# HANFORD GROUNDWATER/VADOSE ZONE EXPERT PANEL

**Prof. Randy L. Bassett**
**Dr. Edgar Berkey, Chairman**
**Dr. John G. Conaway**
**Prof. James R. Karr**
**Dr. Michael C. Kavanaugh**
**Dr. John Matuszek**
**Mr. Ralph O. Patt**
**Dr. Peter J. Wierenga**

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Mr. Richard A. Holten, Director
Groundwater/Vadose Zone Integration Project
DOE-RL
3350 Washington Boulevard
Mail Stop H009
Richland, WA 99352

Mr. Michael Graham, Manager
Groundwater/Vadose Zone Integration Project
Bechtel Hanford, Inc.
3350 Washington Boulevard
Mailstop H012
Richland, WA 99352

SUBJECT: Closeout Report from November 19-21, 1998 Expert Panel Meeting

Gentlemen:

This letter summarizes the results of the Hanford Groundwater/Vadose Zone Expert Panel meeting that took place in Richland on November 19-21, 1998, and serves as our official closeout report. Please excuse the delay in providing this report, as there was initially some confusion as to whether a written report was really necessary for this meeting. However, in the interest of compiling a complete record of our meetings, we agreed that it would be useful. The information presented here is consistent with the comments I provided publicly during the final session of the meeting on November 21.

The meeting focused on three main topics: (1) the operation of the Panel, (2) the status of the Long-Range Plan (i.e., Project Specification), and (3) the status of the Applied Science and Technology Plan. Although portions of both plans were provided to the Panel for review just prior to the meeting, it was recognized that both plans were "works in progress" at the time. The plans were on schedule to be completed and presented to DOE-Headquarters by December 18. Thus, the Panel's early reaction to the information presented should be treated as preliminary. The Panel will provide further comments on the plans at future meetings.

**Operation of the Panel**

The Panel spent considerable time in separate sessions discussing how the Panel should operate. We reached consensus on a number of key topics and issues. The Panel considers itself as an independent body and believes it can best serve the Integration Project and the Hanford Site in that capacity. How this independence will be recognized and accepted by the Project remains to be seen. We recognize and accept the responsibility that comes with independence. We believe it will take continued vigilance on the part of all concerned to assure that independence is maintained as a key characteristic of the Panel.

Our intention is to focus on key topics and issues determined by the Panel that are relevant to groundwater and vadose zone concerns at Hanford. We desire and welcome input on potential topics and issues, but in the end, the Panel will collectively set our Agenda.

The Panel recognizes that we have many customers to serve regarding our activities, such as DOE-Headquarters (UnderSecretary Moniz), DOE Richland Operations, Stakeholders, Tribal Nations, as well as Society at large. We intend to operate as a group when dealing with larger, crosscutting issues at the Site, and we will form Sub-Panels to deal with more specific topics, incorporating consultants if necessary.

During the November meeting, the Panel identified the initial areas on which we will focus. To determine these areas, we developed a comprehensive list of 22 possible areas of interest and then narrowed the list using the following three selection criteria:

1. The issue is relevant to the Integration Project.
2. The issue involves an immediate need and can influence the Project.
3. The issue is well defined.

Four areas emerged from our internal discussions, and individual Panel members were identified as champions for each area. The champions will have the responsibility to take the lead in that area and further develop and define its scope of activities. Given below are the areas identified by the Panel, as well as the designated champion(s).

| Focus Area | Champion |
|---|---|
| Interaction with Stakeholders and Tribal Nations (including hazard and risk issues) | Ralph Patt<br>James Karr |
| Peer Review Processes | John Conaway |

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| Modeling of Vadose Zone and Groundwater | Randy Bassett<br>Peter Wierenga |
| Field Investigations and Data Gathering | John Matuszek |

At the meeting, the champions presented their early thoughts regarding the efforts to be undertaken in each area, including the formation of Sub-Panels:

Interaction with Stakeholders and Tribal Nations This area was identified for a Sub-Panel as a way to develop a working relationship and on-going dialogue with some of the Panel's most important customers, namely Stakeholders, Tribes, and Society in general. The Sub-Panel met with the Hanford Advisory Board (HAB) at their scheduled December meeting in Portland, OR. The goal for that meeting was to inform the HAB members of the purpose of the Panel and Sub-Panel and to solicit HAB input into the process. Similar meetings of the Sub-Panel are planned with other Stakeholder groups and Tribes. It is the goal of the Panel to invite all Stakeholders and Tribes to attend our meetings and have an opportunity to give written and oral presentations on Vadose Zone/Groundwater issues. The Panel recognizes the necessity of Stakeholder and Tribal support for Hanford cleanup. This support can only be achieved by developing good avenues of communication for all parties concerned.

