

ESHMC Meeting Notes June 22nd, 2012

Item 1 - Introductions were made, and an attendance list was circulated. The following were present at the meeting:

- Rick Raymondi
- Allan Wylie
- Jennifer Sukow
- Chuck Brockway
- David Hoekema
- Mike McVay
- Chuck Brendecke
- Dave Colvin
- Mat Weaver
- Sean Vincent
- David Blew
- Max Dakins
- Gary Spackman*

***Present at meeting but did not sign attendance sheet**

John Koreny, Jon Bowling, Jennifer Johnson, Bryce Contor, Greg Sullivan, Lyle Swank, Stacey Taylor, Rick Allen, and Willem Schreuder joined the meeting via polycom.

Item 2 – During the introductions, Rick Raymondi announced that Dave Colvin had been added to the ESHMC membership list.

Item 3 - Stacey then briefed the committee on the progress of developing figures for the final report. She said that she had approximately 6 figures to finish and that additional figures would be provided by Allan Wylie. Stacey indicated that she needed water level contours from IDWR and that there had been no progress on the text. Bryce Contor said that he had the current version of the document and that he needed to incorporate the latest comments. Allan mentioned that the figures needed to be merged into the text. Bryce said that individual chapters had been preserved. Chuck Brendecke asked where the shape files that were the basis for figures could be found. Rick Raymondi said a sub-folder associated with the final report would be developed.

Item 4 - Mike McVay discussed the purpose of the work that will be taken on by the ET subcommittee (i.e., to determine the best way to incorporate METRIC data into the next version of ESPAM and how to determine ET for the intervening years). Rick Allen said that Landsat 5 is not currently functioning and has not been functioning since last November. Rick added that Landsat 8 is hopefully on time for deployment next April. He added that Landsat 7 is the only functioning satellite, and it is acquiring data every 16 days with 20% of the images missing.

Item 5 – Max Dakins introduced herself to the committee. She is a professor from the University of Idaho – Idaho Falls campus, and she presented her recommendations for statistical measures to evaluate the fit of the ESPAM version 2 validation data. Max indicated that she talked her approach through with Dr. Gary Johnson, and she began by saying models are never truly validated. She advocated using the root mean squared error (RMSE) as a measure of the model fit and presented an approach that would capture how the fit varies with time. She said that by using 2-year, non-overlapping periods, a total of 14 RMSE values could be developed for the model period. Max said that the values would be independent, and the distribution over the calibration period would indicate how the RMSE validation value would fall within the range of calibration values. She indicated that the negatives for using this approach include that since the values are squared before summing, large deviations are intensified.

The second recommendation given by Max was using a robust measure known as the median of absolute values of deviations from the median or the median absolute deviation (MAD). Max indicated that she thought about using R^2 as a statistical measure, but R^2 would not provide any more information than the RMSE. She also said that the interquartile range would not add to the analysis.

Rick Allen asked why the mean absolute deviation was not considered. Max said that she considered other statistical approaches, and decided upon the RMSE and the MAD because these two approaches are quite different. Chuck Brendecke cautioned that the 2-year, non-overlapping time periods in the RMSE approach are not completely independent because of the “memory” of the system with carryover from previous years and that the serial correlation in the system takes time to manifest. Max responded that her approach was pure in that the data were not used twice and that the data do not have to be completely independent. She added that it is more important to analyze how model validation results fit to the model calibration period data over time and to see how the results fall within the range.

Bryce Contor said he had pushed for the statistical analysis and that one has to be aware of serial correlation, but he trusted the answer given by Max. Chuck Brendecke asked if the RMSE was parametric and if the MAD was not. Max said yes to both questions and added that the MAD is a robust method. Chuck Brockway asked if there was any merit to stochastic pairing or random pairing. Max explained that the validation approach that she recommended is successive two-year pairing, and it is not random. She added that it is better to compare successive two-year pairings. Max said you could pair two dry years, two wet years, or two years that didn't fit well, but she still advocated the successive two-year pairings.

