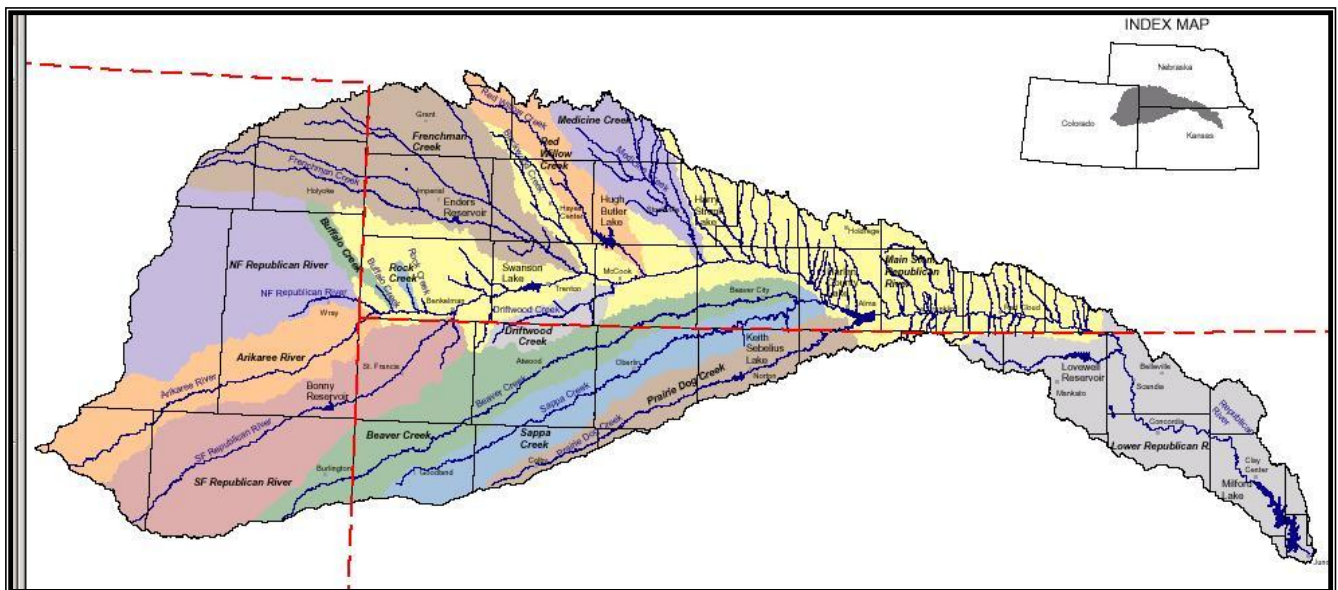


REPUBLICAN RIVER COMPACT ADMINISTRATION

55th ANNUAL REPORT

FOR THE YEAR 2015



BURLINGTON, COLORADO

AUGUST 24, 2016

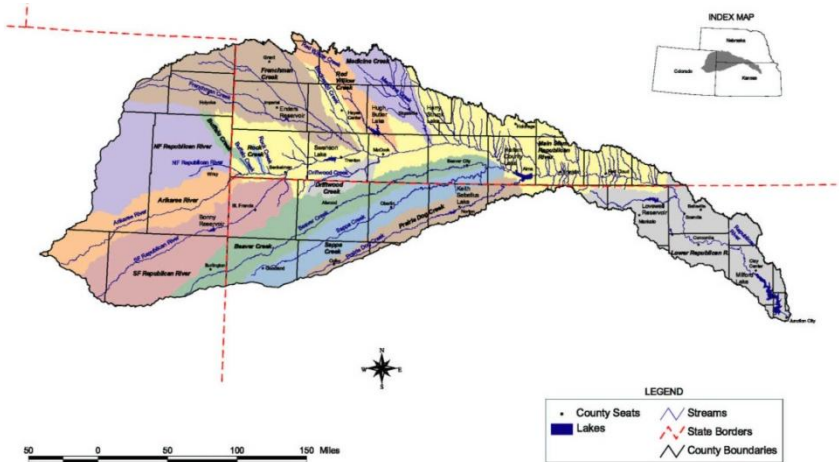
55th Annual Report for the Year 2015 | 2016 Annual meeting

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REPUBLICAN RIVER COMPACT ADMINISTRATION

Special Meeting
November 24, 2015



SUMMARY AND MINUTES OF
THE SPECIAL MEETING OF THE
REPUBLICAN RIVER COMPACT
ADMINISTRATION

November 24, 2015, 1:00 PM (CST)

VIA CONFERENCE CALL

Summary & Minutes

A transcript of this meeting was prepared by Linda W. Rohman of General Reporting Service. (Exhibit A). The transcript was reviewed by each of the States and, upon final approval by the Compact Administration; this transcript will serve as the official minutes of this Special Meeting of the Compact Administration. Below is a summary of the meeting.

Agenda Item 1: Introductions

The Special Meeting of the Republican River Compact Administration (RRCA) was called to order by Colorado Chairperson Dick Wolfe at 1:00 p.m. CST on November 24, 2015. Chairperson Wolfe introduced those present at the Colorado listening location and asked the other two states to do the same. A complete list of those attendees is attached as Exhibit B. Some of the attendees included:

<u>Name</u>	<u>Representing</u>
Dick Wolfe	Colorado Commissioner and Chairperson
Gordon W. Fassett	Nebraska Commissioner
David Barfield	Kansas Commissioner
Ivan Franco	Colorado Engineering Committee Chairperson
Chris Beightel	Kansas Engineering Committee Member
Jesse Bradley	Nebraska Engineering Committee Member

Agenda Item 2: Modifications & Adoption of the Agenda

Chairperson Wolfe introduced adoption of the agenda. It was adopted by unanimous consent. A copy of the agenda is attached as Exhibit C. Chairperson Wolfe noted that all three States had agreed to waive the typical notice requirement for meetings of the RRCA by email.

Agenda Item 3 (a): Proposed amendments to the Resolution Approving Accounting Adjustments and Agreements Related to the Operation of Harlan County Lake for Compact Year 2016 dated August 27, 2015.

Commissioner Fassett started by providing an introduction to agenda action item 3a, noting this agenda item was the result of an ongoing process between Nebraska and Kansas, and other relevant entities to ensure the August 27, 2015 resolution can be implemented as the States

intended. The proposed changes to the agreement would provide Nebraska additional alternative strategies or authorizations to maintain the current obligation in the event the memorandum of agreement (MOA) approach being pursued was satisfactorily completed.

Commissioner Fassett stepped through the changes, noting that the primary change was under item number 7 which would allow Nebraska to use its administrative authorities to effectuate the resolution (Exhibit D). He ultimately went on to summarize that Nebraska was asking for approval of the amendment of the resolution.

Commissioner Barfield stated that while Kansas is in support of the resolution, we remain hopeful that an agreement on a satisfactory MOA to effectuate the resolution could be reached. He also noted that Kansas had suggested the modification to item 1(c) as Kansas is not yet in a position to use this option.

After Commissioner Barfield moved the adoption of the Amended Resolution Approving Accounting Adjustments and Agreements Related to the Operation of Harlan County Lake for Compact Year 2016, dated November 24th, 2015, and a second by Commissioner Fassett, the motion passed unanimously.

Agenda Item 4: Adjournment

Upon adoption of the resolution, the commissioners agreed that this action had concluded the meeting and the meeting was adjourned.

The meeting adjourned at 1:16 p.m.

The November 24th, 2015, Special Meeting report is hereby approved by unanimous vote of the RRCA on this 21st day of August, 2018.

As indicated by their signature and date below, the RRCA Commissioners agree that the report was approved by RRCA on the date indicated above.

Kevin H. Rein DATE SIGNED: 8-21-18
Kevin Rein, Chairperson and Colorado Commissioner

Gordon W. Fasset DATE SIGNED: 8/21/18
Gordon W. "Jeff" Fasset, Nebraska Commissioner

David W. Barfield DATE SIGNED: 8/21/2018
David Barfield, Kansas Commissioner

Exhibits

- Exhibit A: Transcript of the November 24, 2015, Special Meeting
- Exhibit B: Attendance of the November 24, 2015, Special Meeting
- Exhibit C: Agenda for the November 24, Special Meeting
- Exhibit D: Amended Resolution Approving Accounting Adjustments and Agreements Related to the Operation of Harlan County Lake for Compact Year 2016 - Dated November 24, 2015.

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SPECIAL MEETING OF THE
REPUBLICAN RIVER COMPACT ADMINISTRATION

November 24, 2015
1:00 p.m. Central Time
Flatwater Group, Inc.
8200 Cody Drive, Suite A
Lincoln, Nebraska

MEMBERS PRESENT

- FOR NEBRASKA: Commissioner Gordon W. "Jeff" Fassett, Chair
Jesse Bradley
Justin Lavene
- FOR COLORADO: Commissioner Dick Wolfe (via conference call)
Ivan Franco (via conference call)
Scott Steinbrecher (via conference call)
Mike Sullivan (via conference call)
- FOR KANSAS: Commissioner David Barfield
Jackie McClaskey (via conference call)
Lane Letourneau
Chris Beightel
Earl Lewis
Tracy Streeter
Chelsea Erickson (via conference call)
Kenny Nelson
Pete Gile

RECEIVED
DEC 17 2015
DEPARTMENT OF
NATURAL RESOURCES

1 PROCEEDINGS:

2 CHAIRPERSON WOLFE: All right. If the recorder's
3 ready, I'll go ahead and call this meeting to order.

4 THE REPORTER: I'm ready.

5 CHAIRPERSON WOLFE: This is a -- all right. Good
6 afternoon, everyone. This is Dick Wolfe, State Engineer for
7 Colorado and, also, the Colorado Commissioner for the
8 Republican River Compact Administration and also the current
9 Chairman. I hereby call this November 24th, 2015, special
10 meeting of the Republican River Compact Administration to
11 order. Here with me, in accordance with the agenda, we have
12 for introductions Scott Steinbrecher is here with me as
13 well, who works for the Attorney General's Office for
14 Colorado; Ivan Franco, who's the engineer advisor for
15 Colorado; and Mike Sullivan, who's the Deputy State
16 Engineer.

