1/23/1981		442.94	1,139	169.22	273.72
	007S020E18H001S	9/23/1981		442.94	1,139	169.23	273.71
	007S020E18H001S	3/3/1982		442.94	1,139	170.26	272.68
	007S020E18H001S	1/28/1983		442.94	1,139	170.54	272.4
	007S020E18H001S	7/31/1984		442.94	1,139	170.65	272.29
	007S020E18H001S	2/27/1985		442.94	1,139	171.1	271.84
	007S020E18H001S	6/12/1985		442.94	1,139	172.9	270.04
	007S020E18H001S	2/9/1992		442.94	1,139	183.46	259.48
43	007S020E28C001S	3/15/1982		505.60	830	248	257.60
	007S020E28C001S	2/13/1992		505.60	830	232.35	273.25
	007S020E28C001S	3/29/2000		505.60	830	234.5	271.10
	007S020E28C001S	10/5/2000		505.60	830	234.84	270.76
	007S020E28C001S	1/10/2001		505.60	830	234.89	270.71
	007S020E28C001S	2/23/2001		505.60	830	234.45	271.15
	007S020E28C001S	4/16/2001		505.60	830	234.82	270.78
	007S020E28C001S	4/16/2001		505.60	830	234.82	270.78
	007S020E28C001S	7/10/2001		505.60	830	235.4	270.20
	007S020E28C001S	11/7/2001		505.60	830	235.66	269.94
	007S020E28C001S	11/7/2001		505.60	830	235.69	269.91
	007S020E28C001S	4/3/2002		505.60	830	234.69	270.91
	007S020E28C001S	4/3/2002		505.60	830	234.69	270.91
	007S020E28C001S	10/2/2002		505.60	830	236.16	269.44
	007S020E28C001S	10/2/2002		505.60	830	236.04	269.56
	007S020E28C001S	6/3/2003		505.60	830	235.59	270.01

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Table CDR-6-1

Available Groundwater Levels in the Vicintiy of the Narrows between the CVGB and the PVMGB

Well ID	State Well Number	Date	Time	Ground Surface Elevation (feet amsl)	Well Depth (feet bgs)	Water level (feet bgs)	GW Elevation (feet amsl)
43	007S020E28C001S	6/3/2003		505.60	830	235.61	269.99
	007S020E28C001S	11/5/2003		505.60	830	236.46	269.14
	007S020E28C001S	11/5/2003		505.60	830	236.45	269.15
	007S020E28C001S	3/2/2004		505.60	830	235.63	269.97
	007S020E28C001S	3/2/2004		505.60	830	235.65	269.95
	007S020E28C001S	8/4/2004		505.60	830	236.18	269.42
	007S020E28C001S	12/8/2004		505.60	830	236.11	269.49
	007S020E28C001S	4/15/2005		505.60	830	235.61	269.99
	007S020E28C001S	8/31/2005		505.60	830	236.17	269.43
	007S020E28C001S	2/14/2006		505.60	830	236.12	269.48
	007S020E28C001S	5/5/2006		505.60	830	236.38	269.22
	007S020E28C001S	8/10/2006		505.60	830	236.66	268.94
	007S020E28C001S	12/8/2006		505.60	830	236.57	269.03
	007S020E28C001S	2/7/2007		505.60	830	236.16	269.44
	007S020E28C001S	5/17/2007		505.60	830	236.55	269.05
	007S020E28C001S	9/5/2007		505.60	830	236.91	268.69
	007S020E28C001S	12/13/2007		505.60	830	236.55	269.05
	007S020E28C001S	3/19/2008		505.60	830	235.65	269.95
	007S020E28C001S	6/25/2008		505.60	830	235.62	269.98
	007S020E28C001S	9/24/2008		505.60	830	235.73	269.87
	007S020E28C001S	1/14/2009		505.60	830	235.25	270.35
	007S020E28C001S	4/16/2009		505.60	830	235.28	270.32
Township 7 South Range 21 East							
57	007S021E05C002S	2/10/1992		504.40	NA	255.28	249.12
	007S021E05C002S	2/5/2002	10:22	504.40	NA	256.18	248.22
	007S021E05C002S	2/5/2002	12:15	504.40	NA	256.18	248.22