Chuck Brockway agreed with Max, but then asked if two years should be considered as a real or legitimate validation. Max said that modelers often use shorter time periods for validation and felt that it provides a valid comparison. She added that if there is a poor fit, it tells you something, and if it does a good job you move on. Max completed

her thought by saying that you will never know how well the future can be predicted, and even if the fit is good, the future trend or conditions cannot be guaranteed.

Willem said that some time series data fit better in certain seasons, and he asked if we should be looking more closely at summer or winter flows. Max said that she was looking at the overall model fit, and if you want to look closely at data that are auto-correlated, you might need to use spatial time series statistics. She said that her approach is not applicable to Willem's issue, and she suggested that a geo-statistician might be able to address his concern.

Dave Colvin said that some plots are somewhat unique and that the R^2 was used as an indicator of the fit. He asked if the R^2 could be misleading for this purpose. Max said that you might get some insight into the data from the R^2 . Bryce said he was more comfortable with the MAD approach. Max added that the approaches are pretty different and non-duplicative.

Rick Allen said that he was still troubled with the MAD, and he felt that approach discards information if there is only 1 median, and it is only one of 10,000 data points. Rick then asked if you could see how the RMSE fits in the data distribution. Max said that Allan will show us that as part of his presentation. Rick Allen said that the R^2 is similar to the statistics used for the RMSE, but the RMSE is an absolute type of error, and the R^2 independent. Willem said he agreed with Rick Allen and added that the R^2 of the time series under-predicts the variation in spring flows. Max agreed that the R^2 might be a valid tool to add to her recommendation.

Dave Colvin asked if un-weighted data were used for the plots showing the data fits, and Allan said yes. Willem said weights were applied for a reason. If the fit analysis was done in a weighted manner, it would show what we told PEST. Willem thought that using the weighted data was a good idea. Allan Wylie said we could do both (weighted and un-weighted). Bryce agreed with Willem, and Max agreed that both plots would be informative. Chuck Brockway asked how weights would be incorporated into the analysis, and Allan said that you multiply the residual by the weight, scale the product and calculate the standard deviation. Bryce concluded the discussion by saying that he appreciated Max and her work.

Item 6 - Following the discussion led by Max Dakins, Allan showed some statistics on the calibrated data sets and followed recommendations by Chuck Brendecke to use Box and Whisker representations of monthly gains and spring discharge versus average monthly data. Bryce said that the data sets have means and medians and one or the other would be preferable. Allan said he would use median values. Rick Allen pointed out that the end of the datasets will have a larger departure, and Allan agreed.

Allan pointed out that he created the Box and Whisker representations in Excel. He said that he had trouble when the data crossed the zero line, so he used stock plots instead of box-and-whiskers for reach gains and box-and-whisker plots for spring discharge. Allan also said he could not produce a real Box and Whisker for reach gains

(that crossed 0) and show the median. Mat Weaver said that he had some ideas on constructing the Box and Whiskers, and Allan said he would look at Mat's approach.

Allan Wylie then presented an application of the statistical measures recommended by Max Dakins to evaluate the fit of ESPAM version 2 validation data. He showed the calibration data sets and the validation data fit for water levels, Snake River gains, and the spring reaches. He also presented the RMSE and MAD for each. For the gains, Allan said that the graphs will change with different weights on different river reaches.

Rick Allen asked why the seasonality of the spring reach gains is not evident in the data. Allan said part of the spring reach gains is base flow which discharges from the lower part of the aquifer. Willem disagreed saying that only 25% of the gains is base flow, so Allan's explanation is not complete. Allan agreed and said that he did not give a full explanation. He said that there is no transient representation of the flow that discharges from Class C springs. He added that there are only ranking targets with no seasonality. Willem said that in addition, we have constrained the system to match the head targets and with spring elevations, which makes PEST's task of matching the seasonality in the measured data impossible.

Allan explained the impact of the gage elevation on the modeled vs. measured data match for Briggs Spring. Chuck Brockway asked why we don't change the elevation. Allan said that for the A and B springs, we expected the validation data to be outside the range of calibration. Chuck then asked if Briggs Spring could be considered an outlier. Allan conceded that the data demonstrate the worst fit and that the modeled spring elevation based on Covington and Weaver is very low. Chuck said that we are missing the amplitude or seasonality, plus there is a bias with respect to the elevation selected.

Chuck then asked what can be concluded from the data, and Max said that the validation data are all inside the range of calibration except for one instance and that she doesn't see anything that invalidates the model.

Item 7 - Allan Wylie presented the results from the 1900 validation effort. He began with showing the source of the data and the assumptions made. Allan explained why average values from the 1988 – 1992 period were used for NIR, TRB, PCH and ET. Willem asked whether 0.7 was taken as the ET adjustment factor to account for lower crop yield. Jennifer Sukow said yes, the estimated adjustment factor was based on crop yield data from historic State Engineer reports and NASS data, which indicate that crop yields were lower than today. Willem questioned why we think there has only been a 30% increase in yield with all the improvements and advances that have occurred in the last 20 to 30 years. Jennifer said she would post the data that were used to estimate the adjustment factor.

Allan showed the irrigated area that existed in 1900. David Hoekema indicated that the Milner-Gooding Canal was completed in 1905. Allan discussed the available water level data and showed a water table elevation map. Willem asked if the available data

were depth-to-water measurements or actual elevations. Allan said that it was depth-to-water measurements, and all were in the range of 100 feet. Willem asked how the wells were drilled, and Allan said he did not know and added that they were not hand dug. Willem recommended checking land surface elevations vs. the modeled water level elevations to see if modeled heads are below land surface in areas without wetlands. Chuck Brendecke suggested checking an early document by Mundorf and the RASA report for early water level data.

Allan then discussed the early spring data. Rick Allen asked if transient data were available, and Allan said no, the 1900 validation was modeled as steady state. Rick Allen said with the onset of irrigation, there would have been a change in aquifer storage, and he wondered if that would be a problem for the validation effort. Allan said it could have led to overestimating the volume of water in the aquifer, but he was not overly concerned. Willem asked when the Curren Tunnel was excavated. Jennifer Sukow said she was not sure. Allan said the information regarding a tunnel mentioned by Israel Russell is puzzling and does not describe the location of Curren Spring. The location of the early measurement of Billingsley Creek is not specified, and may include springs downstream of Curren Spring. Rick Allen asked if the current flow values are available, and Allan said the information would be provided. Chuck Brockway said that spring flow measurements were made by the Twin Falls Land and Water Company. Jennifer Sukow said that a report by Stearns cited the Twin Falls Land and Water Company, but other sources indicated the measurements were made by Stannard who was commissioned by the State Engineer to measure the springs in 1902. The data were first published in the 1902 report of the State Engineer. The overall conclusion regarding the 1900 spring effort was that the model was not invalidated by the results.

Item 8 - Allan presented the results from recent predictive uncertainty analyses. He began with a table of completed analyses. The table contained the calibrated impact, maximized impact, and the minimized impact of the stress applied at the centroid of a water district on a reach or spring. Allan also showed the model version used for the various analyses.

Allan then discussed the results of the predictive uncertainty analyses from the stresses applied at WD 110 and the impacts realized on near Blackfoot to Minidoka reach. The results showed hardly any change between the calibrated impact and the maximized and minimized impacts. The same (hardly any change) was true for the results of the stresses applied at WD 33 and the impacts received at Clear Lakes Springs and the near Blackfoot to Minidoka reach and for the stresses applied at WD 140 and the impacts on the near Blackfoot to Minidoka reach. However, Allan indicated there was a more significant change or difference between the calibrated impact and maximized and minimized impact on the near Blackfoot to Minidoka reach from the stresses applied at WD 120. There was also a significant difference between the calibrated impact and the maximized impact on the near Blackfoot to Minidoka reach from the stress applied at WD 34. The uncertainty analysis for the minimized impact on the near Blackfoot to Minidoka reach from the stress applied at WD 34 had not yet been run.

Willem asked for an explanation of the pie diagrams. Allan indicated they were indicative of the response functions less base flow. For the stress applied at WD120, Allan said that when the impact at near Blackfoot to Minidoka is minimized, the impact is pushed upstream, and when the impact is maximized, water is directed to the near Blackfoot to Minidoka reach from a number of areas. Allan then said the results provide clues as to what can be done to make the model stronger and reduce uncertainty in the next version. Allan said that the analyses he repeated with the new calibration show similar uncertainty to the runs completed with the old calibration. He recommended that he keep moving forward with new runs, and not re-do any additional runs with the new calibration.

Chuck Brockway asked what can be concluded from the runs. Allan said the model is tight for a majority of the situations, but wiggle room was found with some runs. He said that he thought it would help if the reach gains and losses were filtered. Willem said he likes trying to capture seasonal fluctuations, and he recommended calibrating to absolute data and then use the Butterworth filter. Allan agreed and said it would be part of a long list of items to accomplish in the next version of the model. Chuck Brockway asked if there would be separate uncertainty and validation reports, and Allan said yes. Chuck then asked what additional runs would be undertaken. Allan said he is about half done with the uncertainty runs now, and that WD 100 and the Rexburg Bench had not been done. He said there was marginal value in analyzing the impact at Blue Lakes, and that he had planned to analyze the impact on the Henrys Fork.

Item 9 - The next item of discussion concerned the development of transient response functions from ESPAM version 2. Bryce Contor began the discussion by providing the committee an overview of how response functions can be used. Bryce indicated that he finds the response functions for each model cell, and the effort requires lots of computer time. He asked the question if anyone else would use them. Chuck Brockway asked if Bryce's description was similar to the current transfer spreadsheet. Bryce said yes. Chuck Brockway said that IDWR should develop a new transfer tool when ESPAM version 2 is adopted, and in this regard, he agreed with Bryce that IDWR should develop the new transient response functions. Bryce said that he would like a data table of response function. Chuck Brockway said Bryce's recommendation for a data table is the first step, and it should be done. Chuck Brendecke and David Hoekema also agreed and supported the recommendation by Chuck Brockway. Rick Raymondi said that IDWR will respond to the committee request.

Item 10 - Jennifer Sukow provided the committee a comparison of ESPAM version 2 with version 1.1 via the results from running the curtailment scenario. She first reviewed what was done in the 2006 Curtailment Scenario that was developed by IWRI and indicated that curtailment of groundwater irrigation was modeled for 5 selected priority dates. The area inside the model boundary was considered, and no administrative boundaries were applied. Jennifer said that the curtailment scenario was accomplished using the numerical superposition version of ESPAM 1.1, the average precipitation from 1961 – 1990, and the average ET from 1980 – 2001. She added that the

predictions included the steady state response to continuous curtailment, the transient response to curtailment for 150 years, and the transient response to a one-year curtailment.

Jennifer reminded the committee that the Draft Report comparing the two model versions had been posted on the ESHMC web page for review. She said that for the comparison, the numerical superposition version of ESPAM2.0 was used and the model runs were done with well files from the ESPAM1.1 scenarios. She added that another model run was done with well files created using ESPAM2.0 input data including the 2012 POD file, the 2008 irrigated lands dataset, the average groundwater fraction raster, the average precipitation from Nov 1998 – Oct 2008, and the average ET from Nov 1998 – Oct 2008.

