

**SUBJECT**

**Response to Fort Mojave Indian Tribe Comments on the Final Design Directives on Topock Groundwater Remediation Project**

**DATE**

December 4, 2015

**FROM**

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**DEPARTMENT**

PG&E Topock Modelling Team

**TO**

Yvonne Meeks, PG&E

**PROJECT NUMBER**

RC000753.0031

**NAME**

PG&E Topock Compressor Station  
Needles, California

**COPIES TO**

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This technical memorandum is in response to the November 20, 2015 letter issued by the Fort Mojave Indian Tribe (“the Tribe”) regarding the October 19, 2015 “Final Design Directives on Topock Groundwater Remediation Project” letter issued by the California Department of Toxic Substances Control (DTSC) and the United States Department of the Interior (DOI). Within the Tribe letter, five requests were made with respect to the model updates to be performed by the Pacific Gas and Electric Company (PG&E) and its contractors. The requests and PG&E responses are listed below:

- 1) Formal participation of the Tribe during the modeling process. This would involve a limited number of representatives (1 or 2) interacting with PG&E’s team at key junctures in the model development process. The purpose of this involvement would be to inform the Tribe of planned changes and analyses prior to and during the process, thereby allowing the opportunity for feedback on revisions before the updates are implemented.

**Response:** *Due to the relatively short deadline of the requested model updates (February 2016), there is limited time to solicit additional feedback/input from stakeholders as the model is being updated. PG&E understands that stakeholder feedback/input has been considered as part of the current directive and a summary of the model updates and updated outputs will be available for review upon submittal to the agencies. In addition, several future model updates are anticipated (per the model update procedure outlined in the 100% BOD report) which will allow for feedback to be incorporated into the model as necessary at that time.*

- 2) Proposed model updates and revisions will likely change currently projected groundwater flow conditions including water levels, gradients, water budgets, etc., possibly in a significant way. Such results might not only be expected in Arizona, but also beneath the Colorado River and even in California. Of critical importance to all stakeholders is, not only how the model will then perform under current “calibration” conditions, but how it will perform during the future design and operation. The Tribe therefore recommends that the recalibrated model be used to evaluate future design and operations. Further, the model should be used to reassess the need for, and if so determined, the number and locations of any monitoring wells proposed in Arizona.

**Response:** *The model will be evaluated under both the current “calibration” conditions as well as the currently proposed remedial design operation. The recalibrated model will also be used to assess the potential locations of monitoring wells proposed in Arizona.*

- 3) The Tribe requests that the modelers report additional output, such as water budgets that describe distributed magnitudes of flow between aquifer layers and the Colorado River, and flow magnitudes by layer in the paleochannel versus beneath the River. This should be reported under both calibrated and remediation conditions. It is expected that this will improve the understanding of how the remedy will impact the groundwater flow water balance. This type of data output could be provided in a timely manner in the form of a technical memo or data output package, as appropriate for the task.

**Response:** *A layerwise and full model simulated water budget will be produced for both calibration and remediation conditions.*

- 4) Model Update #8 is not clearly stated. It should be clarified and incorporate the following:
- a. The goal of the exercise should be more clearly stated. While it is important to perform such an analysis, the decisions it is intended to report should be explicitly identified.

**Response:** *As per ASTM guidelines for sensitivity analyses (ASTM D5611 – 94(2008)), the purpose of the sensitivity analysis is to examine “the sensitivity of calibration residuals and model conclusions to model inputs is a method for assessing the adequacy of the model with respect to its intended function.”*

- b. Will the sensitivity analysis be conducted over the entire model area, or just within Arizona and beneath the River?

**Response:** *Sensitivity analysis adjustments will be made on a more regional basis, then a localized area. While we have the greatest amount of data in the area of the site west of the Colorado River, parameter adjustments will be made across the appropriate extents of similar hydraulic features (ie. Riverbed conductance will be varied across the entire riverbed footprint in the model rather than a discrete location near the site).*

- c. A predictive sensitivity analysis, similar to that described in current American Society for Testing and Materials (“ASTM”) guidelines, should be performed so that tribes and stakeholders can fully understand what the probable and realistic range of future impacts might be during long-term operation of the proposed remedial system. Determine the extent and magnitude of potential plume and byproduct migration into Arizona. Key parameters to which calibration and the future remedial system operation are most sensitive should be systematically varied over a realistic range observed in the field.

**Response:** *ASTM guidelines for sensitivity analyses (ASTM D5611 – 94(2008)) will be utilized to guide the sensitivity analysis of the calibrated groundwater flow model. The results of the recalibrated groundwater flow model sensitivity analysis will determine the need for a predictive sensitivity analysis. A sensitivity analysis of the predictive scenario cannot be completed within the proposed model update deadline (February 2016).*

- 5) The Tribe requests that a predictive sensitivity analysis, similar to the sensitivity analysis indicated in updates #7 and #8, be conducted for fate and transport of Cr(VI), Mn, and As, which will be directly affected by changes in flow conditions resulting from the recalibration of model parameters.

**Response:** *The need for the sensitivity analysis for the solute transport modeling can only be assessed after completion of the model recalibration. The results of the recalibrated groundwater flow model will determine the need for rerunning the detailed sensitivity analysis of the solute transport model. Given the relatively short deadline of the requested model updates (February 2016) an additional detailed sensitivity analysis of the solute transport model cannot be completed within this timeframe.*