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Table CDR-6-1

Available Groundwater Levels in the Vicintiy of the Narrows between the CVGB and the PVMGB

Well ID	State Well Number	Date	Time	Ground Surface Elevation (feet amsl)	Well Depth (feet bgs)	Water level (feet bgs)	GW Elevation (feet amsl)
57	007S021E05C002S	3/19/2002	13:15	504.40	NA	256.59	247.81
	007S021E05C002S	3/29/2006	14:17	504.40	NA	256.28	248.12
	007S021E05C002S	3/30/2006	7:54	504.40	NA	256.34	248.06
58	007S021E01C001S	11/17/1992	10:40	389.00	NA	145.59	243.41
	007S021E01C001S	11/17/1992	10:45	389.00	NA	145.58	243.42
	007S021E01C001S	11/17/1992	10:48	389.00	NA	145.58	243.42
	007S021E01C001S	2/16/2000	9:05	389.00	NA	144.39	244.61
	007S021E01C001S	3/30/2006	8:28	389.00	NA	144.24	244.76
	007S021E01C001S	3/31/2006	8:24	389.00	NA	144.07	244.93
60	007S021E12D001S	9/3/1965		387.58	390	130	257.58
	007S021E12D001S	1/28/1966		387.58	390	139.15	248.43
	007S021E12D001S	10/20/1966		387.58	390	139.46	248.12
	007S021E12D001S	8/1/1972		387.58	390	141	246.58
61	007S021E14B001S	1944		384.80	NA	140	244.80
	007S021E14B001S	6/9/1961		384.80	NA	137.06	247.74
	007S021E14B001S	2/15/1962		384.80	NA	138	246.80
	007S021E14B001S	5/24/1962		384.80	NA	139.8	245.00
	007S021E14B001S	6/20/1962		384.80	NA	139.9	244.90
	007S021E14B001S	7/19/1962		384.80	NA	139.81	244.99
	007S021E14B001S	8/16/1962		384.80	NA	139.75	245.05
	007S021E14B001S	9/17/1962		384.80	NA	139.7	245.10
	007S021E14B001S	10/11/1962		384.80	NA	139.82	244.98
	007S021E14B001S	11/8/1962		384.80	NA	139.82	244.98
	007S021E14B001S	12/13/1962		384.80	NA	139.84	244.96
	007S021E14B001S	1/9/1963		384.80	NA	139.82	244.98
62	007S021E14H001S	3/1/1966		379.52	900	130	249.52

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Table CDR-6-1

Available Groundwater Levels in the Vicintiy of the Narrows between the CVGB and the PVMGB

Well ID	State Well Number	Date	Time	Ground Surface Elevation (feet amsl)	Well Depth (feet bgs)	Water level (feet bgs)	GW Elevation (feet amsl)
62	007S021E14H001S	10/20/1966		379.52	900	132.9	246.62
	007S021E14H001S	8/1/1972		379.52	900	134	245.52
	007S021E14H001S	9/22/1990		379.52	900	137.6	241.92
63	007S021E02J001S	9/24/1990		388.80	NA	149.25	239.55
	007S021E02J001S	3/29/2006	15:10	388.80	NA	144.71	244.09
	007S021E02J001S	3/30/2006	8:46	388.80	NA	144.78	244.02
64	007S021E36D001S	9/23/1990		370.10	NA	133.34	236.76
	007S021E36D001S	3/23/1992		370.10	NA	133.77	236.33

Notes:
1. NA = not available
2 amsl = above mean sea level
3. bgs = below ground surface.