Jennifer discussed the results of the comparison by showing graphs of the predicted response to curtailment of groundwater rights junior to 1870, 1949, 1961, 1973, and 1985. Each graph provided the predicted response at the river reaches and spring reaches for the ESPAM2.0 run, the ESPAM2 run using the ESPAM1.1 well file, and the ESPAM1.1 run. She indicated that the volume of curtailed consumptive use for a given priority date is 17% to 21% higher using ESPAM2.0 input data and attributed this to improved representation of irrigated lands, updated ET data, improved representation of ET adjustment factors, updated precipitation data, and updated water rights data. Jennifer also said there were changes in relative responses of some spring and river reaches as a result of improved and updated calibration targets, improved and updated water budget input data, and the addition of general head boundaries.

Bryce said it would be nice to split the near Blackfoot to Minidoka reach, and Jennifer said she would revise the tables to break this out. Bryce also said that the two models are the best available technology, and Jennifer's analysis gives good insight to the improvements. Lyle Swank said the USGS data is not accurate enough to pin point flows to reaches and that precision is more defined than accuracy. Greg Sullivan said that in addition to listing the 5 factors that contribute to the 17 to 21% higher volume of curtailed consumptive use, it would be important to know which factors are most important. Jennifer said this would be difficult because the number of irrigated acres and CIR per irrigated acre were not reported in the 2006 report on the ESPAM1.1 scenario. Bryce Contor offered to find the reading input files from the ESPAM1.1 scenarios. Jennifer agreed to review the reading input files and add to the analysis of differences in input data presented in the draft report. Chuck Brockway asked if the 5 listed items were components of the water budget, and Jennifer said yes, but only part of the water budget. Bryce said that the ESPAM1.1 curtailment scenario used the year 2000 representation of irrigated lands, not the year 1992 representation that was used for calibration of ESPAM1.1.

Greg Sullivan why there was a redistribution of impacts at the springs. Jennifer said that there were changes in targets and lots more targets, the spring elevations were different, there was a change in the T and S distribution, and there apportionment of base flow that was involved. Greg asked for a tabulation of the changes in targets, and

Jennifer said that was done in the report. Greg asked for the changes in the target vs. the actual responses to be plotted. Jennifer reminded the committee that the targets are going to be responsive to all components in the water budget.

Chuck Brockway said the differences between ESPAM version 1.1 and 2 are some indication and measure of either the uncertainty of the model process or the conceptual model. Bryce said there are many other sources of uncertainty. Willem said it gives us a glimpse of how all things changed and to what extent they represent the uncertainty of the modeling process. Jennifer said that the improvements represent a reduction of uncertainty. Willem said that for every different prediction, there is a different level of uncertainty.

Jennifer went on to discuss the long-term transient comparison which involved a simulation of 150 years of continuous curtailment and comparing both the ESPAM2.0 prediction (with ESPAM2.0 input data) to the ESPAM1.1 prediction and comparing the ESPAM2.0 predicted response (with ESPAM1.1 well file) with the ESPAM1.1 prediction. She added that the first comparison provides the net difference, and the second illustrates differences in model structure and model parameters.

Jennifer went through slides that showed the comparison discussed above for curtailment of groundwater rights junior to 1870, 1949, 1961, 1973, and 1985 for each reach. She also showed graphs of the head response at selected locations that showed the same comparison. Jennifer summarized the comparison of long-term transient results by saying that the response at the near Blackfoot to Minidoka reach and at springs downstream of Milner reaches 90% of steady state more quickly than in ESPAM1.1, the head response at selected locations near American Falls, in A&B Irrigation District, near Craters of the Moon, and in Thousand Springs also approach steady state more quickly than in ESPAM1.1. Jennifer then said that the near Blackfoot to Minidoka reach approaches steady state in the range of 20 years faster, and the springs reach steady state up to 30 years sooner. She added that the results reflect changes in aquifer transmissivity and storativity in the calibration of ESPAM2.

Greg Sullivan asked why some reaches and springs approach steady state faster, and Willem and Jennifer said it was a result of a change in the specific yield and transmissivity. Jennifer added that more transient targets and monthly stress periods contributed to the changes in calibrated parameters.

