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CALIFORNIA ENERGY COMMISSION

Siting, Transmission, and Environmental Protection Division	**File: 11-AFC-04**	
	Project Title: Rio Mesa Solar Electric Generating Facility	
Conversation Method: Telephone, Workshop, and E-Mail	**Meeting Location: N/A**	
Name(s): Abdel-Karim Abulaban and Christopher Dennis	**Date: Varies**	**Time: Varies**
With: Ed Baquerizo (WorleyParsons), Todd Stewart (BrightSource Energy), Mike Tietze (Jacobson James & Associates), and Mark Trudell (WorleyParsons)		
Subject: Discussions with Applicant Regarding Groundwater Model Instability		

The applicant has refined a groundwater model originally developed by AECOM for the Blythe Solar Power Project (BSPP). The BSPP model itself is a refinement of a 2008 U.S. Geological Survey groundwater model developed for the Parker - Palo Verde – Cibola aquifer areas. Energy Commission staff have found that the applicant's groundwater model developed for the proposed Rio Mesa SEGF is not reliable and cannot be used for environmental impact analysis.

On four separate occasions, 24 May 2012, 20 June 2012, 16 August 2012, and 20 August 2012, during a workshop and meetings with the applicant, we tried to correct a fundamental error in the groundwater model developed by the applicant.

Inconsistencies between the applicant's Groundwater Impact Assessment Report (GIAR) and the applicant's refined version of the BSPP groundwater model were identified by Energy Commission staff. These inconsistencies are:

- The GIAR states that the model is a superposition model. The model is constructed as a head-elevation model.
- The GIAR states that the storage coefficient is 0.2. The model is constructed with a storage coefficient of 0.004.

Energy Commission staff raised other questions related to the groundwater model:

- The specific yield in the model is zero, why? Could this have been a translation error from the Groundwater Vistas model platform to the GMS model platform?
- The report states that injection wells are used for the Parker Valley flux. Why are injection wells not present in the model at this location?
- The model uses injection wells at the Mule and Palo Verde Mountains to simulate mountain front recharge. There are several other locations where these injection wells can be placed. Placement of injection wells at this location will cause the model to reduce project pumping drawdown effects. Why was this location chosen for the injection wells?
- Calibration Standard Deviation:
    a. What is the range? Is it the min/max of the residual relative head values or the min/max of the residual heads values relative to a datum such as mean sea level?
    b. The GIAR states that a residual Std Dev target of 10 percent was used for the calibration

statistics. This seems high to us and that a 5 percent Std Dev is appropriate. The difference in residuals heads is almost 10 feet for some coordinate locations. This seems great when the overall gradient in the model area varies by only about 50 feet. Why is a Std Dev target of 10 percent used?

- Groundwater Contouring:

  a. In the northwest area of the modeled zone, the observed groundwater gradient is 90 degrees different than the gradient produced by the model. Why was the gradient forced in the model?

  b. GSA report states that the McCoy Mountains are sedimentary rock overlaying Jurassic volcanic rocks (rhyodacite porphyry). Where the groundwater intercepts the Mtns, the rock appears to be sandstone/conglomerate/mudstone. Given the high permeability of this rock, could the groundwater gradient be towards the McCoy Mountains?

  c. Try removing the one data point in the far northwest corner of the modeled area and redraw the contours. Do the contours map out differently?

Most of the inconsistencies and questions were resolved during the workshop and meetings. However, to date, we have been unable to resolve this error:

- The final model run bedrock elevations are higher than groundwater elevations in portions of the model. This occurs even though recharge from the mountain front should cause model cells between the mountains and the deeper aquifer to be wetted at steady state. Recharge originating in the mountains must pass through these mountain front cells to recharge the aquifer.

Without a reliable model from which potential impacts to surface water and groundwater resources can be evaluated, staff cannot use the applicant's model to complete their analysis of potential impacts to other well owners in the groundwater basin, sensitive vegetation in the wash woodlands and the wetlands, groundwater basin levels, or the volume of flow in the Colorado River.

cc:	Date: **08/21/12**	Signed:
		Name: