



State of Idaho

DEPARTMENT OF WATER RESOURCES

1301 North Orchard Street, Boise, ID 83706 - P.O. Box 83720, Boise, ID 83720-0098
Phone: (208) 327-7900 Fax: (208) 327-7866 Web Site: www.idwr.state.id.us

File

DIRK KEMPTHORNE
Governor

KARL J. DREHER
Director

February 25, 2002

Dr. Charles E. Brockway
Brockway Engineering, PLLC.
2016 North Washington St., Suite 4
Twin Falls, ID 83301

Dear Chuck:

Thanks for your comments regarding the Eastern Snake Plain Aquifer Modeling Project, and more specifically, items covered in the October 31-November 1 Project Review meeting. I'll respond to your comments as you've listed them:

- 1) The project is on schedule. There is every reason to believe that, given continued funding, the project participants have the knowledge, skills, and desire to complete the project on schedule, despite mid-course adjustments. The official end date of the project is June 30, 2004, since we will be requesting funding for FY2004, the third year of the three-year project. In reality, the goal is for most of the work to be done by the end of December 2003, leaving the remaining six months of the fiscal year to verify our data and results and to complete the final report. No contingency plan has yet been developed if complete funding is not forthcoming. The Governor has included this project as one of his priorities in his budget request to the Legislature and indications from legislators are that there is strong legislative support for this project as well. The U.S. Bureau of Reclamation and the U.S. Geological Survey have provided letters indicating continued support, as has the Idaho Power Company.
- 2) The purpose(s) of the model have been outlined in documents dating back to our earliest attempts at drafting a strategy. In the IDWR decision unit requesting continued funding for FY2003 the purpose is stated as follows: "...to continue an established, coordinated interagency approach to enhance and refine the existing ESPA model to more accurately depict the present hydrologic system, with an emphasis on the interactions of surface and ground water. A framework has been developed to quantify estimates of uncertainty in model parameters and predictions."
- 3) There appears to be a bit of confusion regarding the model time discretization and the period of time which will be used for model calibration. The model will be calibrated to a 22-year data set, from April, 1980 through March, 2002. This period was selected to provide a wide variation in recharge and discharge. We concur that starting the model period on April 1 probably makes sense, particularly if we ultimately use 1-month stress

periods. Recharge and discharge data are being collected for the 22-year period. The current plan for model time discretization is to have 42 stress periods which are 6-month duration and 12 stress periods which are one month duration. There was much discussion at the last design review regarding whether the 6-month duration stress periods would sufficiently capture the intra-season changes. We agreed to look into calibrating the model using one-month duration stress periods for the entire 22 year calibration period. Much of the data is readily available on a monthly basis. However, going to one-month duration stress periods significantly increases the size of data files, the amount of time required for generating and balancing water budgets and the processing time required for automated parameter estimation. Noting the significance of the project deadline, we would like to hold open the option of staying with 6-month duration stress periods until it is clear that we can still meet schedule demands using one-month duration stress periods.

- 4) We concur that 'pseudo-data' is a more appropriate term than 'dummy data'.
- 5) We are currently attempting to do this, however, the task has proven to be more complex than most of us realized. Allan Wylie presented some early results of our sensitivity analysis. We have scheduled a one-day PEST seminar on March 20 with John Doherty, which we hope all of the design review participants will attend. John will provide an overview of parameter estimation tools, how they can be applied on the eastern Snake River Plain, and how to interpret the results. Although this task has proven to be more difficult than anticipated, we feel that this task is worth doing as it gives us experience which will help with the full model calibration and helps to identify the parameters with the most uncertainty.
- 6) We agree that many of the design decisions being made for this model may have later impacts on the use of the model for water management rules or policy. We are building the model so that depletion, or consumptive water use, can be adjusted based on local practice and source or irrigation water or method of application. If, at the end of the modeling period, it is felt that we do not have enough information to set these adjustment factors at reasonable levels, then they can all be set at one, providing no adjustment. As more research is done in the future, we will have the flexibility built into the model to accommodate these adjustment factors.
- 7) We will be doing a more sophisticated analysis of canal seepage where the data are available and where scale (the large canals) could make significant difference in the distribution of recharge spatially among the model cells. We believe that this level of effort is not appropriate for most of the canals and districts because breaking out seepage for the specific canals (rather than incorporating it into the total irrigated acreage in each cell) adds a level of complexity without improving the accuracy of the distribution of total recharge. The current Snake Plain model has the mechanism to use fixed percentages of diversions to represent canal seepage, but this mechanism is not currently being used, for the reasons above. We believe that there is not enough information to warrant a more sophisticated representation of canal seepage, therefore we will probably include canal seepage for only one or two major canals.
- 8) We concur that recharge on non-irrigated lands is one of the larger unknowns in the water budget, but we anticipate that SEBAL will help reduce the uncertainty. With the existing model, we cannot currently see a good method to test the sensitivity of the model to variations in dryland recharge. We will keep looking for a method to do so. In the new

model, we are designing the recharge program such that recharge on non-irrigated lands will be accessible to PEST for sensitivity analysis.

- 9) We agree that the concept of 'multiple' models has caused some confusion. We agree that the end product must be one, single parameterization, or model, which the group agrees most accurately represents the eastern Snake River Plain. Any additional parameterizations beyond that would be used to help quantify uncertainty in the model results. Our goal is to be able to use these additional parameterizations to quantify the uncertainty in the response functions generated using the calibrated model.
- 10) We agree that the recharge program should have an error check to ensure that the sum of outflows does not exceed the diversion. We will incorporate such a check. We would appreciate input on any additional checks which you feel are warranted.

At the design review meeting on March 21-22, we will introduce the concept of Design Documentation Papers, which will be used to document very specific design issues and the alternatives considered. Draft design documentation papers will be circulated for review and comment among the whole review team. Final design decisions will be made and documented in the final design documentation papers. It is our hope that this structure will give all parties a chance to review and comment on the more important design decisions, while still enabling the modeling team to progress with work, to help ensure a successful project completion.

We appreciate the time you have taken to provide us with your input and welcome further input at any time.

Sincerely,



Paul M. Castelin, P.G., Chief
Technical Services Bureau

cc: Hal Anderson
Donna Cosgrove
Electronic versions to ESHMC members

