MEMORANDUM

To: ESHMC
Fr: Bryce Contor
Date: 7 March 2008

Re: Review of topics discussed at ESHMC

This is a review of the topics discussed by Bryce Contor at the 6 March 2008 ESHMC meeting in Boise.

Stress Periods

We generally agreed:

1. Stress periods will be one month long (this was decided a number of meetings ago).
2. Months will be defined by the actual number of calendar days (i.e February 2008 will be 29 days, March 2008 will be 31 days, etc).
3. IWRRI will gather all data up to the most recent available. As calibration starts, the end of the calibration period will be defined by an end date that allows us to use "nearly all real data, as recent as possible." This means that for a few components of the water budget, IWRRI may end up synthesizing or estimating values for some of the later stress periods, but this will not be done for a large number of components, for a long period of time, or for any major part of the water budget such as diversions or precipitation.

Evapotranspiration

During Rick Allen's presentation, we discussed the fact that the ESPAM1.1 data set relied upon a circa 2002 version of the Allen-Robison ET estimates. Dr. Allen indicated that the current Allen-Robison estimates are probably enough better that for years in the ESPAM2 calibration for which remote-sensing estimates are not used, we should use the current Allen-Robison estimates. IWRRI plans to follow this recommendation.

Recharge on Non-irrigated Lands

We generally agreed:

1. Use the "Fixed Points" capability of the recharge tools for minor land covers (wetlands, urban/industrial, etc.) instead of the NIR rasters. This

has two purposes; it simplifies the processing of the rasters, and it allows the wetlands data to be completely within a single data set (the Fixed Points data). In ESPAM1.1 the wetlands were represented both in the rasters and in the Fixed Points, due to a required adjustment. We will use the revised Allen-Robison estimates for wetlands and open water, and the ESPAM1.1 estimates for urban and industrial areas. We will no longer represent dry farms as a separate category, but use the "thick soil" major land cover.

2. Modify the recharge tool to allow 9 (vs. the current 4) multipliers. These will be applied to the three major land cover types (lava rock, thin soil and thick soil) in three general geographic regions (northeast, central and southwest).
3. Maintain the current processing paradigm where a single raster of non-irrigated recharge is handed to the recharge tools for each stress period, and adjustment within the PEST/Recharge loop (if desired) is accomplished using multipliers, with a limit of (recharge <= precipitation).
4. Revised Allen-Robison estimates will be used for the major land cover types. IWRRI will work with Dr. Allen to select the most applicable Allen-Robison cover for lava rock, thin soil and thick soil regions. The general arrangement is as follows:
    a. Dr. Allen will extend the period covered to include more recent weather data. Dr. Allen will explore adjusting for wind-induced under-catching of precipitation at weather stations.
    b. By early winter (i.e. November or December 2008) Dr. Allen will deliver a time series of precipitation and precipitation stored in the root zone for the non-irrigated land cover types in the current data, for the NOAA and AGRIMET stations within the ESPA model area.
    c. IWRRI will spatially interpolate (Precipitation – Precipitation stored in the root zone) as a proxy for recharge from precipitation, and prepare these data as monthly rasters for input into the Recharge Tools.

    Note that this arrangement will preclude delivery of non-irrigated recharge rasters by July 2008.

Recharge from Canal Leakage

We did not show the slides nor discuss recharge from canal leakage. However, the slides are fairly self explanatory and are posted on the IDWR ftp site. The following points would have been raised in discussion:

1. The recharge tools already incorporate the ability to scale canal recharge, by individual canal. More than one canal can be represented in a given entity.

2. Slide 6 shows that a generic semi-log relationship (Monthly seepage fraction = 0.3 – 0.1 (ln (Div Index)), where Div Index = (monthly diversions/maximum diversions).
3. Slide 7 shows that losses from the canals are generally higher in early months of diversion (red-colored symbols) and lower in later months (blue-colored symbols).
4. Slide 8 reminds us of our January 2008 discussion that we are not interested in *leakage* per se but *recharge due to leakage.*
5. Slide 9 points out three occurrences where leakage (calculated as *diversions – leakage – deliveries*) is negatives. All three were in the final month of an irrigation season, with very low diversions and deliveries. These may represent data errors but possibly represent the recovery of bank storage.
6. Slide 10 shows the result of applying the exist multiplier allowance for PEST adjustment to the one data set where the generic equation did not provide a good match. Note that in practice, since we have data for the Aberdeen-Springfield canal, we will not be using an algorithm for estimation of that entity.
7. Slide 10 presents my recommendation:
    a. Retain the current recharge-tool algorithm
    b. Represent all major canals as leaky (as recommended by the ESHMC in January 2008). IDWR is currently working on the GIS representation of the locations of canals.
    c. Use actual seepage rate data where available (i.e. Aberdeen-Springfield Canal Co.) and estimates elsewhere.

Please respond to these recommendations by e-mail to bcontor@if.uidaho.edu. Please also respond to the question posed in Slide 12: Do we use a fixed percentage of leakage (i.e. the same every month), or do we use the generic equation? I will compile and post the responses, and continue the discussion of canal leakage in writing.