

Republican River Compact Administration
Engineering Committee Report
August 15, 2007

Draft of August 9, 2007
Modified by JRW 8/10/2007

Assignments

At the 2006 annual meeting of the Republican River Compact Administration, the Commissioners assigned the Engineering Committee the following tasks:

1. Complete the Republican River Compact Administration Accounting Procedures Guide and provide a resolution for its adoption.
2. Complete the accounting for 2006 using the preliminary information provided by April 15, 2007 and the final exchange by July 15, 2007.
3. Continue to work to resolve different recharge and return flow methods.
4. By November 15, 2006, develop a resolution regarding the Harlan County Lake evaporation split when only one state takes a release.
5. Add documentation requirements of acreage retirement to the user's manual.
6. Retain Principia Mathematica to perform maintenance of the groundwater model.

Comment [JW1]: Let's use the working title here instead of the description.

Deleted: The Engineering Committee assignments recommended in the report are:

Deleted: user's manual for accounting procedures

don't recall this as an assignment

Work activities related to these assignments

The Engineering Committee and technical representatives from the States of Colorado, Kansas, and Nebraska participated in numerous collaborative work activities and phone conferences as well as a face-to-face meeting on July 31, 2007. The following assignments and work activities were completed:

1. **Complete the user's manual for accounting procedures and provide a resolution for its adoption** - An initial draft of the users' manual was developed by Kansas' committee representatives in 2005. The draft consists of chapters on: 1) data sources, 2) data processing including the spreadsheets used by the committee, and 3) accounting results. As the committee envisions it, the user's manual will not repeat the accounting procedures nor the content of the groundwater model documentation which includes procedures used by each state to assemble its data for the groundwater model.

The accounting spreadsheet includes an input page which is a listing of all the data used in the subsequent computations. Each input cell is the responsibility of one of the states, with the state of Nebraska compiling much of the federal data. The Engineering Committee representatives agreed that each state will develop documentation for each cell that it is responsible for where the data is obtained and how the data is processed prior to input into the spreadsheet.

The assignment was not completed. Each state developed an outline of its data which was shared with the other states. The assignment should be continued next year.

- Shuhai - has he been asked to provide any documentation he has done?

- don't recall this is the way it was described

2. Complete the accounting for 2006 using the preliminary information provided by April 15, 2007 and the final exchange by July 15, 2007.

- a. As per the settlement's requirements, each state exchanged its model data sets and supporting data and other accounting by April 15 or shortly thereafter. A preliminary run of the RRCA groundwater model was developed by Willem Schreuder and posted on the RRCA web site he maintains for the Administration.
- b. The states exchanged final model data sets and supporting data by July 15 or shortly thereafter and Willem completed a "final" run after all the states' final data was delivered to him. On August 9, Colorado reported that it had discovered a minor error in its data and as a result, Willem did an updated run which is considered final by the Engineering Committee. Willem posted the updated run on the RRCA web site and has created CD's of this final run for each of the States.
- c. Nebraska reported that in 2006 its computations relied on meter data within the Republican Basin collected by the four primary Republican River basin Natural Resources Districts. Power record data was used only outside of the Republican River Basin boundary. New methods had to be employed to use the power records where part of the power service area was estimated using meter data and part using power data. Nebraska has documented its new procedures to the committee.
- d. Final data sets were collected by the Committee for streamflow, climatological information, diversion records, and reservoir evaporation records of the three states and in cooperation with the U.S. Geological Survey, U.S. Bureau of Reclamation, and U.S. Army Corps of Engineers for 2006.
- e. RRCA accounting spreadsheet – last year the committee refined the spreadsheet with respect to the multi-year compliance tests. One correction was made this year as it was found that the spreadsheet was not set up to allow Kansas to use 51.1% of any unused portion of Colorado's Allocation as per Settlement Stipulation.
- f. The 2006 accounting of the virgin water supply, the computed water supply, and the beneficial consumptive uses in the Republican River Basin were completed, including the ground water impacts computed by the RRCA Ground Water Model in conformance with the procedures described in the RRCA Ground Water Model Users Manual and is considered final except for the following matters:
 - i. Non-federal reservoir evaporation below Harlan County Lake. Nebraska believes the Final Settlement Stipulation prescribes that only non-federal reservoir evaporation above Harlan County should be included in the annual accounting. Kansas disagrees and believes it should be included for the entire basin. At last year's annual meeting the matter was referred to a legal committee created to resolve the issue. The matter is still unresolved. The Engineering Committee completed the computations under both interpretations, which are attached.
 - ii. Division of Evaporative Loss from Harlan County Lake when only one state utilizes reservoir storage for irrigation. Kansas believes that the FSS and currently approved accounting procedures did not anticipate this