17 And at this time, I'll turn it over to
18 Commissioner Fassett for those at your location, if you want
19 to do introductions.

20 COMMISSIONER FASSETT: There's quite a group here,
21 Mr. Chairman. With me on behalf of the State is Jesse
22 Bradley, members of our consulting team, and Justin Lavene
23 from the Attorney General's Office. We're actually
24 circulating a sign-up list so that we can capture all the
25 various folks from the States as well as visitors here from

1 a variety of the irrigation districts in the state as well.

2 David?

3 COMMISSIONER BARFIELD: Yes, Dave Barfield here,
4 Commissioner for Kansas. Yeah, as Mr. Fassett recognized,
5 there's quite a large group here today. With me is -- on
6 the phone is Jackie McClaskey, Secretary of Agriculture.
7 And with me is Tracy Streeter and Earl Lewis of the Kansas
8 Water Office; Lane Letourneau and Chris Beightel with the
9 Division of Water Resources at the Kansas Department of
10 Agriculture; and, on the phone, is Chelsea Erickson from our
11 Stockton Field Office. We have Kenny Nelson and Pete Gile
12 and his Board from the Kansas Bostwick Irrigation District.

13 CHAIRPERSON WOLFE: Thank you, Commissioners.

14 Is there anyone else that's joined by phone since
15 we've started the meeting?

16 (No response.)

17 Hearing none, we'll continue on through our
18 agenda. Are there any modifications to the agenda?

19 COMMISSIONER FASSETT: None from Nebraska.

20 COMMISSIONER BARFIELD: None from Kansas. I think
21 we might note for the record that all three States agreed to
22 waive the typical notice for these meetings so that we could
23 conduct this business today.

24 CHAIRPERSON: Yes, thank you, Commissioner
25 Barfield. That acceptance of waiver was done via e-mail

1 between the three commissioners, and is hereby recognized by
2 the Chair. And if there's no modifications to the agenda,
3 we'll adopt it by unanimous consent.

4 Next, we'll take up our only action item, 3a. And
5 at this time, I'd like to turn it over to Commissioner
6 Fassett to introduce action item 3a.

7 COMMISSIONER FASSETT: All right. Thank you, Mr.
8 Chairman.

9 What's before you today was brought by Nebraska.
10 As we've been working since we first entered this resolution
11 back in August of 2015, we've continued, each -- both Kansas
12 and Nebraska have been working as best we can with the
13 relevant entities and irrigation districts on the aspect of
14 our August resolution that was focused on the development of
15 an MOA, which would be prepared and executed in a manner
16 that would allow the resolution to be -- in conformance with
17 the resolution and allow the resolution to be implemented.
18 About a week or so ago, I think all of the commissioners
19 received an early draft of an MOA. That had been developed
20 and shared with the commissioners by Aaron Thompson from the
21 Bureau of Reclamation on the districts' behalf. We
22 understand that there is continuing dialogue and discussions
23 associated with that MOA, but the early look at that MOA
24 draft appeared to leave us in a position where, if executed,
25 it would not be consistent with the resolution that was

1 adopted in August.

2 As a result, we have proposed and sought input
3 from the member states at -- an amendment to our August 27th
4 resolution, which would allow -- maintain the obligation or
5 the option of pursuing the MOA approach, but would add some
6 additional alternative strategies or authorizations that the
7 State of Nebraska could use to, again, facilitate the
8 implementation of the resolution that we adopted.

9 And that's really what we have before us today, is
10 -- I can step through very briefly the changes that are
11 presented in the draft amended resolution. We did amend the
12 title itself, as before you, to reflect that this is yet
13 another step in the process. It is amending the resolution
14 of August 27th. We added a "whereas" to clarify that there
15 was that resolution and then the one that we're seeking
16 adoption of today.

17 There were two changes under provisions under 1(c)
18 and (d) that made specific reference to the water
19 accounting. We also removed a phrase in 1(c) associated
20 with other Kansas uses -- users, excuse me, -- that was in
21 the prior resolution.

22 But, perhaps, our primary purpose in presenting
23 this amendment today was under item number 7. We are
24 suggesting that the contingency that we adopted back in
25 August, which was written to seek an amendment to the MOA

1 that was between NBID and KBID that could be executed to
2 help us implement this resolution, in addition to that
3 option, we are seeking an amendment today that would allow
4 Nebraska to use our administrative authorities to effectuate
5 the resolution as well.

6 That's kind of a quick overview. Let me, perhaps,
7 let Mr. Bradley comment any further, if he wants to capture
8 anything that I didn't quite sort of characterize today.

9 Jesse?

10 MR. BRADLEY: No, I think that captures the nature
11 of the changes.

12 COMMISSIONER FASSETT: So, again, we're -- the
13 thrust is to not detract from the resolution. We are open
14 and, hopefully, the negotiations will -- may indeed
15 continue. We are told they are continuing. But we felt it
16 was important and timely, as a result of the operations and
17 the flow situation in the river basin at this time, that we
18 give ourselves another alternative so that Nebraska can
19 honor the commitment we made in the resolution that was
20 adopted back in August. That's very important to us, and so
21 we're asking for this amendment to be approved, allowing
22 that option to be, again, another tool, if you will, to
23 allow this resolution to be implemented.

24 CHAIRPERSON WOLFE: Thank you, Commissioner
25 Fassett.

1 Commissioner Barfield, do you have any comments?

2 COMMISSIONER BARFIELD: Just a couple. Certainly,
3 we, you know, we've been discussing with the States this
4 change, and, as we'll hear in a moment, agree with it.
5 Again, I would also underscore Commissioner Fassett's
6 statement that, you know, we hope still to get to
7 effectuating the States' agreement through modification to
8 the MOA, if at all possible, but want to provide another way
9 to get there.

10 With respect to the change to item 1(c) that
11 Commissioner Fassett referenced, just we -- Kansas requested
12 that change. We certainly want to continue to explore in
13 our long-term discussions with respect to the resolution of
14 the issues and our working together as States. We want to
15 continue to explore the alternative or opportunity where, if
16 the water supply available to Kansas is beyond the needs of
17 Kansas Bostwick Irrigation District, a way to see if we can
18 meet some of our needs in Kansas. But with respect to this
19 resolution and the anticipated water supply in 2016, we just
20 don't see that that alternative needs to be part of this
21 resolution and have, therefore, asked to, just for the sake
22 of clarity, to drop that phrase.

23 CHAIRPERSON WOLFE: Thank you, Commissioner
24 Barfield.

25 Is there any other discussion to come before the

1 Commission this time regarding this action item?

2 (No response.)

3 Hearing none, at this time, I would entertain a
4 motion to approve a resolution of the Republican River
5 Compact Administration titled: Amended Resolution Approving
6 Accounting Adjustments and Agreements Related to the
7 Operation of Harlan County Lake for Compact Year 2016, dated
8 November 24th, 2015.

9 COMMISSIONER BARFIELD: This is Commissioner
10 Barfield. I would so move.

11 COMMISSIONER FASSETT: This is Commissioner
12 Fassett. I would second.

13 CHAIRPERSON WOLFE: Okay. There's been a motion
14 and a second. Any further discussion on the motion?

15 (No response.)

16 Hearing none, we'll take a roll call. All those
17 in favor, say "aye."

18 COMMISSIONER BARFIELD: Aye.

19 COMMISSIONER FASSETT: Aye.

20 CHAIRPERSON WOLFE: Aye.

21 Any opposed, "nay."

22 (No response.)

23 Motion carries.

24 That's all we have before us as far as action
25 items. If there are no objections at this time in regards

1 to adjournment, I'll consider this special meeting closed.

2 COMMISSIONER BARFIELD: That's fine. Thank you.

3 COMMISSIONER FASSETT: Yeah, no objection. Thank
4 you, Mr. Chairman.

5 CHAIRPERSON WOLFE: Thank you.

6 (Whereupon, at 1:16 p.m. on November 24, 2015, the
7 special meeting was concluded.)

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**SPECIAL MEETING OF THE
REPUBLICAN RIVER COMPACT ADMINISTRATION**

November 24, 2015

Attendance by Location

Name	Representing
Denver, Colorado	
Dick Wolfe	Colorado Commissioner and Chairperson
Scott Steinbrecher	Colorado Attorney General's Office
Ivan Franco	Colorado Division of Water Resources
Mike Sullivan	Colorado Deputy State Engineer
Lincoln, Nebraska	
Jeff F. Fassett	Nebraska Commissioner
Jesse Bradley	Nebraska Department of Natural Resources
Justin Lavene	Nebraska Attorney General's Office
Tom Riley	Flatwater Group
Lane Letourneau	Kansas Water Appropriation Program
Chris Beightel	Kansas Division of Water Resources
Earl Lewis	Kansas Water Office
Chance Thayer	Flatwater Group
David Kracman	Flatwater Group
Tracy Streeter	Kansas Water Office
David Barfield	Kansas Commissioner
Jasper Fanning	Upper Republican NRD, Nebraska
Robert Merrigan	Middle Republican NRD, Nebraska
Scott Dicke	Lower Republican NRD, Nebraska
Steve Henry	Frenchman Cambridge Irrigation District
Brad Edgerton	Frenchman Cambridge Irrigation District
Tracy Smith	Bostwick Irrigation District Nebraska
Mike Delka	Bostwick Irrigation District Nebraska
Aaron Thompson	Bureau of Reclamation
Kenny Nelson	Kansas Bostwick Irrigation District
Pete Gile	Kansas Bostwick Irrigation District
Remote Location by Phone	
Jackie McClaskey	Kansas Secretary of Agriculture
Chelsea Erickson	Kansas Division of Water Resources

REPUBLICAN RIVER COMPACT ADMINISTRATION
(RRCA) SPECIAL MEETING 24 Nov 2015

Name	Entity
Jesse Brulley	NWR
Jeff Fawcett	NWR
Tom Riley	TFG
LANE LETOURNEAU	KDA
CHRIS BEIGHTER	KDA
Earl Lewis	KWO
Chance Thayer	TFG
David Kraeman	TFG
Tracy Strubbs	KS WATER OFFICE
David Banfield	KS DWR/RRCC
Sasper Fanning	WRNRD-NE
Robert Merrigan	MRNRD-NE
SCOTT DICKE	WRNRD-NE
Steve Henry	FCID
Brad Edgerton	FCID
TRACY SMITH	Bastwick ID in NE
MIKE DELKA	" " "
Aaron Thompson	Reclamation
Kenny Nelson	Ks. Bastwick Irr. Dist
Moss Dick	KBID
Gay Zoull	KBID
and "Pete" Gile	KBID