An early Sub-Panel task is to assure we are inclusive regarding concerns about risk as determined by all interested groups. Risk assessment is an important process and activity, but a risk analysis cannot be properly done until there is a careful and comprehensive identification of everything that is at risk. Using a model that leaves out significant things that are at risk would result in a rather empty risk assessment outcome. One task of this Sub-Panel is to assure that everything likely to be at risk is identified up front so that it can be included from the earliest phase of the Integration Project.

Peer Review Processes The ultimate goal of the Sub-Panel focusing on peer review is to ensure there is a robust, multi-level peer review system in place within the Integration Project. Such a peer review system is one of the five strategic objectives of the Project and a high priority of the UnderSecretary of Energy. In the short term, this Sub-Panel will gather information on any and all peer review systems currently in place. The Sub-Panel will also solicit ideas and opinions from Project personnel and others regarding what constitutes a good multi-level peer review system. This process will result in a status report to the full Panel with recommendations that will enable the Panel, along with Project personnel, to begin considering whether the existing peer review systems are optimal in terms of cost and benefit to the Project or if they should be modified.

Modeling of Vadose Zone and Groundwater There is some urgency in evaluating the status and progress of flow and transport modeling currently underway at the Site, and a Sub-Panel is the most efficient method for accomplishing this. This Sub-Panel will focus

initially on three key questions: 1) the model selection process, 2) integration of modeling efforts, and 3) the connection between data needs and data collection.

Model Selection Process. Fundamentally, models are only representations of the real system, as all models have error. One cannot necessarily select a best model; rather one selects and uses models that satisfy the criteria set out for the modeling exercise, frequently from among many possible models. The Sub-Panel will focus principally on the "process" and "criteria" by which vadose zone and ground water models are being evaluated and selected. Who is making this decision? Will they also determine which models are presently available, either at other National Laboratories or commercially, and if they can be used directly or expanded for vadose/groundwater modeling effort? The main strengths/weaknesses of these models for use at Hanford must be identified for both the vadose zone and groundwater, and whether single or multiple models are required.

Integration of Modeling Effort. The various GW/VZ modeling efforts presently funded by DOE must be identified, and an effort made to coordinate the modeling tasks. Models must interface either explicitly in structure or with appropriate information content. Specific data sets to be tested and decisions to select given models must be coordinated if the effort is to eventually be integrated. The integration process should address any duplication, but model development and use at this site has a long history. Modeling requires lead-time and produces momentum that is difficult to change; there is urgency in getting the specific details of this integration in place. The criteria used by the SAC in choosing their models must parallel the decision making process of the core projects to avoid incompatibility and wasted effort. When will the SAC set its criteria? Model selection must begin early for many reasons, among which are that: 1) all will undoubtedly need some modification and this should begin soon, 2) all require data and often the data needs are different between models, and 3) the needed model may not be available.

Data Needs and Data Collection. The selected model creates specific data needs. In this project, data are still being collected; therefore the modeling exercise can focus and assist in the design of the data collection process. It goes without saying then, that the model selection process is urgent. Where data are lacking, an effort will be made to expand data collection especially in projects that are now collecting field and lab data or plan to do so in the immediate future. Integration will also be sought with newer initiatives on controlled field experiments. These experiments need to be designed and executed such that model verification is a major outcome. Is this process actually underway?

Finally, this Sub-Panel can also serve as an independent focal point for all third parties that have interest in directing and evaluating this critical part of the program.