Rick Allen suggested looking at the transient responses to drought at the springs. Chuck Brockway asked if springs continue to decrease in flow, how can the model be used to define the cause if these results say it is not pumping. Jennifer said that pumping is not the only stress and that it is the actual water budget not the average water budget that was put into the model. Allan said the model is over predicting what is happening to the springs at the end of the calibration period and that we may have the wrong crop mix, or wrong crop irrigation requirement (CIR), which would result in the wrong value for incidental recharge.

Regarding the graphs of the head responses, Chuck Brockway asked why the response predicted by ESPAM2 is always higher, even when the same well file was used. Jennifer said that it not always the case and gave A&B as an example. Bryce said the heads reflect changes in consumptive use and specific yield (S_y). Jennifer said that it is largely the change in S_y when comparing the ESPAM2 response to the ESPAM1.1 well file with the ESPAM1.1 results. Willem said that you could attribute the head responses to S_y to early time data, but not as you approach steady state. Jennifer said that it must be the result of changes in transmissivity in the later stages.

Jennifer then discussed the short-term transient results. She said they illustrate the seasonal response patterns resulting from the change in the discretization of model stress periods, She also said that in ESPAM1.1, consumptive use from groundwater irrigation was applied as a constant stress at an average seasonal rate from May 1 to October 31, and ESPAM2 applies consumptive use from groundwater irrigation at an average monthly rate. She showed graphs of the short term responses for the river and spring reaches generated by ESPAM2.

Greg Sullivan requested that the graphs have tick marks on April 1 at the beginning of each irrigation season and another tick for October 1 at the end of the irrigation season. Jennifer agreed, but she pointed out that the seasonality of the graphs will be different for the springs in comparison to the reaches. Chuck Brockway said that the graphs for the spring reaches should be similar to the reach gains. Jennifer disagreed and said that she did not add on the general head boundary. Chuck Brockway conceded that it was not a direct comparison. Jennifer then said that a smaller amount goes to the general head boundary. David Hoekema asked if the change in S_y could be shown, and Jennifer agreed to show the change by subtraction on a map. Chuck Brendecke asked for the change in T to be mapped, and Jennifer agreed. Greg asked for flow lines to be shown on both. Willem agreed to send his figures showing the flow lines in a better format to include in the report.

Item 11 - IDWR began a general discussion regarding adoption of ESPAM version 2 for use by the Department. Bryce and Willem both offered that they agree with the concept that the new model is sufficiently better, but how it should be used is a matter of discussion. Allan Wylie suggested that the first question is whether ESPAM2 is better than ESPAM1.1. Chuck Brockway said version 2 is better than version 1.1 and added that if there are analyses that you can't use the model for, then the committee should offer advice for that. Allan said the final report will discuss the items for which the model should not be used. Willem said it is difficult to enumerate all uses and inappropriate uses, and he suggested that the Director could ask the committee regarding whether it is appropriate to use the model for a particular use.

Greg Sullivan said the new model is generally better than version 1.1, but it may not be better in every single instance. Greg went on to say that the new model has cautions for uses, and it is good for regional uses. He said that there are cautions for using the model for individual springs and wells, cautions on particular times (e.g., monthly), but it is good for long-term predictions.

Willem said that Greg has expressed good cautions, and ESPAM2 should be used for many springs but maybe not all springs. Chuck Brockway asked if Willem said that the model should not be used for individual springs. Willem responded that if we have a dominant spring in a cell, and the model is calibrated to that spring, then it is probably OK, but the model should not be used to predict to a lesser spring in a cell for which it is not calibrated. Bryce said it is impossible to measure the aquifer heterogeneity between pilot points, and the numbers at nearby springs may be meaningless.