Republican River Compact Administration – Special Meeting Attendance Sheet
 November 24, 2015

Location Denver, CO

Name – Please print legibly	Affiliation/Group
Dick wolfe	CDWR
Mike Sullivan	CDWR
Liam Francis	CDWR
Scott Sheinbrecher	Colorado Attorney Generals office

AGENDA FOR
**SPECIAL MEETING OF THE
REPUBLICAN RIVER COMPACT ADMINISTRATION**
November 24, 2015, 1:00 PM Central Time

The Flatwater Group, Inc.
8200 Cody Dr. Suite A
Lincoln, NE 68512
And via Conference Call
(Phone Number: 1-888-820-1398; Passcode: 1363142#)

1. Introductions
2. Modification and Adoption of the Agenda
3. Action Item
 - a. Discuss proposed Amendment to the Resolution to Approved Accounting Adjustments Related to the Operation of Harlan County 2015.
4. Adjournment

RESOLUTION OF THE REPUBLICAN RIVER COMPACT ADMINISTRATION

AMENDED RESOLUTION APPROVING ACCOUNTING ADJUSTMENTS AND AGREEMENTS RELATED TO THE OPERATION OF HARLAN COUNTY LAKE FOR COMPACT YEAR 2016

November 24, 2015

Whereas, the States of Kansas, Nebraska, and Colorado entered into a Final Settlement Stipulation (“FSS”) as of December 15, 2002, to resolve pending litigation in the United States Supreme Court regarding the Republican River Compact (“Compact”) in the case of *Kansas v. Nebraska and Colorado*, No. 126 Original;

Whereas, the FSS was approved by the United States Supreme Court on May 19, 2003;

Whereas, the States, in consultation with the United States, previously determined that the Compact may be administered in a manner that increases flexibility for all water users, while remaining consistent with the terms of the Compact and the FSS; and

Whereas, the RRCA desires to establish an agreement to guide them through April 1, 2017, while they continue to develop long-term modifications to reservoir operations and the RRCA Accounting Procedures.

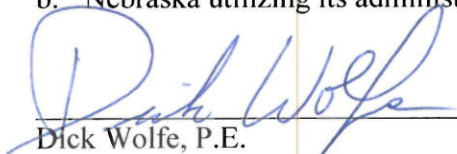
Whereas, the RRCA previously adopted a resolution on August 27, 2015 titled “Resolution Approving Accounting Adjustments and Agreements Related to the Operation of Harlan County Lake for Compact Year 2016.

NOW THEREFORE BE IT RESOLVED:

Provisions:

- 1) For purposes of this Resolution only, the following definitions shall apply:
 - a. *Compact Call Forecast Volume* means the amount of water that is identified through application of the signing of this agreement forecasting methodology established in Nebraska’s Republican River Basin Integrated Management Plans.
 - b. *Compact Compliance Volume* means the amount of augmentation water supplied by the Rock Creek and/or N-CORPE projects, which is required for Nebraska’s Compact compliance, as determined on December 31, 2016.
 - c. *Kansas Account* means the water made available in Harlan County Lake exclusively for use by KBID.
 - d. *June 1 Irrigation supply for Kansas* means all water in the Kansas Account exclusive of any water carried forward pursuant to Warren Act contract number 14WR630034.
- 2) Nebraska shall establish, pursuant to the Integrated Management Plans, the Compact Call Forecast Volume for 2016 no later than December 31, 2015.


- 3) Nebraska shall make good faith efforts to ensure that, no later than June 1, 2016, the June 1 irrigation supply for Kansas has not less than the lesser of 40,000 acre feet of water, or the Compact Call Forecast Volume combined with Kansas' share of inflows into HCL.
- 4) Nebraska shall evaluate actual hydrologic conditions on a regular basis to estimate the Compact Compliance Volume. Beginning April 10, 2016, Nebraska shall provide the results of this estimate to Kansas and Colorado and to the United States not later than the tenth day of each month. Nebraska shall provide to the other States the final Compact Compliance Volume on December 31, 2016.
- 5) In the event any action taken under Provision 3 fails to ensure the full Compact Compliance Volume reaches the Kansas Account by June 1, 2016, Nebraska shall ensure that the remainder is delivered to the Kansas Account no later than April 1, 2017 [separate and in addition to any obligation for 2017].
- 6) The accounting offset for Nebraska's 2016 compliance operations shall be recorded in the "Imported Water Supply Credit" and "Imported Water Supply Credit Above Guide Rock" columns of Nebraska's Table 3 and Table 5c respectively which, for the 2016 Compact Accounting for Nebraska, will be increased by the amount of augmentation water delivered into the Kansas Account pursuant to Provision 3 and 5. The 2016 and, as necessary, the 2015 and 2017 Virgin Water Supply of Rock Creek and Medicine Creek will be reduced by the amount of augmentation water supplied between October 1, 2015 and April 1, 2017 in the year pumped.
- 7) The foregoing is contingent upon one or more of the following actions being taken to effectuate this agreement:
 - a. Successful execution, of an amendment to the MOA between NBID and KBID allocating project water in a manner that effectuates this Agreement; or
 - b. Nebraska utilizing its administrative authorities to effectuate this agreement.



Dick Wolfe, P.E.
Colorado Commissioner
Chairman, RRCA

12/10/15

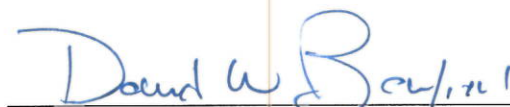
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Gordon W. Fassett, P.E.
Nebraska Commissioner

11/24/15

date



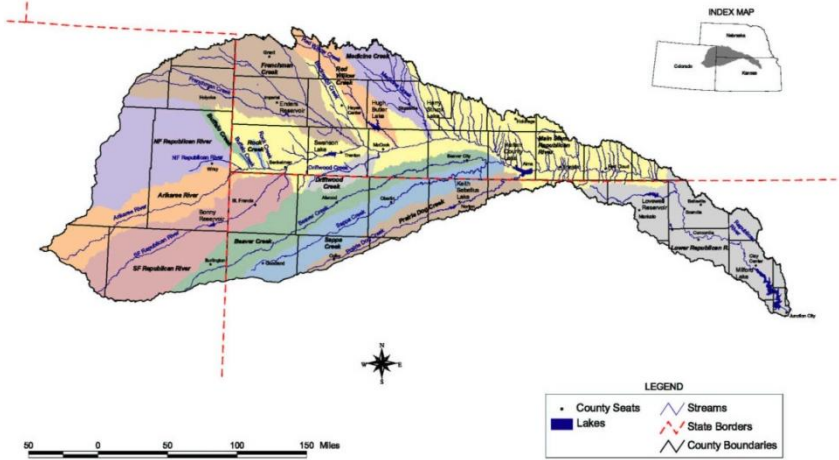
David W. Barfield, P.E.
Kansas Commissioner

11/24/2015

date

REPUBLICAN RIVER COMPACT ADMINISTRATION

Annual Meeting
August 24, 2016



SUMMARY AND MINUTES OF
THE 2016 ANNUAL MEETING OF
THE REPUBLICAN RIVER
COMPACT ADMINISTRATION

AUGUST 24, 2016

HELD AT THE
BURLINGTON COMMUNITY
CENTER
BURLINGTON, COLORADO

Summary & Minutes

A transcript of this meeting was prepared by Denise Freeman of Patterson Reporting Service (Exhibit A). The transcript was reviewed by each of the States, and upon final approval by the Compact Administration, the transcript will serve as the official minutes of this Annual Meeting of the Compact Administration. Below is a summary of the meeting.

Agenda Item 1: Introductions

The Annual Meeting of the Republican River Compact Administration (RRCA) was called to order by Colorado Commissioner and Chairman Dick Wolfe at 1:30 p.m., August 24, 2016. Commissioner Wolfe asked for introductions around the room. A complete list of attendees is attached as Exhibit B. Some of the attendees included:

<u>Name</u>	<u>Representing</u>
Gordon W. "Jeff" Fassett	Nebraska Commissioner
Jennifer Schellpeper	Nebraska Engineering Committee Member
Justin Lavene	Nebraska Attorney General's Office
Dick Wolfe	Colorado Commissioner and Chairman
Ivan Franco	Colorado Engineering Committee Member and Chairman
Scott Steinbrecher	Colorado Attorney General's Office
David Barfield	Kansas Commissioner
Chris Beightel	Kansas Engineering Committee Member

Agenda Item 2: Adoption of the Agenda

Commissioner Wolfe introduced the agenda and noted that under agenda item 8 (c), the commissioners would actually be taking three separate actions. Commissioner Barfield noted that there was an additional item under Old Business added concerning the status of reports and transcripts. An additional change was made to the title of agenda item 8 (d). Commissioner Barfield then moved to adopt the final agenda as agreed upon, and the motion was seconded by

Commissioner Fassett and the agenda was unanimously approved. A copy of the final agenda is attached as Exhibit C.

Agenda Item 3: Status of Report and Transcripts for 2015 Annual Meeting and Prior Special Meetings

Jennifer Schellpeper reported that there were four meetings in total that would be part of the 2015 annual report. Of those, two of the meeting materials have been fully circulated amongst the states and returned and two of those were still being worked on.

