**5.B DETAILED COMMENTS FOR HSPF (Brian Bicknell)**

**HSPF Model Development:**

Representation of Springs to Improve HSPF Calibration

I recommend that this section include discussion of the calibration of spring flows that was done.

**Calibration Process:**

This section discusses the calibration period. I recommend including a discussion of the decision to calibrate with all available data instead of calibration with part of the data and validation/verification with the remaining data. Both approaches are acceptable, and this project with its utilization of many gauges that have partial records, would have been unnecessarily complicated if the gauges had to be subdivided into two parts.

Also, some reviewers have apparently recommended calibrating to individual years to improve recharge for just those years. That is not a good idea; HSPF should utilize all available data (time spans) in a single calibration so that the model more robustly simulates different hydrologic conditions. Calibration to short periods eliminates this advantage of calibration to a long period of record.

**Parameter Estimation with PEST:**

The discussion of PEST objective function should include more details about the weighting factors that were applied to various components. How sensitive is the model to these weights, and did you try to assign much heavier weights to any components to try to improve the agreement of percent bias and Nash-Sutcliffe coefficient? Also, since PEST calibration is relatively uncommon, I recommend more backup or description of the more obscure components in Table 13.

**Calibration Results:**

This section includes all calibration results, including the detailed appendices of statistics and graphics for all models. I recommend including description of the calibrated parameter sets and water balance summaries that I have described elsewhere, and refer to those data sets in the respective appendices.

I recommend brief discussion of the apparent reason(s) for poor calibration agreement for those gauges that are poorly calibrated.