Allan suggested defining the caveats in a white paper. Chuck Brockway said if the Department uses the model for a specific purpose, there will be a hearing on whether the model is appropriate. Director Spackman had joined the meeting, and he said the Department has an active Delivery Call involving Rangen, Inc. He also said that Rangen has asked the Department to use version 2. He went on to say that there is a status conference on Wednesday, and there will be a need for the model. Director Spackman requested a statement from the committee that version 2 is the best available tool. He said he would then craft an Order that will indicate that the Director will use this tool. Allan Wylie said that with regard to the scale to use the model, there should be an opportunity for those who are not party to the Rangen Delivery Call to have a say. Jennifer Sukow said that the White Paper is a possible venue.

Bryce reminded the committee that Rangen questioned the use of a trim line. Director Spackman agreed that the trim line will be an issue. Chuck Brockway said there are two issues: 1) can you use ESPAM2 to simulate the impact of junior ground water pumping on a spring; and 2) should you use uncertainty as a justification for the trim line. Willem said that the second issue should be changed to: 2) if it is determined that there will be a trim line, what should be the basis for it. Chuck Brockway said that the trim line is not related to uncertainty. Greg Sullivan said that application of the model is always a subject of a hearing, and the statement requested by Gary would ease concerns. Bryce agreed.

Director Spackman reiterated that he wants something from the committee that moves it on from version 2. He said he had a concern with a white paper because statements within could be part of a hearing. Dave Colvin asked if the previous white papers could already bring the crafters into a hearing. Allan said he would hate to have all uses of the model decided by the Rangen hearing and that he wanted to have a free and open exchange regarding model use. Dave Colvin said there should be a caveat that it is a case-by-case basis regarding how to use the model. Allan Wylie asked if precedents will be set in the Rangen hearing, and Director Spackman said yes.

Rick Raymondi questioned the committee saying “Does anyone disagree or feel otherwise that version 2 is the best available tool for the Department to use for hydrologic analyses.” Greg Sullivan said it will be hard to agree on language, and something should be circulated for committee agreement. Bryce said that version 2 may or may not be the best available tool. Bryce then said version 2 is an improvement over 1.1, but it may not be the best for all locations. He added that in general, it is

probably true that it is the best tool, but there probably some areas where version 1.1 is the best tool.

Gary Spackman then said it is valuable to all concerned that the committee states that the task to develop version 2 is finished. He said he expects that there will be improvements, but we are finished at this junction. Gary said he will protect experts from lawyers that will undercut any statements made. Greg Sullivan asked what if there is a different hearing officer. Gary conceded that would be an issue for consultants to consider.

Rick Raymondi offered the following statement for the committee to consider: "if it is appropriated to use a model, the committee is done with version 2, and the Department should go forward using the new model". No one disagreed, but Greg said he would like time to look at the language. Rick Raymondi said he would circulate language for the committee to consider.

Item 12 - The committee agreed that the next meeting should be September 12th, 2012.

DECISION POINT SUMMARY

The following was agreed upon:

- 1) IDWR agreed to make both weighted and un-weighted residuals for the plots showing the validation fits.
- 2) IDWR agreed to post the crop yield data that were used to estimate ET for the 1900 validation scenario.
- 3) Willem Schreuder recommended and IDWR agreed to check land surface elevations vs. modeled water level elevations in the 1900 validation scenario to see if modeled heads are below land surface in areas without wetlands.
- 4) IDWR agreed to respond to the committee request regarding the development of a data table of transient response functions from ESPAM version 2.
- 5) IDWR agreed to review the reading input files from the ESPAM1.1 Curtailment Scenario and add to the analysis of differences in input data presented in the draft report comparing ESPAM2.0 with ESPAM1.1.
- 6) IDWR agreed to show the change in T and S_y between ESPAM1.1 and ESPAM2 on a map in the comparison report.
- 7) IDWR agreed to circulate language for the committee to consider regarding the completion of ESPAM version 2 and an endorsement for its use.
- 8) The committee agreed that the next meeting should be September 12th, 2012.