not true!

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Shuhai should review this too. Also, has anyone in NE read the stip. regarding this point?

Not to Nebraska's satisfaction

condition and therefore do not clearly provide for a solution. Nebraska believes that this situation is adequately covered in the current accounting procedures. Last year the Administration asked the Engineering Committee to seek a solution prior to November 15, 2006. See discussion of this assignment below. As the Committee was not able to reach consensus, nor has any resolution been found, the Engineering Committee has completed the computations under both a Kansas preferred interpretation and a Nebraska preferred interpretation.

3. **Continue to work to resolve different recharge and return flow methods** – Kansas continues to believe that with the limitations placed on irrigation diversions in Nebraska, continued use of an irrigation efficiency of 80% applied to all diversions in Nebraska results in an inaccurate irrigation recharge value. Kansas does not believe detailed field investigations are warranted or needed. While the Engineering Committee had discussion on this matter, little effort was given to the assignment. The Engineering Committee further recommends continuing this assignment.

4. **By November 15, 2006, develop a resolution regarding the Harlan County Lake evaporation split when only one state takes a release.** – Kansas offered a proposal by the November 15, 2006 deadline set by the administration. The Kansas proposal is as follows: the AP's Section IV.A.2.e.1 should be amended as follows:

The total annual net evaporation (Acre-feet) will be charged to Kansas and Nebraska in proportion to the annual diversions made by the Kansas Bostwick Irrigation District and the Nebraska Bostwick Irrigation District during the time period each year when irrigation releases are being made from Harlan County Lake. For any year in which no irrigation releases were made from Harlan County Lake, the annual net evaporation charged to Kansas and Nebraska will be based on the average of the above calculation for the most recent three years in which irrigation releases from Harlan County Lake were made to both Districts.

For any year in which irrigation releases from Harlan County Lake were being made on behalf of only one of the Bostwick Districts, the net evaporation will be charged as follows:

- *Evaporation from Harlan County Reservoir will be divided between the pool below the annual shut-off elevation, and the pool above said elevation based on the volume of water stored in each pool.*
- *Evaporation from the pool below the annual shut-off elevation will be charged 51.1% to Kansas and 48.9% to Nebraska.*
- *Evaporation from water stored above the annual shut-off elevation will be divided between the States in proportion to the annual diversions made by the Kansas Bostwick Irrigation District and the Nebraska Bostwick Irrigation District during the time period that year when irrigation releases are being made from Harlan County Lake.*

Where's the discussion of the error in the GW Model output computations? Nebraska does not equate higher values with accuracy.

- The bottom pool would never have evap. if not exposed. As long as KS accepts that reality, NE could consider this proposal.

In the event Nebraska chooses to substitute supply for the Superior Canal from Nebraska's allocation below Guide Rock in Water-Short Year Administration years, the amount of the substitute supply will be included in the calculation of the split as if it had been diverted to the Superior Canal at Guide Rock.

Is this new or old
It is not fair to
NE either way.

Nebraska has not formally responded to this proposal but indicated that the current procedures could be interpreted to require Kansas to pay all the evaporation in years when it is the only state taking water. Kansas provided Nebraska with an outline of its rationale for believing that both states much share evaporation from Harlan County. So the Committee is not yet in agreement. As is noted above, accountings were developed for each interpretation.