Agenda Item 4: Report of Chairman and Commissioners' Reports

- a. Kansas: Commissioner Barfield first described some Kansas intrastate issues, then highlighted some interstate progress:
 - i. Commissioner Barfield recognized and appreciated the attendance of two Northwest Kansas legislators, Senator Ostmeyer and Representative Billinger, who were present for the meeting.
 - ii. Starting in 2013, the Kansas Governor challenged state agencies and local stakeholder to get involved in shaping the Kansas 50-year Water Vision, which continues to inform Kansas's decision making. Recent efforts are focused with regional advisory committees to determine how to implement the plan's broad vision at a local level.
 - iii. Commissioner Barfield gave an update on Kansas water-related legislative activities. . One bill was passed requiring the Division to perform additional notices and postings of its permit actions on the website. The goal is to allow for more transparency in terms of the Division's activities and how they affect water users.
 - iv. A second bill from last year allow for development of Water Conservation Areas to allow for a more flexible operation of water rights when they are facilitating reductions in water use in some of our areas. The state has been active in terms of promoting this tool and working with water users who want to reduce their total use.
 - v. Groundwater Management District 4 (GMD4), in northwest Kansas, has the state's first Local Enhanced Management Area (LEMA) in Sheridan County, which is in its fourth year. The District Board is actively exploring the idea of a district-wide Local Enhanced Management Area.
- b. Colorado:
 - i. Commissioner Wolfe gave a brief overview of the Colorado Compact Compliance Pipeline's history, noting that the pipeline has been operating under, essentially, annual approvals since 2014. The three states have continued to meet in hopes of hashing out a long-term agreement. As part of these discussions, Colorado recognized the need to update the Well Measurement Rules to incorporate areas previously excluded, along with other updates. These rules have now been updated as of September.

- ii. Commissioner Wolfe highlighted the fact that as of June 2016, he had established a 41-member advisory committee to assist in developing compact compliance rules. These rules are the last chapter in their compliance efforts and will basically indicate that folks need to participate in some type of plan or compliance effort to help them in achieving compact compliance. There have been two meetings to date regarding these rules with more planned.
 - iii. Commissioner Wolfe reported that Colorado was successful in getting the FSA to increase the CREP rental rate to \$180 dollars per acre. This is of great benefit to the state as Colorado has a significant number of acres brought in through these voluntary efforts and will continue to do that going forward.
- c. Nebraska:
- i. Commissioner Fassett stated that Nebraska continues to be in compliance and has made great efforts to fulfill their obligations to Kansas and their water users in the downstream area. During the past year or so, both the Rock Creek and N-CORPE stream flow augmentation projects have been continuing to operate periodically. Nebraska has many temporary leasing arrangements, such as CREP, that continue to make strides in reducing water use in the state.
 - ii. Commissioner Fassett touched on a feasibility study that is in the early stages to investigate a potential new augmentation project. If the study returns positive results, more information will be disseminated. Commissioner Fassett reported on the status of the Water Sustainability Fund that was created in 2014. He noted that a 27-member body went through a very detailed process to rank applications for funding support from the state and then to award state dollars to the highest ranking projects that are worth of investment. There were 17 projects approved this past April for about 11 million dollars and there are another 33 new applications for water resources projects this next round.
 - iii. Commissioner Fassett quickly discussed the statewide water basin planning process currently underway in Nebraska. There is a group of 50 to 60 stakeholders that are beginning to wrestle with very difficult issues with regards to what they want to recommend from a basin-wide standpoint.
 - iv. Jennifer Schellpeper gave highlights from Nebraska's water administration report for 2015. In January of 2015, NeDNR did notify the holders of irrigation and storage permits that it would be a compact call year, so that was in effect for 2015 in Nebraska. Then, NeDNR had a number of closing notices, more than 130, that were issued in the first week of July, and most of those folks are then coming back open again in September of 2015.

Agenda Item 5: Federal Reports

- a. Bureau of Reclamation: Craig Scott distributed the Bureau's summary report of its operations in the Republican River Basin for 2015 (Exhibit D) and reviewed some of the report's highlights. Mr. Scott mentioned the WaterSMART Republican River Basin Study which was completed in early 2016 and thanked the other states for their

collaborative efforts in completing the study. Mr. Scott noted that the Bureau would like to have an opportunity to give meaningful input on any future resolutions.

- b. U.S. Army Corps of Engineers: John Grothaus shared that progress is being made on the Corps' repairs at Harlan County Dam, noting that the contract was modified to add new irrigation intake trash racks and provide for repairs to one Naponee irrigation slide gate and one Franklin irrigation slide gate and two Franklin canal powerhouse sluice gates. Mr. Grothaus noted that the project was 49 percent complete and on schedule to be completed April 2018. A copy of the Corps PowerPoint is attached as Exhibit E.
- c. U.S. Geological Survey: John Miller distributed a report of annual mean discharge for each of the 13 gages the USGS operates for the Compact, as well as two Nebraska operates (Exhibit F). Mr. Miller noted that three new gages were added to the USGS charge this year and those are Beaver Creek near Beaver City, the Republican River near Guide Rock, and the Republican River near Benkelman. Mr. Miller discussed some highlights in the report, noting that the report covered the 2015 water year which is from October 1 to September 30. Six of the 15 sites were within the top 10 of the lowest annual mean discharge for the period of record. The year of 2015 was slightly wetter and cooler and improved overall flows through the basin. Mr. Miller touched on flow conditions for the year in some key drainages and noted that staffing was full in the North Platte Field Office, leading to quicker record completions.

Agenda Item #6: Engineering Committee Report

- a. Assignments from 2015 Annual Meeting: Ivan Franco shared the Engineering Committee (Committee) Report (Exhibit G). The Committee met four times in 2016, with three assignments being completed: (1) holding quarterly meetings, (2) exchanging information listed in Section 5 of the Accounting Procedures and Reporting Requirements, and (3) drafting a letter to the USGS to discuss finalized gage data by April 15 of each year. The Committee recommended continuing seven assignments from the previous year: (1) continued efforts to resolve concerns in the methods of estimating ground and surface water recharge and return flows, (2) continue working on finalizing accounting for 2006 through 2015, (3) working to resolve issues preventing agreement on final accounting for that time period, (4) discussing developing an application and approval process for future augmentation plans, (5) exploring options for sharing evaporation charges for Harlan County Lake, (6) assign responsibility for collecting specific fields of data collected for the annual data exchange, and (7) create a document memorializing when RRCA Accounting Procedures have changed over the years and incorporate it into the Accounting Procedures.

- b. Committee recommendations to RRCA: The EC recommends discussion by the RRCA on the exchange of data and documentation and the modeling runs completed by Principia Mathematica for 2015, discussion of Nebraska’s proposal to revise the RRCA Accounting Procedures and Reporting Requirements, and the recommended EC assignments for the following year.

- c. Recommended assignments for Engineering Committee: The Committee’s recommendations about assignments for the coming year are listed below. In addition to the assignments the Committee has recommended for continuation, which is described under “Assignments from 2015 Annual Meeting” above, the Committee also recommends some new assignments for the upcoming year and identifies some assignments from the previous year that the Committee does not recommend continuing.
 - 1. Meet quarterly to review the tasks assigned to the committee.
 - 2. Exchange by April 15, 2017, the information listed in Section V of the RRCA Accounting Procedures and Reporting Requirements, and other data required by that document, including all necessary documentation. By July 15, 2017, the states will exchange any updates to these data.
 - 3. When possible, 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. Continue efforts to finalize all accounting for years since 2006. Issues between the states currently include:
 - a. Kansas’s request for beginning and ending meter data from other states.
 - b. Agreement on appropriate Surface Water Inputs.
 - c. Reaching consensus on how to model Bonny Reservoir.
 - 5. Continue work to assign responsibility for collecting specific fields of data collected for the annual data exchange by determining who has the best available data and assigning them the responsibility of populating those fields in order to avoid confusion between multiple datasets.
 - 6. Continue work on creating a document memorializing when RRCA Accounting Procedures have changed over the years and incorporate it into the Accounting Procedures.
 - 7. When possible discuss developing an application and approval process for future augmentation plans.
 - 8. Continue to explore options for sharing evaporation charges for Harlan County Lake when accounts exist separate from the project water supplies of Bostwick Division and explore potential means to adjust the compact accounting of Harlan County Lake for the mutual benefit of the States.

9. Continue efforts to develop and publish an administrative website that would be an informational page for the general public.
10. By December 31, 2016 unify accounting procedures and reporting requirements approved by all RRCA resolutions including determining the appropriate model run or runs to be performed by Principia Mathematica.
11. Continue work and provide future update on improving accounting tools developed by the Engineering Committee.

Agenda Item #7: Old Business

- a. Status of unapproved previous accounting: Commissioner Wolfe noted that once the input data are finalized, the ability to approve previous accounting will depend on whether the issues preventing approval of final accounting have been resolved.
- b. Status of Report and Transcripts for 2014 Annual Meeting and prior Special Meetings: Commissioner Wolfe described the report and noted that it had been distributed. Commissioner Barfield moved that the 2014 Annual Report be approved. Commissioner Fassett seconded. The motion passed unanimously.

Agenda Item #8: New Business and Assignments to Compact Committees

- a. Three State Discussions: The three states discussed the significance of the actions that would be undertaken at this meeting.
- b. Action on Engineering Committee Report and assignments: Commissioner Barfield moved to approve the Engineering Committee report and associated assignments for the upcoming year, and Commissioner Fassett seconded. The motion passed unanimously. A copy of the Engineering Committee Report is attached as Exhibit G.
- c. Resolution Approving Change to Accounting Procedures for Non-Irrigation Season Canal Diversions for Groundwater Recharge Purposes & Associated Update to Rules & Regulations: This agenda item was split into three separate actions by the commissioners: (1) to approve the resolution, (2) updated accounting, and (3) updated rules and regulations. Schellpeper described the resolution that was before the commissioners and Commissioner Fassett moved to adopt the resolution and Commissioner Barfield seconded. The motion passed unanimously. Commissioner Wolfe introduced the RRCA Accounting Procedures and Reporting Requirements that would be voted upon and are included as an attachment to Exhibit H. Commissioner Barfield moved to adopt the new RRCA Accounting Procedures. Commissioner Fassett seconded the motion. The motion passed unanimously. Commissioner Wolfe introduced the new RRCA Rules and Regulations dated August 24, 2016. Commissioner Fassett made a motion to adopt the new rules and Commissioner Barfield seconded. The motion passed unanimously. A copy of the resolution and amended rules and regulations is attached as Exhibit H.

