



# HARGIS + ASSOCIATES, INC.

HYDROGEOLOGY • ENGINEERING

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November 20, 2015

VIA ELECTRONIC MAIL

Mr. Aaron Yue  
Project Manager  
Department of Toxic Substances Control  
5796 Corporate Avenue  
Cypress, CA 90630

Ms. Pamela Innis  
CHF Remedial Project Manager  
U.S. Department of the Interior  
Denver Federal Center Bldg. 67 MS D108  
Denver, CO 80225

Re: October 19, 2015, Final Design Directives to PG&E on Modeling Follow-up for Topock Groundwater Remediation Project

Dear Mr. Yue and Ms. Innis:

Hargis + Associates, Inc., on behalf of our client, the Fort Mojave Indian Tribe ("the Tribe"), is hereby transmitting comments in regard to the above-referenced letter. The Tribe appreciates the U.S. Department of the Interior ("DOI") and the Department of Toxic Substances Control ("DTSC") efforts to address its concerns raised during the Topock groundwater remedy design review process. At this time, the Tribe would like to address some items relating to the model updates. The Tribe believes adopting these requests will strengthen and clarify the intent of the DOI/DTSC directives provided in the October 19, 2015, letter.

In regard to the model updates to be performed by the Pacific Gas and Electric Company ("PG&E") and its contractors, the Tribe requests the following:

- 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.
- 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.

**Other Offices:**  
Mesa, AZ  
Folsom, CA  
San Diego, CA

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

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Thank you for your critical evaluation of the modeling basis for the remedial design and for providing direction to PG&E for further refinement of the model. Please consider the Tribe's requests as outlined above and contact me if you wish to discuss these further.

Sincerely,

HARGIS + ASSOCIATES, INC.



Leo S. Leonhart, PhD, RG  
Principal Hydrogeologist

LSL:kas

cc. C. Coyle  
J. Hinkle  
S. McDonald  
N. McDowell  
L. Otero  
Y. Meeks  
T. Williams  
Tribal Representatives  
Technical Review Committee