<u>Field Investigations and Data Gathering</u> The major concern of the Sub-Panel in this area is to assure that data gathering activities, particularly in the field, are tied to assessment needs. For example, Lockheed Martin plans to be in the field this summer

characterizing the SX Farm, perhaps even before the May Panel meeting. An effort will be made to determine what has been conceptualized for the workplan, including the thinking about thermal analysis recommended by the previous Vadose Zone Panel in its 1997 Report. Even more critical are the plans for cores and lab analysis, gamma logs, location of drill
holes, etc. From relevant document reviews and discussions with appropriate project personnel, it is expected that agenda items for consideration by the full Panel will be defined from the efforts of this Sub-Panel.

The Sub-Panel also plans to meet with Jacobs Engineering personnel to discuss their report on retrieval performance evaluation methodology for the AX Tank Farm. This report finds up to 7 orders of magnitude uncertainty in risk estimates. Because this work was done for the AX Tank Farm and the proposed fieldwork is for the SX Tank Farm, the Sub-Panel will attempt to assure coordination between model development and the imminent field measurement activities.

Jointly with other Sub-Panel members, meetings with the staff of the Center for Risk Excellence are planned to determine exactly how that organization fits into the overall scheme of risk-related efforts at Hanford. The proposed workplan of the Center will be reviewed to help evaluate the issue. Finally, meetings with PNNL staff working on the System Assessment Capability (SAC) for the Integration Project are also planned to determine how they plan to address uncertainty in the SAC model and how field programs will be integrated with the data needs for SAC model development and refinement.

**Preliminary Observations on Long Range Plan**

Although the Long Range Plan and Project Specification were not available in their entirety at the meeting, the Panel was able to draw some preliminary observations from a brief review of the material provided, as well as the presentations that were made at the meeting. The planning efforts of the Integration Project appear to be off to a good start. The potential efficiencies of integrated thinking regarding future technical and remedial activities on the Site are becoming clearer. Necessary linkages are becoming more apparent, and the need to change plans developed by individual projects that did not consider the whole picture are clearer.

The enthusiasm of the Project staff doing the planning was evident to the Panel, as the benefits of integrated, holistic thinking emerged. However, the Panel hastens to remind the Project that "Planning is NOT progress; it is only the prelude to progress." The Panel looks forward to reviewing and commenting on the completed Project Specification following its December 19 completion.

**Preliminary Observations on Applied Science and Technology Plan**

The Panel appreciated the opportunity to receive a status report on the development of the Applied Science and Technology (S&T) Plan and to interact with many of the lead scientists from the national laboratories who participated in its formulation. While the Plan reviewed by the Panel prior to the meeting was not complete, it was clear from the efforts to date that an excellent foundation has been laid for the S&T Plan. Integrating expertise from the national labs into defining the Plan and pursuing a systematic approach to its development were well received by the Panel.

At the time of the November meeting, the priorities among the individual work elements had not yet been set. The Panel emphasized the need to set priorities by doing a cost/benefit analysis regarding proposed work elements and determining what the paybacks were likely to be from conducting individual work packages. The Panel was concerned that funding for the proposed activities had not yet been established and indicated that a letter from the Panel would be written to Dr. Moniz supporting a budget allocation on the order of $10 million. The letter would further point out the need for the Integration Project to manage the funding as a way to assure that the benefits from any supported work would tie directly into Project needs.

The Panel looks forward to conducting a more detailed review of the Plan when it is completed.

**Planning Dates for Future Panel Meetings**

The Panel determined future dates for the next three Panel meetings which will be held at Richland during Fiscal Year 1999. The dates for these meetings are (1) February 1-3, 1999, (2) May 13-15, 1999, and (3) September 15-17, 1999.

**Next Steps for the Panel**

The next steps for the Panel revolve around three key activities: (1) reviewing and commenting on the final draft of the Project Specification, (2) reviewing and commenting on the final draft of the Applied S&T Plan and associated roadmap, and (3) initiating efforts on each of the four areas of focus identified by the Panel, including developing and defining Sub-Panel activities. The Panel will prepare a final report providing its comments on both the Project Specification and the S&T Plan following its February meeting.

Yours very truly,

Edgar Berkey, Ph.D.
Panel Chairman