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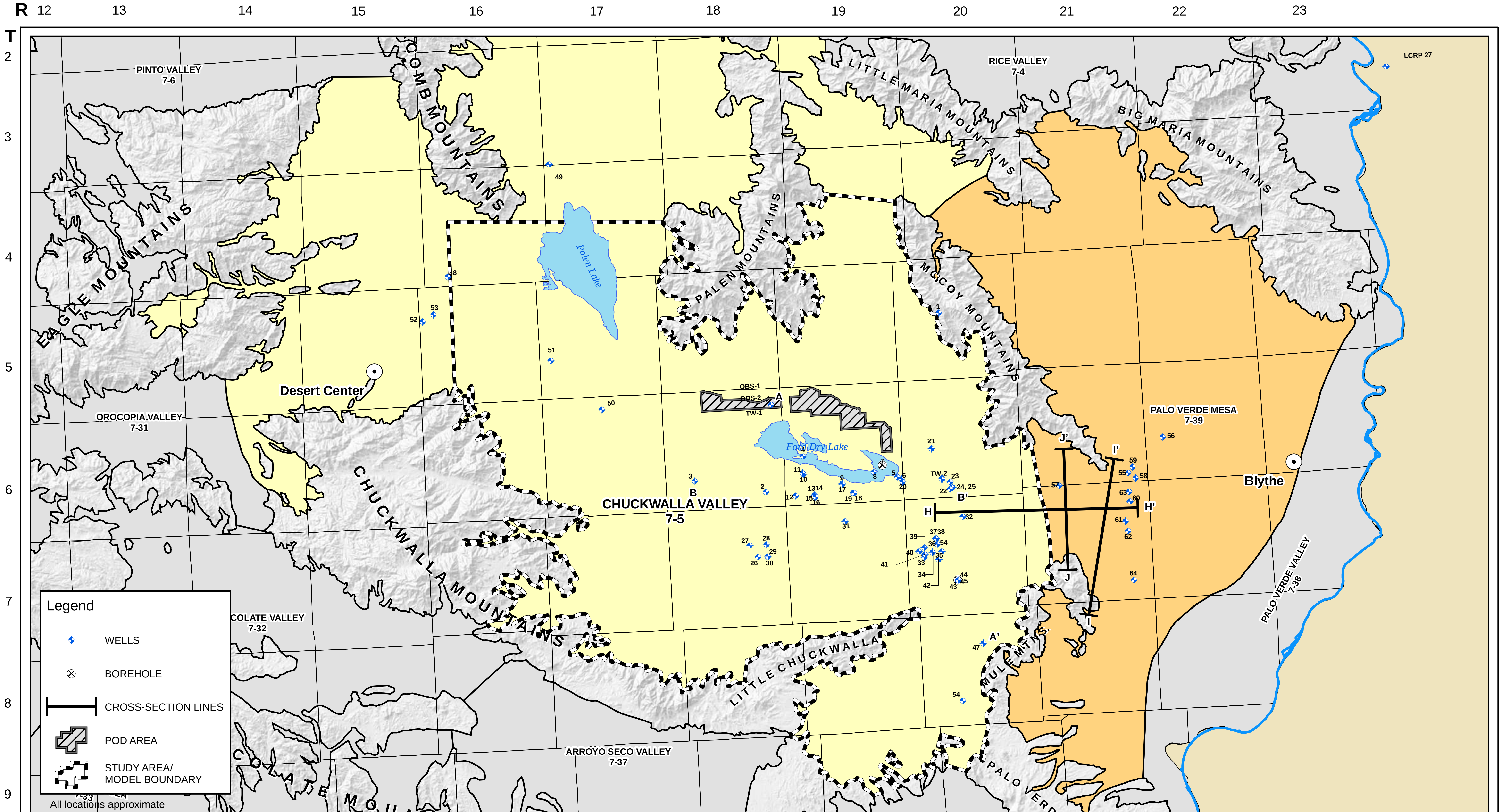
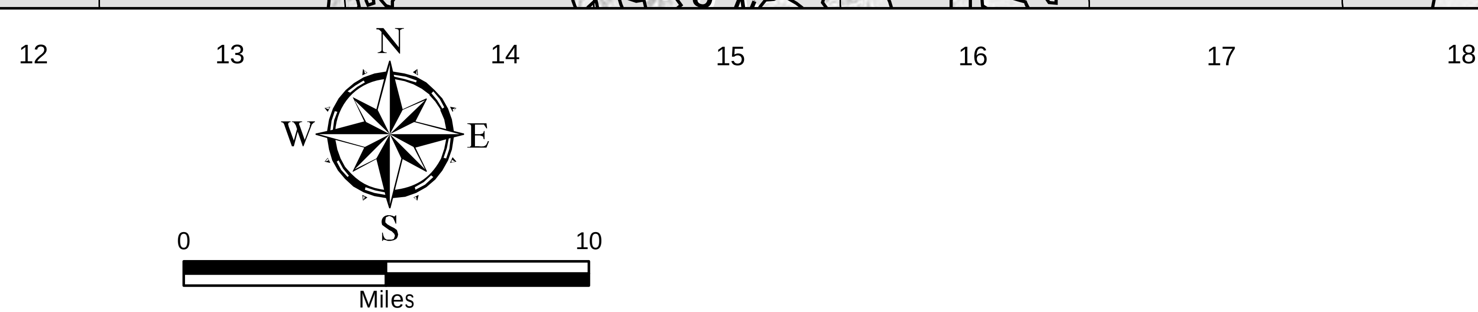
Table CDR-6-2