- d. Resolution Approving Colorado’s Resolution Dated August 24, 2016: Commissioner Wolfe thanked the other states for their cooperation and recognized a number of state participants for their efforts in coming to an agreement on long-term operations of the Colorado Compliance Pipeline. Commissioner Wolfe provided an introduction to the resolution and then moved to adopt the resolution approving long-term operation of the Colorado Compact Compliance Pipeline. Commissioner Barfield seconded and the motion passed unanimously. A copy of the resolution is attached as Exhibit I.
- e. Resolution Approving Long-Term Agreements Related to Operation of Harlan County Lake During Compact Call Years: Commissioner Fassett gave a brief history of how the operations in the basin have necessitated the current resolution. He noted that this resolution would provide Kansas flexibility in the use water they are entitled to under the compact while providing credits and certainty to Nebraska. Commissioner Fassett moved to adopt the resolution, and Commissioner Barfield seconded. The motion passed unanimously. A copy of the resolution is attached as Exhibit J.

Agenda Item #9: Remarks from the Public

Dennis Coryell is a member of the Republican River Water Conservation District. He congratulated the three states for this step forward, but noted that it had taken much longer than it should have. He noted that assurance for the water users should be on the minds of the commissioners as they wrap up the last remaining issues.

Rick Billinger is a state representative for Kansas. He congratulated the commissioners for their accomplishments at the meeting. He liked the fact the commissioners were still talking about the possibility of storing water in Bonny Reservoir and encouraged the practice of leaving water in the aquifer, if possible, rather than storing it in Harlan County or Trenton.

Peter Ampe is counsel for the Republican River Water Conservation District. He clarified a statement made by Mr. Coryell, noting that the District had passed their own resolution regarding operation of the pipeline, not the version that was acted on today. In order to provide clarity, he entered a copy of the resolution into the record. Attached as Exhibit K.

Brad Edgerton with the Frenchman-Cambridge Irrigation District. He wanted Colorado to be aware that the district is waiting for the state to be in compliance and would like to encourage discussion on compensation for previous over-use by Colorado.

Agenda Item #10: Future Meeting Arrangements


Colorado will be hosting the RRCA annual meeting for 2017 as well. Commissioner Wolfe stated the 2017 meeting would be held in the Burlington or Wray area and the actual dates will be agreed upon at a later date

Agenda Item #11: Adjournment

The meeting was adjourned at 3:24 p.m. on August 24, 2016.

The August 24, 2016 Annual Meeting report is hereby approved by unanimous vote of the RRCA on this 21st day of August, 2018.

As indicated by their signature and date below, the RRCA Commissioners agree that the report was approved by RRCA on the date indicated above.



Kevin Rein, Chair and Colorado Commissioner

DATE SIGNED: 8-21-18



Gordon W. "Jeff" Fassett, Nebraska Commissioner

DATE SIGNED: 8/21/18



David Barfield, Kansas Commissioner

DATE SIGNED: 8/21/2018

Exhibits

- Exhibit A: Transcript of the 2016 Annual Meeting
- Exhibit B: Attendance of the 2016 Annual Meeting with Sign-In Sheets
- Exhibit C: Final Agenda for the 2016 Annual Meeting
- Exhibit D: Bureau of Reclamation Report, *Nebraska-Kansas Area Report to the Republican River Compact Administration*, August 24, 2016
- Exhibit E: U.S. Army Corps of Engineers Presentation, *Harlan County Dam Tainter Gate & Irrigation Repairs*, August 24, 2016
- Exhibit F: U.S. Geological Survey Report, *Republican River Compact, Nebraska Stream-Gaging Data, Water Year 2015*, August 24, 2016
- Exhibit G: Engineering Committee Report for the 2016 Annual Meeting
- Exhibit H: Resolution Approving Change to Accounting Procedures for Non-Irrigation Season Canal Diversions for Groundwater Recharge Purposes & Associated Update to Rules & Regulations
- Exhibit I: Resolution Approving Colorado's Resolution Dated August 24, 2016
- Exhibit J: Resolution Approving Long-Term Agreements Related to Operation of Harlan County Lake During Compact Call Years
- Exhibit K: Resolution by the Republican River Water Conservation District Board of Directors Regarding Resolving Certain Issues Between the States of Kansas and Colorado Regarding the Republican River Compact (Resolution 16-02).

2016 ANNUAL MEETING OF THE
REPUBLICAN RIVER COMPACT ADMINISTRATION

Burlington Community Center Conference Hall
340 South 14th Street
Burlington, Colorado 80807

Wednesday, August 24, 2016

1:30 p.m.

The above-entitled meeting was taken at the Burlington Community Center Conference Hall, 340 South 14th Street, Burlington, Colorado, before Denise A. Freeman, Registered Professional Reporter and Notary Public within Colorado.

1 ATTENDANTS:

2 For Colorado:

- 3 Dick Wolfe, Commissioner and Chair
- 4 Ivan Franco, Colorado Water Resources Engineer
- 5 Scott Steinbrecher, Colorado Attorney General's Office
- 6 Mike Sullivan, Colorado Deputy State Engineer
- 7 Willem Schreuder, Principia Mathematica

8 For Nebraska:

- 9 Gordon W. "Jeff" Fassett, Commissioner
- 10 Jennifer Schellpeper, Nebraska Department of Natural Resources
- 11 Justin Lavene, Nebraska Attorney General's Office

12 For Kansas:

- 13 David Barfield, Commissioner
- 14 Chris Beightel, Kansas Division of Water Resources

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1 P R O C E E D I N G S

2 COMMISSIONER WOLFE: Good afternoon,
3 everyone. I am Dick Wolfe, state engineer for Colorado
4 and Commissioner for the Republican River Compact for
5 Colorado, and I am going to call to order the 2016
6 annual meeting of the Republican River Compact
7 Administration.

8 First, we would like to take this opportunity
9 to do some quick introductions. We think it's important
10 to recognize certainly those of us who have been
11 involved with the Administration and involved in the
12 activities of preparing for today's meeting and the
13 engineer advisers who assist us.

14 But we're going to give an opportunity for
15 folks in the audience, too, to recognize themselves
16 because all of you have been a part of this as well.

17 So here at the table with me to my left is
18 Ivan Franco, the engineer adviser for Colorado. To my
19 right, Willem Schreuder with Principia Mathematica, who
20 assists the RRCA and Colorado and, frankly, all three
21 states in the groundwater modeling and accounting
22 efforts. Then Scott Steinbrecher, who's with the
23 Colorado Attorney General's Office. And behind me is
24 Mike Sullivan, deputy state engineer.

25 And then I have got other staff members here

1 as well that are in the audience. And as we move
2 through the audience, I will have them recognize
3 themselves along with the rest of you as well.

4 So at this time for introductions, I would
5 like to turn it over to Commissioner Barfield.

6 COMMISSIONER BARFIELD: Thank you very much.
7 My name is David Barfield. I am chief engineer with the
8 Kansas Division of Water Resources and Commissioner for
9 the State of Kansas on this Administration. And I have
10 with me Chris Beightel, program manager with the Water
11 Management Services Program.

12 And there's a number of other staff in the
13 audience, and I will do the same thing, let that happen
14 as we do introductions out there.

15 COMMISSIONER WOLFE: Thank you. Commissioner
16 Fassett.

17 COMMISSIONER FASSETT: Yes. Thank you,
18 Mr. Chairman. I am Jeff Fassett. I am the director of
19 the Nebraska Department of Natural Resources and also
20 the State Commissioner for the state of Nebraska.

21 At the table with me today is Justin Lavene
22 with our Nebraska Attorney General's Office, and
23 Jennifer Schellpeper, senior member of my staff and is
24 also a member of the engineering committee.

25 We too have a number of other DNR staff and

1 many of our technical and legal advisers who will
2 introduce themselves as well.

3 COMMISSIONER WOLFE: And as Jennifer is
4 taking the mic to the audience, we will go around. If
5 you could at least speak clearly into that, we are
6 recording this, and so our reporter will try to capture
7 this. And, again, we will recognize everyone that's
8 here and have them as part of the record. We appreciate
9 your attendance.

10 I would also like to just take a quick moment
11 to thank the Burlington Community Center, this facility
12 we're in, for providing this facility. And also for the
13 refreshments that they provided, both yesterday and when
14 we have our meetings here, as well as today. So thank
15 you for that.

16 And also for the Republican River Water
17 Conservation District who sponsored our reception
18 yesterday evening after we broke from our other
19 meetings. So thank you as well, and representatives
20 that are here from the board.

21 At this time we'll start with Jesse, and if
22 you could just introduce yourself and pass the mic
23 around, we would appreciate it. Thank you.

24 AUDIENCE INTRODUCTIONS:

25 I'm Jesse Bradley. I'm with the Flatwater

1 Group in Lincoln, Nebraska.

2 Chance Thayer, Flatwater Group in Imperial,
3 Nebraska.

4 Jasper Fanning with the Upper Republican
5 Natural Resources District.

6 Brad Edgerton with Frenchman-Cambridge
7 Irrigation District.

8 Pete Gile, Kansas, Bostwick Irrigation
9 District.

10 Bob Martin. I'm the secretary for the
11 Republican River Restoration Partners.

12 Dave Keeler, DWR, Colorado.

13 Chelsea Erickson with the Kansas Division of
14 Water in the Stockton field office.

15 Chris Purzer, U.S. Army Corps of Engineers.

16 Craig Scott with the Bureau of Reclamation.

17 John Miller with the U.S. Geological Survey.

18 I'm Mark Groff with the Flatwater Group.

19 Thomas Perks, Department of Natural Resources
20 in Nebraska.

21 Shane Stanton with the Nebraska Department of
22 Natural Resources in Cambridge.

23 I'm Bob Merrigan, assistant manager of the
24 Republican Natural Resources District, Nebraska.

25 Scott Dicke, Republican Natural Resources

1 District.

2 Mike Clements, Lower Republican Natural
3 Resources District.

4 Jim Koelliker, KSU, Manhattan, retired.

5 Ginger Pugh, Kansas Division of Water
6 Resources, Manhattan.

7 Shannon Kenyon with Northwest Kansas
8 Groundwater Management District.

9 Scott Hooker, farmer.

10 Hongsheng Cao, Kansas Water Office.

11 I'm Randy Hayzlett. I am for the State of
12 Kansas on the Arkansas River Compact Administration.

13 Ralph Ostmeyer, state senator, 40th District,
14 from Grinnell, Kansas.

15 Rick Billinger, state representative of the
16 120th District, Goodland, Kansas.

17 Rachel Duran, Kansas Division of Water
18 Resources out of the Garden City field office.

19 Kevin Salter, Kansas Division of Water
20 Resources out of Garden City.

21 John Thorburn, manager of Tri-Basin NRD, in
22 Holdrege, Nebraska.

23 Sam Perkins with Kansas DWR out of Manhattan.

24 Zablon Adane, Department of Natural
25 Resources, in Nebraska.

1 Jason Lichty, farmer from Colorado.
2 Mike Delka, manager, Bostwick Irrigation
3 District in Nebraska.
4 Deb Daniel, general manager of the Republican
5 River Water Conservation District, Colorado.
6 Dan Stephens, farmer, from St. Francis,
7 Kansas.
8 Dustin Ridder, farmer, Burlington, Colorado.
9 Gary Mulch, farmer, Burlington, Colorado.
10 Carol Flaute, Nebraska Department of Natural
11 Resources.
12 Tony Mangus, board member for CAPA.
13 Bethleen McCall, CAPA, City of Yuma and Yuma
14 Conservation District.
15 Dennis Wieser, CAPA and farmer.
16 Kenny Helling, board member of Arikaree
17 Groundwater Management District, Colorado.
18 Rod Mason, manager of the Arikaree
19 Groundwater Management District in Colorado.
20 Corey DeAngelis, Colorado Division of Water
21 Resources.
22 Brandi Baquera, district manager, Plains
23 Groundwater Management District.
24 Ted Tietjen, Republican River Restoration
25 Partners.

1 Brian Rosene, farmer from Kansas.

2 Tony Leighty, Stratton Equity Co-op.

3 Mark Cure, farmer, Colorado.

4 John Caraday.

5 Tom Jackson, farmer, Colorado.

6 Tyson Reents, land broker in Colorado.

7 Devin Ridnour, Colorado DWR.

8 Breann Ferguson, Colorado DWR.

9 Chris Kucera of the Colorado Division of
10 Water Resources.

11 Matt Hardesty, Colorado Division of Water
12 Resources.

13 Tim Pautler representing the RRWCD in
14 Colorado.

15 Peter Ampe, counsel for the Republican River
16 Water Conservation District.

17 Dennis Coryell, Republican River Water
18 Conservation District and the Plains Groundwater
19 Management District.

20 COMMISSIONER WOLFE: Thank you, everyone. I
21 think we have caught everyone on that.

22 We will move on to agenda item 2, Adoption of
23 the Agenda. I will provide some clarification to one of
24 the agenda items and then ask the other Commissioners if
25 they have any other changes to the agenda.

1 This is in reference to agenda item 8(c).
2 We'll actually be taking three separate actions
3 underneath that agenda item, one for the resolution and
4 then one in regards to the accounting procedures that
5 have been updated as a result of that, as well as taking
6 action on an update to the rules and regulations as a
7 result of the changes under the resolution as well.

8 So with that clarification, are there any
9 other changes to the agenda?

10 COMMISSIONER BARFIELD: There's none to the
11 agenda that we finalized this morning. I would note
12 maybe for the audience, we did make an addition under
13 Old Business that I don't think is reflected in what was
14 provided at the beginning. Is that correct, Ivan?

15 COMMISSIONER WOLFE: That's correct. We do
16 have -- there may have been an older version of the
17 agenda out there, so if you could go ahead and just
18 clarify that as well. Thank you, Commissioner.

19 COMMISSIONER BARFIELD: So we have an
20 additional item that we will be doing under Old
21 Business. It's 7(b), Status of Report and Transcripts
22 for the 2014 Annual Meeting and Prior Special Meetings.
23 So we will be discussing that under Old Business.

24 And then we made a change to the title for
25 8(d), but it's essentially the same action item.

1 COMMISSIONER WOLFE: Thank you, Commissioner.

2 Any other changes?

3 COMMISSIONER FASSETT: No.

4 COMMISSIONER BARFIELD: I would move adoption
5 of the agenda as we have agreed to.

6 COMMISSIONER FASSETT: Second.

7 COMMISSIONER WOLFE: There's been a motion
8 and a second. All those in favor signify by saying aye.

9 COMMISSIONER FASSETT: Aye.

10 COMMISSIONER WOLFE: Aye.

11 COMMISSIONER BARFIELD: Aye.

12 COMMISSIONER WOLFE: Motion approved.

13 Next, Status of Report and Transcripts for
14 2015 Annual Meeting and Prior Special Meetings.
15 Jennifer.

16 MS. SCHELLPEPER: Thank you, Commissioner.

17 At this time we've had four meetings in total that would
18 be in the 2015 annual meeting report. Of those, two of
19 the meeting materials have been fully circulated amongst
20 the states and returned. Two of those are still being
21 worked on.

22 So when those two are also completed, we will
23 be ready to have a final product on the 2015 annual
24 meeting.

25 COMMISSIONER WOLFE: Thank you. Are there

1 any questions? Hearing none, we will move on to agenda
2 item 4, Report of Chairman and Commissioners' Reports.
3 So the first item up is the Kansas report.

4 COMMISSIONER BARFIELD: Thank you, Chairman
5 Wolfe. It's a pleasure to be here in Burlington again.
6 Appreciate your hosting the meeting as well as the
7 others you have recognized. Look forward to a very
8 productive meeting today.

9 Also I do want to recognize -- we do have two
10 Kansas legislators here. And they were introduced, but
11 I appreciate both Senator Ostmeyer and Representative
12 Billinger being here. They are both legislators for
13 northwest Kansas. Very active and interested in these
14 issues, and we appreciate you being here.

15 So we've spent a lot of time and energy on
16 inter-state issues and particularly on the Republican
17 River.

18 I know that Chris and I and our staff, but
19 also a number of other members of state government -- my
20 boss, Secretary of Agriculture Jackie McClaskey,
21 Assistant Secretary Susan Metzger, Program Manager for
22 the Water Appropriations Program Lane Letourneau, as
23 well as the director of the Kansas Water Office, Tracy
24 Streeter, and the Assistant Director Earl Lewis, have
25 all been very active in something you are going to be

1 hearing a lot about today as we move through here, and
2 that's our progress on the Republican River.

3 And I just want to just recognize them at the
4 onset. Even though most of them are not here today,
5 they have been very instrumental, along with our
6 counterparts in Nebraska and Colorado, to sort of get us
7 where we are today.

8 Our extensive efforts have borne fruit, and
9 you will hear about that. And I will leave additional
10 discussion of that to our New Business items later in
11 the agenda. But I appreciate them and all of their work
12 with the states.

13 So with respect to the Kansas report on other
14 matters, I have reported in other years that, starting
15 in 2013, our governor challenged the state agencies and
16 really the stakeholders to be involved in shaping a
17 50-year vision for water.

18 And we have been continuing in that process,
19 more of an implementation of the broad objectives and
20 strategies that were developed in previous years, as
21 well as working in regional advisory committees to
22 develop strategies and priorities on a more local level.

23 And we have been actively working through
24 that in a number of different venues. One, in our
25 legislative arena. Secondly, in promulgating

1 regulations that implement those policies and programs
2 to move forward to better manage our water.

3 In terms of legislation, I would just like to
4 give a brief report on legislative items of
5 significance. Last year I gave a report on our 2015
6 legislature, which had a number of different pieces
7 regarding that vision.

8 This year our legislative agenda was much
9 more narrow. There were a couple clean-up bills that
10 were done on penalties for nonreporting of water use and
11 on our multiyear flex account programs, but nothing
12 really earthshaking.

13 We also had a bill that requires the Division
14 to do additional notices and posting of items on the
15 websites, and we are to provide notice to our
16 groundwater management districts of any rules and
17 regulations that we are working through that might
18 affect them.

19 We're now required to post on our website all
20 complete applications for new appropriations or change
21 applications, as well as the final orders related to
22 those same activities.

23 And any imperative actions that we are
24 taking, we're required to provide notice to the area --
25 those that are affected in the immediate area and,

1 again, provide notices on our website of any orders in
2 connection with those actions. So a bit more -- just
3 being more transparent in terms of our activities and
4 how they may affect water users.

5 We have also been very active in implementing
6 one of last year's legislative initiatives in regard to
7 something called Water Conservation Areas that allow for
8 a more flexible operation of water rights when they are
9 facilitating reductions in water use in some of our
10 areas of overappropriation and continue to be very
11 active in terms of promoting that tool and working with
12 water users who want to, again, reduce their total use
13 and be provided additional flexibility to accomplish
14 that purpose.

15 In terms of the Republican River Basin,
16 Northwest Kansas GMD No. 4, Shannon Kenyon is here with
17 that groundwater management district. They continue to
18 be very active in terms of looking at their management
19 of groundwater and how it might be accomplished in a
20 responsible way.

21 Northwest Kansas GMD No. 4 has the only local
22 enhanced management area that is within our state. It
23 is a tool that was developed in 2012. It's in the
24 Sheridan County area and that is now in its fourth year
25 and has been very successful and, I think, a model for

1 others to look at.

2 The GMD board is very actively exploring the
3 idea of a districtwide Local Enhanced Management Area or
4 LEMA. They have been actively working with us and their
5 water users to look at options to do that and, I think,
6 have developed a framework that is very sensible. They
7 have essentially taken each township within their GMD
8 and looked at the long-term rate of decline of the
9 aquifer.

10 There are some parts of the GMD that have had
11 no decline, some with very limited decline, and other
12 areas with a larger decline. They are essentially
13 providing that area in townships where there's no
14 decline or very limited decline and no additional
15 activity needed.

16 But in areas of moderate or high decline,
17 they are looking at a sort of five-year allocation
18 mechanism with more stringent allocation in areas of
19 greater decline. So that's still under discussion and,
20 again, an active dialogue with the water users, but that
21 board is committed to sort of see the discussion
22 through. And we are encouraged by their efforts and are
23 supporting their efforts very strongly.

