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CALIFORNIA ENERGY COMMISSION
REPORT OF CONVERSATION

Energy Facilities Siting and Environmental Protection Division

FILE: 02-AFC-1

PROJECT TITLE: Blythe II Energy Project (BEP2)

☒ **Telephone**	(760) 922-3144	☐ **Meeting Location:**	
NAME:	Roger Henning - Engineer	**DATE:** June 15, 2005	**TIME:** 1:15 PM
WITH:	Palo Verde Irrigation District (PVID)		
SUBJECT:	Discussion of Palo Verde Irrigation District's (PVID) Comments on the BEP II FSA		

COMMENTS:

BACKGROUND

Rich Sapudar and I called PVID to primarily discuss groundwater quality issues addressed in the Palo Verde Irrigation District's (PVID) comments on the BEP II FSA contained in their letter dated May 27, 2005. PVID addressed groundwater quality issues in comment number 5 and, also, comment number 6. Comment number 5 discussed saline degradation caused by groundwater pumping, and comment number 6 discussed selenium in groundwater. Prior to this conference call, we had informed Roger Henning that we wanted to better understand PVID's analysis and would like to obtain any data, studies or publications on which PVID's analysis was based.

DATA

As he had informed us by email prior to our conversation, Mr. Henning repeated that "there is very little documentation of water quality data under mesa." He reiterated that 'Metzger's Geological Survey Professional Paper 486 G printed in 1973 titled "Geohydrology of the Parker-Blythe-Cibola Area, Arizona and California" is the best source' that explains the groundwater dynamics of the region. He also referred us to the USGS well information on the internet. (These are the two primary data sources staff used to develop our FSA testimony.)

There were also two sources of information that were new to staff that Mr. Henning had used for the PVID analysis. The first is a report developed for the USBR entitled "Reduction of Salt Loading to the Colorado River from PVID" August 1976, by Bookman-Edmonston Engineering Inc. This study includes information on the magnitude of pumping drawdown that occurred in the mesa prior to 1976. The second is a graph showing the change in salinity in the Anderson agricultural drain located in the southwest portion of the Palo Verde Valley. Mr. Henning agreed send staff a copy of the report and the graph.

We also inquired whether PVID has water quality data showing changes in salinity in the wells for the Mesa Verde community and the city of Blythe that Mr. Henning cited in the PVID comments on the FSA (5/17/2005). Mr. Henning had not reviewed any water quality data for either the community or city wells, but confirmed that the Mesa Verde well was located on the mesa and all of the city wells were located in the valley. Mr. Henning suggested that the county service agency that manages the Mesa Verde well and the city of Blythe, which manages the city wells, might have annual water quality reports available.

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DISCUSSION

Mr. Henning also explained in more detail his understanding of how agricultural irrigation and the agricultural drains and canals have affected the water quality in the valley and the mesa.

In the valley, Mr. Henning reported that, prior to reclamation, the land was swampy and groundwater was saline with depth to water decreasing and salinity increasing to the southwest. Reclamation in the Palo Verde Valley has entailed draining and desalinizing the root zone of land so that it will be useable for agricultural irrigation. Mr. Henning explained that field drains first function to dewater swampy areas with poor quality water. Drains remove water from the agricultural root zone, typically to a depth of 5 to 10 feet from land surface. When agricultural irrigation begins, irrigation water further flushes pre-existing water from the upper 5 to 10 feet of soil. Since water diverted directly from the Colorado River is fresher than the pre-existing water, the quality of water discharging to the drain and the quality of water in the upper portion of the aquifer increases with time. Mr. Henning also stated that water quality below the upper 5 to 10 feet probably has remained saline because fresh water is less dense than saline water.

Using the example of Anderson drain, which is located at the southwestern end of Palo Verde Valley, the initial electrical conductance (EC) levels were 20,000 micromhos. In the first year of operation, the salinity in the Anderson drain water rose to an EC level of 26,700 micromhos. However, after 8 years of operation, EC levels in Anderson drain dropped to 4,000 micromhos. Mr. Henning reported that water quality in the Anderson drain reflected only groundwater conditions because the drain was only five feet deep, was constructed for reclamation only, and received only groundwater discharge from the high water table. (In contrast, permanent drainage canals, such as Rannells drain, received tailwater, stormwater, and operational spills, as well as groundwater discharge caused by unconsumed irrigation water percolating from agricultural fields.)

In the mesa, Mr. Henning stated that groundwater pumping had drawn of fresh Colorado River irrigation water from the canals and aquifers in the valley into the mesa aquifer, replacing poorer quality water that was being pumped out. He referred us to the 1976 Bookman Edmonston report, which documented the magnitude of pumping and drawdown that has occurred in the mesa. Based the changes in groundwater salinity in the valley and the amount of induced groundwater recharge from the valley to the mesa, PVID has concluded that groundwater quality in the mesa should also increase with pumping. Mr. Henning also noted that PVID has also delivered Colorado River water for irrigation to citrus orchards adjacent to BEP I causing direct fresh water recharge to the mesa aquifer, which he assumes would also decrease the salinity of groundwater near the BEP I and BEP II sites.

Finally, regarding PVID's comment number 6 (5/27/2005), Mr. Henning explained that PVID has concluded that the selenium levels measured in the BEP I evaporation ponds is another indicator that underflow of Colorado River water from PVID's drains in the valley had reached the BEP I site. Mr. Henning contends that selenium was absent in the mesa groundwater prior to irrigation because it was not reported in the USGS 1973 report (Metzger, 1973) and that selenium has been detected in present-day Colorado River water. Therefore, selenium must have been transported in the groundwater underflow from the valley to the BEP I site in the mesa.

cc: Rich Sapudar	Signed:
	Name: Linda Bond – LDBond & Associates