Underflow Between the Chuckwalla Valley and Palo Verde Mesa Groundwater Basins

Well ID	Groundwater Basin	Date	Well Depth (feet bgs)	Groundwater Elevation (feet amsl)	Distance Between Wells (feet)	Lateral Hydraulic Gradient	Cross-Sectional Area (square feet) [3]	Hydraulic Conductivity (ft/day)	Underflow (ft^3/day)	Underflow (AFY)	Average Underflow (AFY)	Total Underflow (AFY)
32	CVB	11/18/1965	316	266.6	44,600	0.00020	24,000,000	14	67,953	569	NA	569
60	PVMB	9/3/1965	390	257.58								
32	CVB	10/27/1966	316	267.11	44,600	0.00043	24,000,000	14	143,064	1,199	NA	1,199
60	PVMB	10/20/1966	390	248.12								
23	CVB	9/26/1990	400	258	48,900	0.00046	10,600,000	14	67,645	567	632	988
59	PVMB	9/22/1990	319	235.71								
31	CVB	9/16/1990	242	279.64	78,300	0.00056	10,600,000	14	83,259	698		
59	PVMB	9/22/1990	319	235.71								
36	CVB	9/17/1990	1,200	254.45	51,000	0.00025	13,400,000	14	46,091	386	356	
62	PVMB	9/22/1990	900	241.92								
33	CVB	9/17/1990	1,200	251.88	48,100	0.00021	13,400,000	14	38,846	326		
62	PVMB	9/22/1990	900	241.92								
31	CVB	3/29/2000	242	279.48	85,200	0.00036	24,000,000	14	120,518	1,010	NA	1,010
56	PVMB	9/15/1999	300	248.92								

Notes:
1. CVB = Chuckwalla Valley Basin
2. PVMB = Palo Verde Mesa Basin
3. Cross-sectional area calculated based on gravimetric modeling in the narrows.