24 I think with that, those are the major things
25 that I think would be of interest to this administration

1 that are not on our agenda elsewhere, and I will close
2 with that.

3 COMMISSIONER WOLFE: Thank you, Commissioner.
4 Any questions for the Commissioner?

5 All right. On to agenda item 4(b). I will
6 go ahead and give the report for Colorado. I would like
7 to just update folks on activities that Colorado has
8 undertaken and I've been involved with myself personally
9 and my staff since our last meeting in August of 2015 in
10 Lincoln, Nebraska.

11 As you recall, in October of 2014, the RRCA
12 approved operation of our compact compliance pipeline
13 and we operated through 2015 with the understanding that
14 Colorado would undertake a series of work action items
15 with Kansas and Nebraska, which we did, and we had very
16 productive meetings in regards to that.

17 And one of the provisions under that
18 resolution was that, if Colorado achieved that, that
19 basically we would have automatic approval under the
20 same conditions to operate in 2016 for the compact
21 compliance pipeline.

22 And since we did meet that goal by
23 November 1, Colorado continued, with the assistance of
24 the Republican River Water Conservation District, to
25 operate the compact compliance pipeline in our overall

1 efforts to achieve compact compliance.

2 And they have done a remarkable job operating
3 that. I think it's been pretty flawless operations and
4 we have had great coordination with the District along
5 with the water users and Nebraska and Kansas in its
6 operation. So we appreciate everyone's efforts and
7 continue that.

8 2016 does represent the third year of
9 operation, now that that pipeline has been constructed
10 and operational. And, again, those have been
11 essentially under annual approvals. And as you will
12 hear later today in our action items, what we have been
13 working on during those years as well and up until even
14 last evening, working towards long-term agreements for
15 both Nebraska and Colorado.

16 So as part of those efforts, the three states
17 have continued to meet on a monthly basis. Certainly I
18 think now -- time goes quickly, but maybe the last
19 couple years now or more; I think back how quickly time
20 gets by us -- and we will talk about this more later,
21 but those efforts have really been productive and
22 fruitful. We have made great strides for all three
23 states in representing our water users.

24 One of the other activities that Colorado had
25 under way in 2015 was an amendment to the well

1 measurement rules that were adopted in 2008. Again,
2 another step in our overall efforts for compact
3 compliance efforts in the basin. You can't manage what
4 you don't measure.

5 And so these rules that we adopted in 2008
6 were very important for those efforts and continue
7 today. You have heard some of the discussion, if you
8 were here at part of the workshop this morning, about
9 some of the accounting we do and utilizing pumping
10 records from our wells for those accounting procedures.

11 So we amended those rules, and that was
12 completed in September, those amendments. And there
13 were a lot of cleanup changes that were in there, but
14 some of the more substantive things were to amend those
15 existing boundaries for the well measurement rules to
16 include some additional wells in the southern part of
17 the basin and some -- a few wells up around the Akron
18 area that weren't originally included in the original
19 2008 rules.

20 So I know Scott Steinbrecher and some other
21 staff that are here today that you've heard from were
22 very instrumental in getting those rules amended.

23 And as I have indicated, these well
24 measurement rules are important to get, obviously, an
25 indication of individual pumping from wells. And also

1 it helps us as part of our overall compliance efforts
2 and enforcement efforts on individual wells as we
3 compare those pumping amounts to their permitted amounts
4 to ensure that they do not exceed what they are allowed
5 to under their original -- or final permits.

6 Also in June of this year, 2016, I
7 established a 41-member advisory committee to assist me
8 in developing what I am referring to as compact
9 compliance rules.

10 And really the essence of these rules is to
11 reflect kind of the last chapter in this process that I
12 have personally been involved with since early 2008 in
13 helping Colorado and working with the District and the
14 water users in their overall efforts for compact
15 compliance.

16 And these rules kind of bring together in a
17 way to just basically indicate that you need to
18 participate in some type of plan or compliance plan out
19 there or, if you are not in a current plan, set up a
20 plan to do that to achieve -- help us in achieving
21 compact compliance.

22 And so we have been meeting -- we had a
23 public outreach meeting in May and then had indication
24 from that meeting that we would move forward with the
25 rule-making, and we started that in July. We have had a

1 meeting in July and August, so two meetings to date.

2 And I think they have been very productive meetings.

3 We're continuing to develop the framework of
4 the rules. And if you are interested in kind of the
5 process that we are involved with, the advisory
6 committee process, and the current draft of those rules,
7 all of that information is on the Colorado Division of
8 Water Resources website. And also the minutes from the
9 meetings, any presentations that we have done to date,
10 are also included on our website.

11 Also I would like to report that Colorado was
12 successful this past year in getting the FSA to increase
13 the CREP rental rate to \$180 per acre. This new rental
14 rate will go into effect in Colorado starting October 1,
15 2016.

16 And, again, this is an important program --
17 has been for the last 10 or so years -- in helping
18 through voluntary efforts, with assistance from the
19 District and any additional funds that they provide to
20 that program from the Federal part of it, to fallow
21 lands within the basin.

22 We have had a significant number of acres
23 brought in through these voluntary efforts and will
24 continue to do that going forward. You will hear in our
25 resolution later today how important that's going to be,

1 those kind of voluntary efforts, in terms of looking
2 towards the future and achieving compact compliance.

3 And with that, unless there's any questions,
4 that concludes my report. Hearing none, Commissioner
5 Fassett, I will turn it over to you for your report.

6 COMMISSIONER FASSETT: Very good. Thank you,
7 Mr. Chairman. Again, I appreciate -- I will add my
8 thanks, along with David, to Colorado's hospitality the
9 last couple days. Been a great place. I had not been
10 to Burlington in a long time, and so it was good to come
11 back and to join with you all.

12 I have now sort of completed my first year
13 with you all. When we last met, I think I had been on
14 the job about a week, so it was embarrassing to read the
15 transcript from last year's meeting, so -- anyway, so I
16 am glad to be here.

17 We have spent an enormous amount of time
18 together in concluding our efforts, but, again, I think,
19 as I am sure we will discuss later, those are really the
20 first foundational step to a lot more to come. So our
21 meetings are not over.

22 Anyway, Nebraska, we are in compliance. We
23 are doing a lot. We have continued to do a lot.
24 Certainly in the short tenure I have been here, we have
25 taken great efforts to fulfill our obligations to Kansas

1 and their water users in the downstream area.

2 And we have worked, as we have for so many
3 years, so closely with our natural resource districts
4 who have made many of the investments, along with the
5 State of Nebraska, to put us in a position where we can
6 together, as well as within Nebraska, really manage all
7 of the resources that we have available to maximize our
8 beneficial use of the allocations under this compact,
9 and so that work continues.

10 During the past year or so, both the
11 Rock Creek and N-Corpe stream flow augmentation projects
12 have continued to operate periodically through the last
13 couple years.

14 We would like Mother Nature to help us out so
15 we wouldn't have to pump so much water, but those are
16 great new tools, along with a variety of water
17 management actions and controls that both the State and
18 the natural resource districts have undertaken to
19 aggressively manage the surface and groundwater so we
20 can stay within compliance. Being out of compliance is
21 no longer an option.

22 We have got a lot of the same sort of
23 temporary leasing arrangements. The CREP program has
24 been very valuable in the state of Nebraska as well.
25 There's about 36,000 acres in our part of the basin

1 that's been part of that program.

2 We have just renewed -- the State of Nebraska
3 just renewed their agreement with the FSA allowing for
4 re-enrollments as well as new lands, and we're going to
5 continue with increased rates to use that tool as well.

6 And, again, our natural resource districts
7 have continued to add their own programs, as well as
8 with CREP, to look at both permanent and temporary
9 retirement of lands, leasing of surface water,
10 groundwater projects -- just a variety of activities --
11 together with the augmentation stream flow supplemental
12 flows to really help us in a much more efficient manner,
13 not only manage the water, but make better beneficial
14 use of those waters as best we can.

15 There's been some interest in evaluation of a
16 new augmentation project. I know a number of you have
17 asked me about it. There is a proposal that's under a
18 feasibility review at this point in our state.

19 It's a project that's being proposed by the
20 Tri-Basin and the Lower Republican NRDs to look at
21 potentially diverting surplus waters from the Platte
22 system using an existing canal system to bring those
23 waters and to deliver them into the Republican Basin.

24 The laws of the State of Nebraska allow for
25 those kinds of transfers, but at this point the project

1 is really at an early stage. They've been going through
2 a very detailed feasibility study, both hydrology,
3 preliminary engineering cost estimates, things of that
4 nature, to see if that project is worthy of continuing
5 investment.

6 So we are going to be monitoring that and
7 continue to report to the other states on that activity.
8 So that's under way. I think the first-level study is
9 expected to be done perhaps by the end of the year. So
10 we will see what the next level of study will be.

11 If, ultimately, that project looks like it's
12 feasible, then that will require an application for a
13 permit to provide authorization from my department to
14 allow for that to occur. So that will be, again, a
15 legislatively authorized process that's been in law for
16 a number of years in our state.

17 We've reported in the past on a new water
18 resource development fund in our state. It's called the
19 Water Sustainability Fund. That was created in 2014.
20 Had a couple years' worth of funding, and we've finally
21 gotten all the various rules and procedures and
22 guidelines in place.

23 And just this past April, our Natural
24 Resources Commission, a separate 27-member body,
25 actually went through a very detailed process to rank

1 applications for funding support from the State and then
2 to award state dollars to the highest ranking projects
3 that are worthy of investment.

4 About 17 projects were approved this past
5 April for about \$11 million. And we are now at -- the
6 contracting and the dollars are beginning to flow out on
7 that first round, but we've already begun the second
8 round of applications for that fund.

9 That window opened and closed during this
10 past July, just last month. We had another 33 new
11 applications for water resources projects, including a
12 proposal from Brad's district and the Republican River
13 Basin looking for some State's funding support from this
14 fund.

