



Department of Energy

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MEMORANDUM FOR MATTHEW S. MCCORMICK
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SCOTT L. SAMUELSON
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FROM: ALICE C. WILLIAMS *Alice C. Williams*
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FOR ENVIRONMENTAL MANAGEMENT

SUBJECT: Modeling to Support Regulatory Decisionmaking at Hanford

In January 2006, the Office of Environmental Management (EM) set a policy to establish a consistent use of commercially available and public domain software for a vadose zone and groundwater model platform to support regulatory decisions at Hanford. The objective was to produce a site-wide modeling system which is transparent and useable by both Department of Energy (DOE) and non-DOE personnel for replication and quality assurance; and to provide our regulators and stakeholders with high-quality, consistent vadose zone and groundwater analyses.

The modeling platform (i.e., waste release, vadose zone, and groundwater models) developed for the Tank Closure and Waste Management Environmental Impact Statement (EIS) provides a single integrated analysis of the vadose zone and groundwater at Hanford consistent with the terms of the 2006 settlement agreement. Now that the EIS is in its final form, and soon to be released, a workable approach for compliance modeling has been developed and implemented for the Environmental Restoration Disposal Facility Performance Assessment. Based on this approach, the Office of River Protection (ORP) and Richland Operations Office (RL) can begin modeling in support of your regulatory compliance efforts subject to the following requirements:

1. A phased process shall be followed to plan, scope, and carry out vadose zone and groundwater modeling analyses at Hanford. This phased process will include identification of modeling requirements (planning phase); development of facility-specific requirements and new information to identify the degree to which the modeling platform developed for the EIS meets modeling requirements (scoping phase); and conducting modeling efforts within scope (analysis phase). Transition of corresponding portions (e.g., modules used for the Integrated Disposal Facility) of the EIS modeling platform (waste release, vadose zone, and groundwater models including associated input data, all parameter assumptions, and documentation) will provide the starting point for subsequent regulatory compliance modeling activities.
2. Site-wide modeling efforts may be undertaken, where appropriately scoped and planned under the phased modeling approach identified in requirement 1 above, to fulfill remedial



action, permit requirement, tank retrieval and closure, and waste disposal modeling needs. Any changes from the EIS modeling approach, software, and/or input parameters to accommodate site/facility-specific needs or new information will follow the requirements of DOE Order 414.1D, *Quality Assurance*, for configuration control. Changes must be documented and the bases of the changes are subject to the approval by the RL/ORP Groundwater Vadose Zone Executive Council.

3. For modeling tied directly to the decisions made in the EIS (e.g., Waste Management Area C Closure or Integrated Disposal Facility authorization) consistency with the EIS analyses used to support the Record of Decision is important. A modeling case needs to be included that uses the same assumptions and methods used to support the EIS base case. Documentation of additional cases and assumptions is subject to approval by the RL/ORP Groundwater Vadose Zone Executive Council.
4. Simulation software used for modeling will meet DOE and EM software quality assurance requirements. Selection of simulation software that meets these standards will be based on efficiency for use in implementing the features, events, and processes necessary to adequately represent conceptual site models. Previously authorized modeling software at the Hanford Site (namely, RESRAD for screening use, STOMP for vadose zone and near-field groundwater modeling, and MODFLOW for groundwater flow modeling) remain applicable at Hanford, but additional simulation software may be used as long as the same standards are satisfied. Examples of additional simulation software include (but are not limited to) applicable software developed through the Advanced Simulation Capability for Environmental Management. Other examples of additional simulation software may include GoldSim™, which provides a stochastic modeling framework to meet sensitivity and uncertainty analysis needs (e.g., as used at the Nevada National Security Site and Savannah River Site) and REMChlor, which implements a simplified analytical model for chlorinated solvent analysis modeling needs.

You are also encouraged to coordinate and collaborate in your modeling efforts at Hanford with other efforts in the DOE complex. Your continued participation in DOE's Performance Assessment Community of Practice activities will facilitate this effort.

If you have any questions, feel free to contact me or Mr. Richard F. Moorner, Director, Office of Environmental Compliance, at (202) 586-5350.

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