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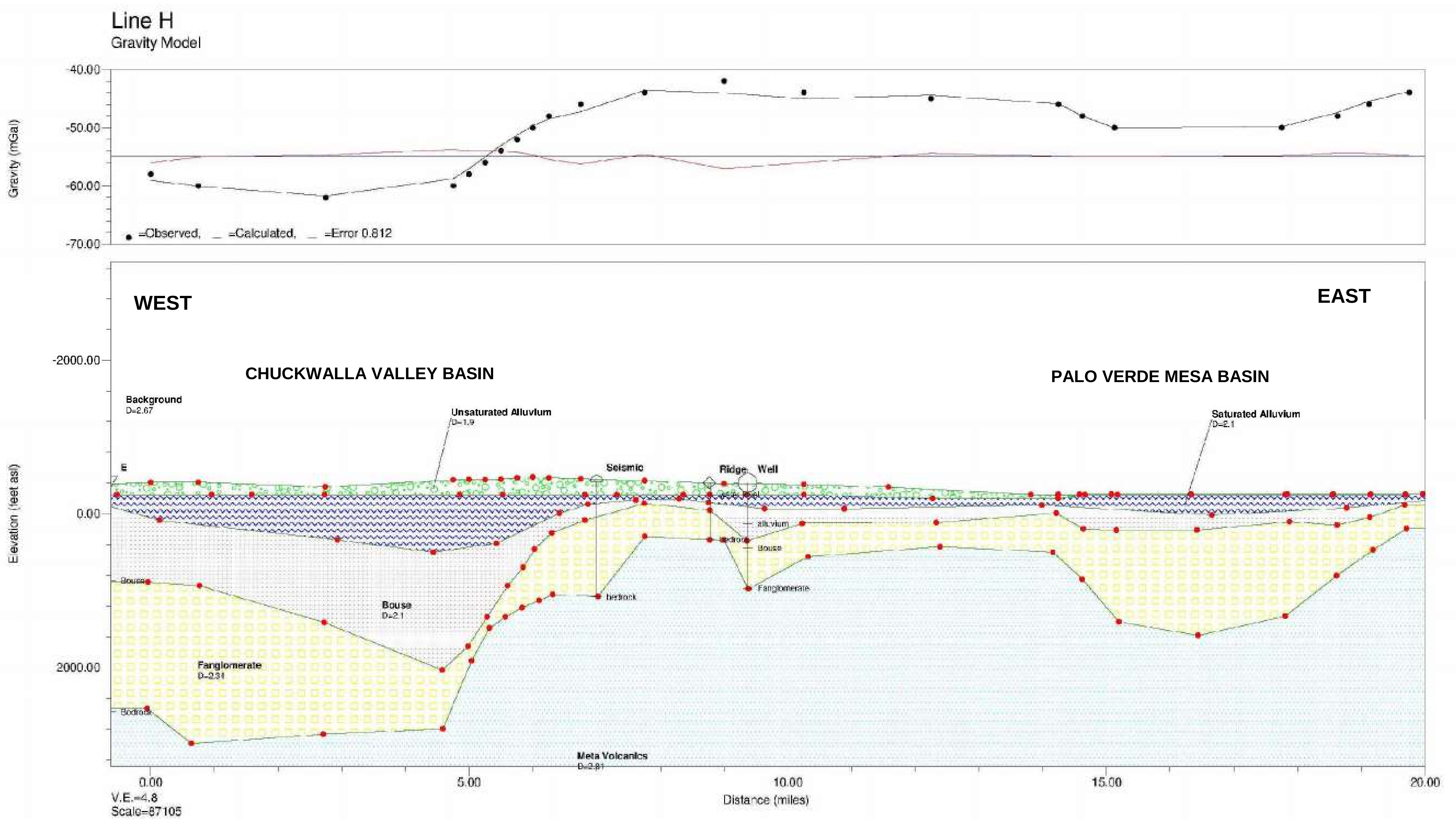
GRAVIMETRIC CROSS-SECTION LINES

SWL	NB	4/2010
52004617		9



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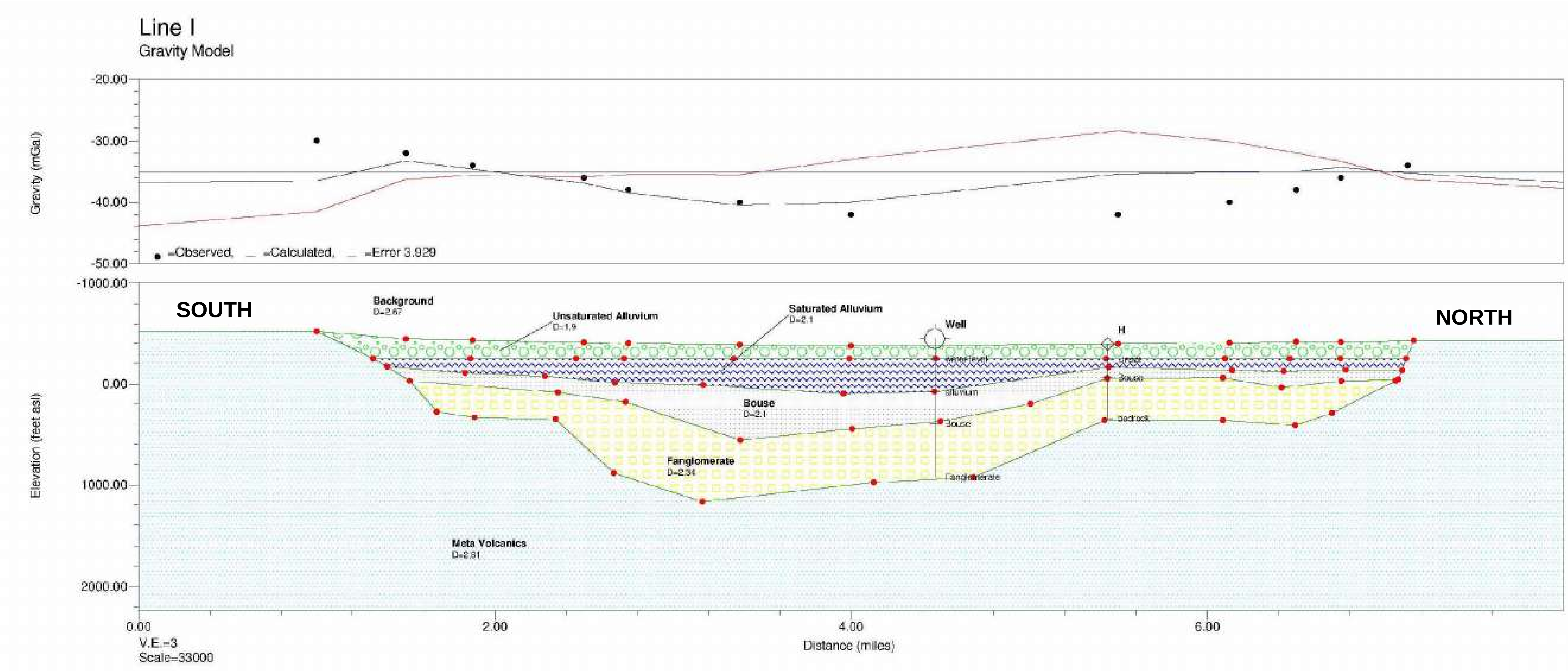
GRAVIMETRIC CROSS SECTION LINE H