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- 5. **Add documentation requirements of acreage retirement to the user's manual.** Both Colorado and Nebraska reported significant reduction in irrigation acreage estimate via either field work or retirement of acreage associated with incentive-based programs. Kansas has also had some limited retirements using such programs. Nebraska and Kansas have provided documentation to the other states as either GIS coverage (preferred) or a listing of legal tracts. The Kansas and Nebraska data is provided in sufficient detail to provide an opportunity for any state to determine compliance. Colorado ... This data should be exchanged annually and the requirement should be added to the accounting procedures.

Comment [JW2]:

- 6. **Retain Principia Mathematica to perform maintenance of the groundwater model.** Each state separately contracted with Principia Mathematica for the groundwater model services.

I strongly disagree.
We are only required to estimate CBCU.
Idle or dryland acres
Do NOT enter into this arena.

Other discussions:

On June 20, 2007, Nebraska provided the Engineering Committee with a proposed change in the accounting procedures and attached paper providing rationale for the proposed change. Nebraska believes that the current method of model runs properly calculates the mound credit but improperly includes in its consumptive use computation some consumption of the mound imports. Subsequent discussions were held seeking to clarify the proposal. Kansas and Colorado have requested model runs using the same data sets as the current accounting procedures prescribe so the proposal can be fully evaluated. While some outputs were provided, the input sets and model runs have not been provided for review by the States.

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We need to beef this section up considerably.

Recommended assignments for the coming year

The Engineering Committee recommends the Republican River Compact Administration assign the following tasks to be completed by the indicated dates:

- 1. Finalize work on a user's manual for the RRCA Accounting Procedures and provide a recommendation to the Administration for adoption at next year's annual meeting.

It's beyond the scope of the Engineering Com at this point.

2. Exchange by April 15, 2008 the information listed in Section V of the Accounting Procedures and Reporting Requirements, all data required by the Republican River Compact accounting procedure, and use these data to complete the preliminary accounting of the virgin water supply, the computed water supply, and the beneficial consumptive uses in the Basin for the calendar year 2007. By July 15, 2008 exchange any updates to this data to complete the final accounting of the virgin water supply, the computed water supply, and the beneficial consumptive uses in the Basin for the calendar year 2007.
3. Continue efforts to resolve concerns related to varying methods of estimating ground and surface water irrigation recharge and return flows within the Republican River Basin and related issues.
4. Amend the accounting procedures to include requirements for documenting irrigated acreage retirements.
5. Retain Principia Mathematica to perform on-going maintenance of the ground water and periodic updates requested by members of the Engineering Committee for calendar year 2007. The billable costs shall be limited to actual costs incurred, not to exceed \$12,000.00 in total and will be apportioned in equal 1/3 amounts to the States of Colorado, Kansas, and Nebraska respectively.

NO !!!

6. Review Kansas's proposed accounting change to bring the Water Short Year Administration accounting procedures into compliance with the Final Settlement Stipulation.

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7. Continue to review Nebraska's proposed calculation for the consumptive use of ground water.

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8. Discuss the erroneous inclusion of out of basin CUC as CBCU in the accounting.

The Engineering Committee requests the Administration to determine steps to resolve accounting disputes related to non-federal reservoir evaporation below Harlan County and the split in Harlan County evaporation when only one states takes water.

The Engineering Committee Report and final accounting spreadsheet will be posted on the web at www.republicanrivercompact.org.

Attachments:

Two sets of the following, one with Kansas interpretation on non-federal reservoir evaporation below Harlan County and the Harlan County reservoir evaporation split and the other with Nebraska's interpretation:

- Table 1, Accounting spreadsheet
- Table 3A, 3B, 3C, Accounting spreadsheet
- Table 5B, 5C, 5E, Accounting spreadsheet

*} Is this enough?
Should we acquiesce to this at all?
There are risks to NE interests in going that far without resolution to all the aforementioned issues.*

David W. Barfield
Engineer Committee Member for Kansas

Megan Sullivan
Engineer Committee Member for Colorado

Jim Williams
Engineer Committee Member for Nebraska

Attachments: