PMComanchePeakPEm Resource

From: Monarque, Stephen
Sent: Wednesday, July 18, 2012 5:10 PM
To: Woodlan, Don; John.Conly@luminant.com; Evans, Todd
Cc: Roy, Tarun; ComanchePeakCOL Resource
Subject: Comments on Comanche Peak Groundwater Model - Draft

Here are some comments on the presentation by Beth Rowan of Enercon on the groundwater model under development for Comanche Peak. The conference call was on June 28, 2012 . Since this was just a modeling update, all the detailed information needed to provide an in-depth understanding of the modeling approach, model and grid setup, antecedent conditions assumed and input parameters was not provided. Therefore, the following preliminary comments on the materials presented during the teleconference should only be considered provisional.

Conceptual Model Assumptions and Model Setup

1) There seems to be an implicit assumption that the Glen Rose bedrock beneath the site is unsaturated. NRC staff has submitted multiple RAIs regarding water levels measured at the site. Existence of deeper Glen Rose groundwater is dismissed by the Applicant as not permanent despite long-term increasing trends in many of the deep C-zone wells. Slowly increasing water levels in wells in the deeper Glen Rose are consistent with inflow of groundwater from a saturated, low-permeability formation. Seasonal trends in groundwater elevation related to rainfall recharge are obvious, with as much as 10 ft of variation between wet and dry seasons in the A-zone and 5 ft in the B-zone (which will not be entirely excavated during construction).
2) It is not clear what antecedent moisture and groundwater flow conditions were assumed for the model runs. Was the model run with average recharge rates until steady state conditions were reached and then a rainfall event introduced? It almost seems as though it was assumed that everything is dry and then recharged from a storm event was input, which would create the numerical convergence problems and the dry cells that were observed. This approach (if used) would not produce conservative estimates of groundwater levels because it would not account for antecedent moisture in the subsurface formations at the site prior to a storm event occurring.
3) It is not clear how many layers were used to set up the model but based on the initial simulation results it does not appear that the model has enough layers to account for movement of water in and between the engineered fill, existing fill and bedrock. The model grid may also need to be set up with a smaller spacing to help resolve the numerical issues observed.
4) On slide #4 the conceptual model of surface water and groundwater flowpaths should show the potential for groundwater to flow into and out of the eastern and western retention ponds. It is also not clear why the turbine building CWS piping engineered fill is only shown having a potential connection with the eastern exiting fill and not the western existing fill. Is the hypothetical vertical pathway to the Twin Mountains Formation only associated with the R/B & A/B engineered fill?

Other Comments

1) USDA TR-55 report is referenced on slide #5. It is not clear how this methodology would be used in making conservative predictions of groundwater infiltration. As stated in the TR-55 document: Technical Release 55 (TR-55) presents simplified procedures to calculate storm runoff volume, peak rate of discharge, hydrographs, and storage volumes required for floodwater reservoirs. These procedures are applicable in small watersheds, especially urbanizing watersheds, in the United States. It is unclear what distributed recharge rate was assumed for the various materials that will exist at the site (existing fill, engineered fill, bedrock, etc).
2) Three groundwater discharge points from the engineered fill are shown on Slide #7. However, the engineered fill is in contact with the existing fill at other locations just at a higher elevation then the

base of the engineered fill. Therefore, groundwater could also exit through the existing fill at other locations if groundwater levels rise to high enough levels.

3) There are “well” boundary condition cells shown around the reactor units. It is unclear what these “wells” are being used for.
4) In addition to dry cells there appear to be flooded cells (water levels above land surface), especially in the engineered fill located south of Unit 3.
5) It is not clear how the algebraic calculations would be used to calculate groundwater levels in the engineered fill. In particular how would flow out of the engineered fill through the existing fill be determined and what antecedent moisture conditions and groundwater levels would be assumed? Assuming equal amounts of recharge throughout the engineered fill might not be conservative. There could be temporal and special variability in the recharge that would create higher water levels in some areas compared to others. For example, discharge areas to the existing fill could be expected to have lower groundwater levels then other areas further from the discharge point.
6) The groundwater model in the current form is a one layer model and the use of multilayer models might help in alleviating some of the numerical problems presented during the conference call.
7) Consideration of groundwater outflow from the fill was not adequately described, this is important in the analysis described by the applicant as the volumetric approach and the confirmatory MODFLOW model.

If you have questions with regard to our comments please let us know.

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