Date: April 2010

Project: Genesis Solar, LLC

CDR-6-2



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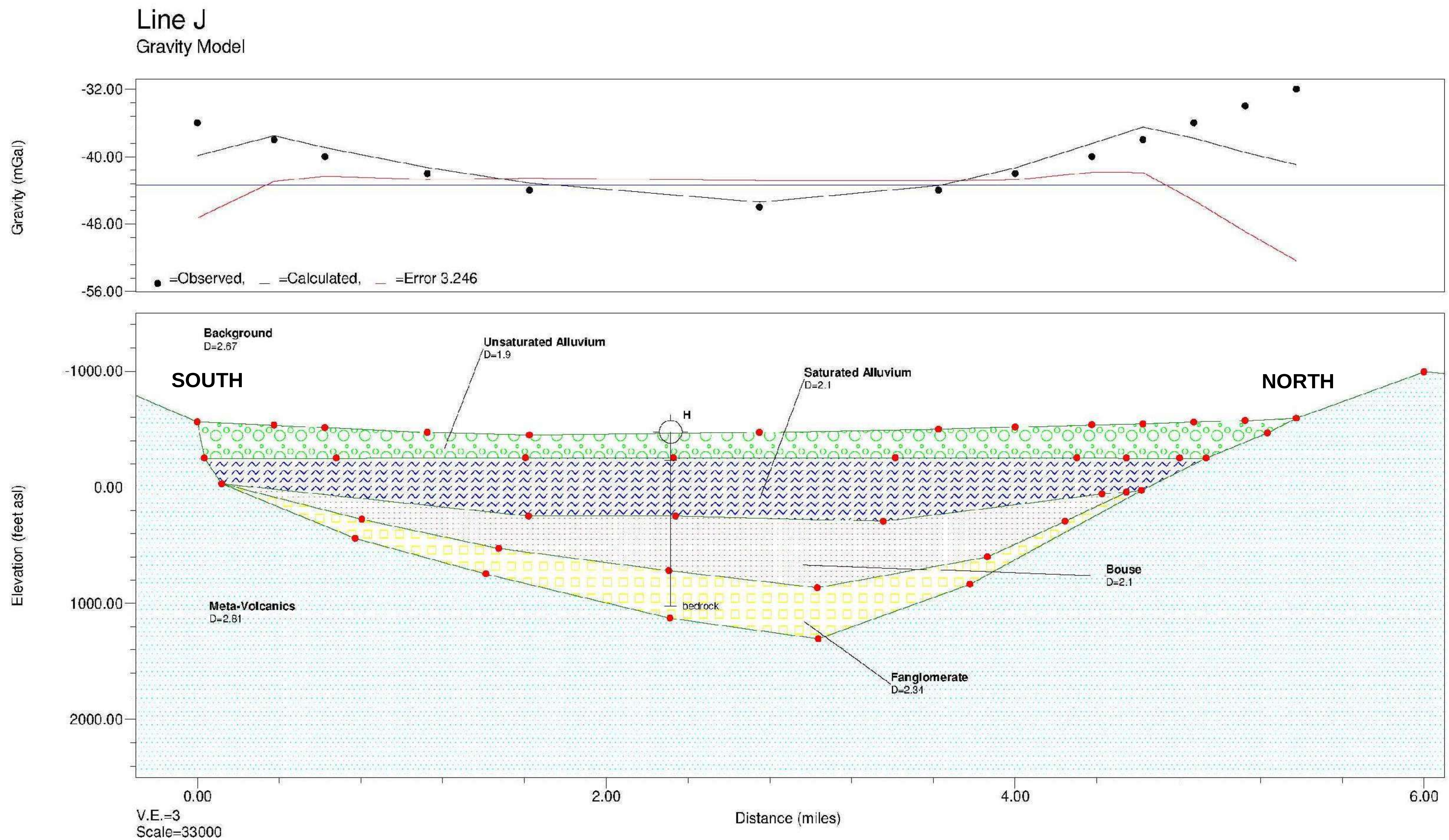
GRAVIMETRIC CROSS SECTION LINE I

