MEMORANDUM

To: ESHMC
IDWR
Fr: Bryce Contor
Date: 26 October 2009

Re: Roles for ESHMC, IDWR, IWRRI in ESPAM3
Protocol for data, tools and methods for ESPAM3.

This memo summarizes the discussion held on 22 September 2009 of the roles for the ESHMC, IDWR and IWRRI in construction of ESPAM3 model, and of a protocol for use of data, methods and tools prepared by ESHMC members. It also incorporates the comments received from ESHMC member Jennifer Johnson of US Bureau of Reclamation. Johnson's comments were distributed to the ESHMC. No other responses were received. The discussion and memo are part of the fulfillment of Task 1 and Task 4 of the contract between IDWR and IWRRI. The memo has three purposes:

1. Communicate to ESHMC members who were not in attendance.

2. Document input received from ESHMC in response to the first draft of this memo.

3. Formally document ESHMC input, as part of IDWR's decision process on roles and protocol for ESPAM3.

The slides presented in the meeting are available in the meetings folder on the IDWR Website as file "Task_Assignment_ESPAM3_20090915.ppt." Photos of the whiteboard are saved as files "S5034811.jpg," "S5034812.jpg" and "S5034813.jpg," also in the meetings folder on the Website.

Roles

The slides presented a preliminary list of roles for ESPAM3, reproduced below. In our discussion we did not strike or add any roles from this list, though we discussed also potential roles for the Eastern Snake Plain Aquifer Comprehensive Aquifer Management Plan Committee (CAMP). The list of roles from the slides is:

ESHMC

- Provide technical input to IDWR
- Review technical work
- Propose technical methodology

- Perform technical work as requested by IDWR

IWRRI

- Perform technical work as directed by IDWR
- Propose technical methodology

IDWR

- Direct technical work
- Choose technical methodology
- Perform selected technical work

Regarding the role of CAMP, one suggestion was that model development was the realm of the ESHMC and that perhaps application of the model for stakeholder questions (i.e. scenarios) was the realm of CAMP. We did not reach consensus on this point, though it appeared that we all agreed that model application in support of administrative decisions is clearly and exclusively the role of IDWR. If CAMP is to have a role in model application, ESHMC members suggested that IDWR consider the following points:

- Model applications for stakeholder questions should not exclusively be in the realm of CAMP; some ESHMC members wish to also have input.
- CAMP may not have the technical expertise to formulate and understand the results of scenarios and may require assistance from the ESHMC.
- Perhaps a CAMP member should sit on the ESHMC (and/or vice versa).

As part of this discussion, we agreed that Hal Anderson and Brian Patton would bring input from CAMP to the next ESHMC meeting on the kinds of questions that CAMP members expect to ask of the model. The purpose of this is to be sure that we consider all expected applications as we debate design decisions. As part of this discussion we noted that the questions being asked of the model are changing. We also discussed the fact that many of the stakeholders' questions go far beyond the stress-impact relationships that can be obtained from an aquifer model.

We considered additional activities that the ESHMC might properly consider. We generally agreed that if ESPAM3 or ESPAM4 is a linked surface-water/groundwater model, the surface-water model, groundwater model and linkage should all be subject to ESHMC technical input. We started a discussion of the concept of data management as an overarching activity that is broader than any single model, with the suggestion that ESHMC may also have a role in development of a data management system. However, we moved on to other topics before completing this discussion.

Protocol

As a starting point for discussions, the slides presented a protocol for use of basic data, processed data, processing methods and processing software provided by ESHMC members. This protocol is:

> *IDWR anticipates continuing its contract with IWRRI for the development of ESPAM version 3. During committee meetings, an ESHMC member may offer an approach or method that is different from the course that IDWR or IWRRI is pursuing.*
>
> *If the committee concurs that the approach or method has potential merit, then IDWR will invite the member to develop his/her idea for presentation to the committee. After receiving the presentation and discussing the concept, the committee may recommend that IDWR consider the alternative approach.*
>
> *At this time IDWR will further evaluate the technical approach, including datasets relied upon, and report its determination back to the committee*

We also discussed the fact that these evaluations of technical approach require a significant commitment of IDWR resources, implying that IDWR would not be able to evaluate all proposals that potentially could be brought forth. Allan Wylie reported that in the case of the on-farm water-budget methodology, review of outside work required less time and effort than would have been needed for IDWR to build and refine the methodology itself.

We identified two concerns with outside technical work that have been discussed in the past:

- Resources may control the influence that a particular stakeholder can have upon the final model.
- The department must be able to own and defend the model.

These continue to be very serious concerns for at least some members of the ESHMC.

Additional comments and discussion on September 22 included the following:

- Transparency is vital.
- There must be a vetting process.
- Is the department familiar with all the technology and software that may be used by ESHMC members?
  - If the department chooses to accept outside work, it should specify standards (software, data format).

Additional discussion on vetting included the following:

- Data should be posted as early as possible, so that everyone has an opportunity to review them.
- Is there a mechanism to drill down to methods, data collection sites, instrumentation and methodology?
- IDWR responded that in the case of outside return-flow data, an IDWR engineer inspects the sites and instrumentation on an annual basis. The discussion moved on before IDWR could give a complete description of the other quality-assurance activities it currently undertakes with outside data.

Conclusions

It seemed that most ESHMC members (including Johnson in her response) were comfortable with the roles outlined in the presentation, and with the concept of accepting basic data and perhaps processed data from stakeholders and/or ESHMC members. A more robust and transparent vetting process may be in order, however.

In the meeting there seemed to be less consensus on the appropriateness of using methodology and software from representatives of stakeholders. On one side of the argument is the correct assertion that it is improbable that IDWR and IWRRI will "have all the good ideas." On the other side is the very real danger that stakeholders or alliances with more resources may gain undue influence upon the final form of the model. The single response to the original memo supported use of methodology and software provided by stakeholders, with proper vetting.

Request for Input

We requested two types of input from the ESHMC, listed below. The questions are posed exactly as they were in the September 2009 memo. The single response received is interleaved (*italic blue text*) with the original questions.

1. Please correct any misrepresentations or omissions that this memo makes of the discussions on September 22.

   I was not in attendance on September 22.

2. Please provide additional response to these topics (or initial response, if you were not in attendance). Particularly we are interested in the following:

   2.1. Roles

2.1.1. Should any of the roles outlined above for ESHMC, IWRRI and IDWR be removed?

Roles look fine to me.

2.1.2. Should additional roles be considered for ESHMC, IWRRI and IDWR?

Roles look fine to me.

2.1.3. Should CAMP have any role in model development?

I do not think that most members of the CAMP committee have the expertise to direct model development. I do think, however, that they have a role in directing scenarios and that the scenarios should help guide model development.

2.1.4. Should CAMP have a role in model application (scenarios)?

See previous response.

2.1.5. Should a CAMP member sit on the ESHMC?

I do not think it is necessary for a CAMP member to sit on the ESHAMC.

2.1.6. Should an ESHMC member sit on CAMP?

I think it would be helpful for a member of the ESHMC to attend CAMP meetings in which the model is discussed to help answer questions about the model and its capabilities.

2.2. Activities

2.2.1. Are there additional activities (such as technical input to surface-water modeling or to a data-management process) that IDWR should invite the ESHMC to engage in?

I do not think that expanding the scope of the ESHMC would be beneficial.

2.3. Protocol for outside data and methods.

2.3.1. What is the appropriate role for data from outside sources (particularly from stakeholders or stakeholder representatives)?

Additional data, from any source, will likely help us to better understand the system and improve the model. It is necessary to "ground truth" all data regardless of the source. I think that if the data can be verified, it should be included in the modeling process.

2.3.2. What is the appropriate role for standard methodology (i.e. methodology reported in literature or widely applied elsewhere) promoted or proposed by ESHMC members?

Standard methodology is great for modeling studies because one can point to the literature and show that it is a valid method (even though the methods are often not perfect).

2.3.3. What is the appropriate role for new methodology promoted or proposed by ESHMC members?

Since this model can potentially be brought into litigation, it is important that all methods can be defended. New methodology should not be used without proper documentation and vetting.

2.3.4. What is the appropriate role for tools or software (i.e. implementation of methodology) developed by ESHMC members?

Tools or software developed by ESHMC members can be used in the modeling process if they have been vetted and documented.

2.3.5. If outside data, methods and/or tools have an appropriate role in ESPAM3 development, what vetting and quality-assurance protocol should be applied?

IDWR should designate a person that can verify the data, methods or tools before they are used in the modeling process. If there is limited time/budget and verification cannot be performed, the data/method/tool should not be included in the modeling process.