Date: April 2010

Project: Genesis Solar, LLC

CDR-6-3



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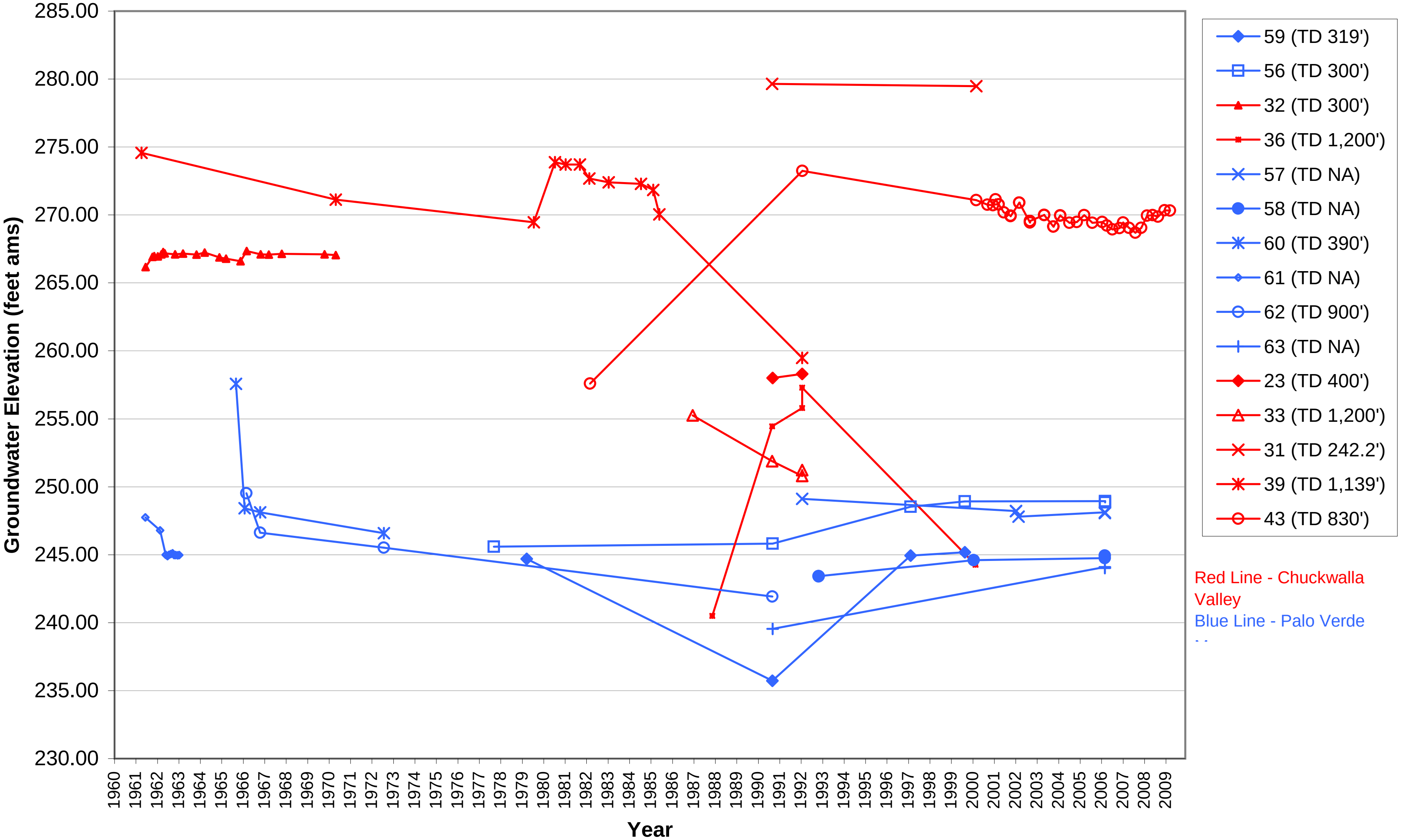
GRAVIMETRIC CROSS SECTION LINE J

Date: April 2010

Project: Genesis Solar, LLC

CDR-6-4

Figure CDR-7-1 - Hydrographs of Wells in the Vicinity of the Narrows Between the CVGB and the PVMGB



BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION FOR THE
GENESIS SOLAR ENERGY PROJECT

Docket No. 09-AFC-8

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(Revised 3/10/10)

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DECLARATION OF SERVICE

I, Marie Mills, declare that on April 28, 2010, I served and filed copies of the attached GENESIS SOLAR, LLC'S DATA RESPONSES TO CURE'S DATA REQUEST SET 2 (1-9), dated **April 28, 2010**. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at: **[http://ww.energy.ca.gov/sitingcases/genesis_solar].**

The documents have been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(*Check all that Apply*)

FOR SERVICE TO ALL OTHER PARTIES:

__X__ sent electronically to all email addresses on the Proof of Service list;

_____ by personal delivery;

__X__ by delivering on this date, for mailing with the United States Postal Service with first-class postage thereon fully prepaid, to the name and address of the person served, for mailing that same day in the ordinary course of business; that the envelope was sealed and placed for collection and mailing on that date to those addresses **NOT** marked "email preferred."

AND

FOR FILING WITH THE ENERGY COMMISSION:

__X__ sending an original paper copy and one electronic copy, mailed and emailed respectively, to the address below (***preferred method***);

OR

_____ depositing in the mail an original and 12 paper copies, as follows:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 09-AFC-8
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512

docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct, that I am employed in the county where this mailing occurred, and that I am over the age of 18 years and not a party to the proceeding.

// Original Signed //

____

Marie Mills