15 We had about \$45 million in requests in this
16 last round for projects. There's only about 20- to
17 25 million available, but still a substantial amount of
18 water. This is a real commitment by our legislature to
19 really look for a longer-term sustainable program to
20 invest in water sustainability. And we expect those
21 dollars will flow to this basin as well as to projects
22 all across Nebraska.

23 Quickly, we have -- I think, as we have
24 reported in the past, we have our own statewide water
25 basin planning process going on in the Republican River

1 Basin as well. That got started over a year and a half
2 ago, before I arrived, and that process is continuing.

3 We have already had seven sort of major
4 stakeholder group meetings. They are operating on a
5 consensus basis to wrestle through setting up goals,
6 beginning to talk about objectives, and then the details
7 of areas of both common interest and those -- whether
8 there's going to be some controversy in a water planning
9 process.

10 They have targeted a process at the moment
11 that could last through about next June of 2017 as the
12 public stakeholder group, at which point the State and
13 the natural resource districts will pick up work from
14 all of those efforts and go through the review and
15 approval process under our planning state law process.

16 But there's a number of elements that I think
17 are going to be of interest. It blends together the
18 complex situation we have in the Republican with both
19 our surplus water and groundwater users, the work that
20 we do here amongst the states, as well as the internal
21 allocations, the distribution, water administration,
22 water management with the Bureau reservoirs and other
23 facilities.

24 So it is quite a mix of stuff for our state.
25 It's an important process. As I said, we have got a

1 group of 50, 60 stakeholders that have agreed amongst
2 themselves to operate it by consensus. So that will be
3 a real challenge, to sort of wrestle through some very
4 difficult issues on what they want to recommend from a
5 basinwide standpoint within the state of Nebraska. So
6 we will continue to keep you updated on that one.

7 And, like you, I think we have spent a lot of
8 time together. We look forward to the discussions later
9 on the agenda today. It's been sort of -- been sort of
10 hectic, but rewarding.

11 I think we are very glad, from Nebraska's
12 perspective, that we really targeted this meeting to
13 force ourselves to really focus on what we need to get
14 done amongst us as states to set the framework for much
15 more detail and greater discussions that are going to
16 come with water users and others.

17 With that, I think I will pass -- take a
18 little but more of our time, Mr. Chairman, and let
19 Jennifer report on some of the administration overview
20 from 2015.

21 MS. SCHELLPEPER: Thank you, Jeff.

22 If you could hand these around, there's a few
23 copies there, mostly for the Commissioners.

24 Real quick, I know in past years we've kind
25 of gone through this in mind-numbing detail of water

1 administration, so we are not going to do that.

2 This time around just hit on a couple of
3 highlights. In January of 2015, we did notify the
4 holders of irrigation and storage permits that it would
5 be a compact call year, so that was in effect for 2015
6 in Nebraska. And then we had a number of closing
7 notices, more than 130, that were issued in the first
8 week of July, and most of those folks are then coming
9 back open again in September of 2015.

10 And so you can see more details on the sheet
11 that I have handed around, but those are the highlights
12 that I was going to point out today. Are there any
13 questions?

14 COMMISSIONER FASSETT: Thank you, Jennifer.
15 That's the report from Nebraska.

16 COMMISSIONER WOLFE: Thank you, Commissioner.
17 Any questions for the Commissioner?

18 I'd just like to comment. In one of your
19 reports, you talk about this feasibility study for a
20 potential new augmentation project and taking surplus
21 waters from the Platte system.

22 I'd just like to let the record reflect who
23 your upstream neighbor is that helps provide those
24 surplus flows. At some future date I hope we get some
25 recognition for those efforts.

1 COMMISSIONER FASSETT: Mr. Chairman, I will
2 be happy to give you that recognition if you make sure
3 they continue to come downstream.

4 COMMISSIONER WOLFE: I am still looking for
5 our gauging stations that came down in 2013 that you
6 haven't returned yet, so -- we've had to spend about
7 half a million dollars replacing them, so if you do find
8 any remnants of them, we would certainly like to have
9 them back. Thank you. All in jest.

10 At this time we always provide an opportunity
11 for our Federal partners to provide a report to the
12 Commissioners. And we have three agencies here that we
13 work very closely with in terms of our compact
14 compliance efforts and operations within the Republican
15 River Basin.

16 And certainly we could not do that without
17 these respective agencies, so we want to give them an
18 opportunity to come forward and give us a presentation
19 and update.

20 So the first one up is Craig Scott with the
21 Bureau of Reclamation. We have a podium here, and if
22 you could hand him that mic, that would be great. Thank
23 you.

24 MR. SCOTT: Good afternoon, Commissioners. I
25 am Craig Scott, representing Reclamation in the

1 Nebraska/Kansas area office.

2 I provided copies of our annual report to
3 each of you on your tables there. It's very similar to
4 what we have submitted in the past, so I will not go
5 through that in much detail, but I will just touch on a
6 few highlights.

7 Also, just for reference, I did provide extra
8 copies on the back table if folks in the audience are
9 interested.

10 The report contains 2015 operational data for
11 each of our reservoirs in the basin and a status update
12 for each reservoir through July 31, 2016.

13 One thing I would like to highlight is the
14 Water SMART Republican River Basin study which was
15 completed in early 2016. The study was a cooperative
16 effort between Reclamation and the states of Nebraska,
17 Kansas and Colorado.

18 I would like to thank each state for their
19 collaborative efforts in completing this study. And for
20 reference on that report, the final study report can be
21 found on Reclamation's website.

22 Also, as you are aware, Reclamation has
23 attended several meetings with Nebraska DNR throughout
24 the spring and summer regarding the operations of the
25 basin and, in particular, the operations of Harlan

1 County Lake.

2 In connection with these meetings, we were
3 informed of the draft resolution, which is on your
4 agenda today. And in the interest of working together,
5 Reclamation asked for a copy of that draft on several
6 occasions but did not receive a copy before today.

7 So in order to further our cooperation
8 effort, Reclamation stands ready to assist the states
9 and the irrigation districts in developing an
10 operational plan for 2017. However, we would request
11 the opportunity to give meaningful input on any future
12 resolutions.

13 So thank you. And that concludes my
14 comments.

15 COMMISSIONER WOLFE: Thank you, Craig. Any
16 questions for Craig? Comments? Thank you.

17 Next we have up John Grothaus with the U.S.
18 Army Corps of Engineers.

19 MR. GROTHAUS: Thank you, sir. Thank you,
20 Commissioners.

21 I just have a brief presentation for my
22 purposes to update the status of the Harlan County Dam,
23 Tainter gate, and irrigation facility repairs.

24 There's three major features associated with
25 the project: The Tainter gate and component repairs,

1 the sluice gate repairs, and the irrigation conduit
2 repairs. After all major contracts have been awarded,
3 the total project cost overall is \$39.8 million compared
4 to the originally estimated cost of \$42 million.

5 This will be short. I am just going to talk
6 about the construction status. The Tainter gate
7 contract itself has the bulk of the work.

8 It includes repairing, replacing and
9 modifying the structural steel components, struts, and
10 what-have-you of the Tainter gates, and trimming and
11 replacing the existing trunnion bearings of all 18
12 Tainter gates and the assemblies with new components,
13 replacing the working components of the Tainter gates,
14 repairing or replacing the electrical systems of the
15 gates, repainting the gates and the structural
16 components.

17 The contract also includes sluice gate
18 repairs and painting of the sluice gates as well as
19 fabrication and installation of irrigation stoplogs.

20 The contract was modified to add new
21 irrigation intake trash collects and provide for repairs
22 to one Naponee irrigation slide gate and one Franklin
23 irrigation slide gate and two Franklin canal powerhouse
24 sluice gates.

25 The project is currently 49 percent complete

1 and on schedule to complete in line with the originally
2 anticipated April 2018 completion. As of right now, we
3 have had structural repairs completed on gate numbers 1
4 through 8 and painting completed on gate numbers 1
5 through 7.

6 So we just -- this month we awarded another
7 contract for \$1.13 million for irrigation conduit repair
8 and replacement, which includes repairs to the Naponee
9 and Franklin irrigation conduits, including excavation
10 and removal and replacement of approximately 700 feet of
11 the Naponee conduit and concrete anchors.

12 The work is scheduled to be performed this
13 fall and winter and to be completed prior to beginning
14 of the 2017 irrigation season.

15 And I don't have a report, per se. I have
16 those slides, which you can have. And if you have any
17 questions, I am happy to answer them. And that
18 concludes my presentation.

19 COMMISSIONER WOLFE: Thank you, John. Any
20 questions for John? Thank you very much for being here
21 today.

22 MR. GROTHAUS: Thank, you sir.

23 COMMISSIONER WOLFE: Last, but not least, the
24 USGS, John Miller, if you could come forward. And you
25 should all have a handout that I think he dropped off to

1 us. Take it away, John.

2 MR. MILLER: Thank you, Commissioners, for
3 this opportunity to discuss the USGS activities within
4 the Republican Basin in Nebraska.

5 I would like to apologize ahead of time. I
6 anticipated 40 or 50 copies would suffice, and it looks
7 like we have exceeded that quite a bit. If there's any
8 of you that are interested in getting a copy of the
9 handouts, get with me afterwards and I believe we can
10 get some printed out. I believe each of the
11 Commissioners should have a copy of the handouts.

12 I would also like to point folks to the USGS
13 website. It is very robust. A lot of information is
14 available. The graph that's included in the handout is
15 an annual mean plot, and you can actually get down to
16 the daily mean discharge data from our website, and that
17 is at NE.water.USGS.gov.

18 Again, you can just grab me afterwards if you
19 want more information about how to navigate to that
20 website or get to it. I too am going to be as brief as
21 possible.

22 Currently, in the Republican Basin, the USGS
23 is publishing 18 discharge records from the
24 Nebraska/Colorado state line to the Kansas/Nebraska
25 state line below Harlan County.

1 Three were added this year. That would be
2 Beaver Creek near Beaver City, the Republican River near
3 Guide Rock, and the Republican River near Benkelman.
4 Those are not included in this handout.

5 We had some statistical problems because of
6 the data gap that we have within our database, but we
7 will get that fixed before next year. And, again, the
8 discharge record for all three of those new sites can be
9 found for the period of record on our website.

10 Just a little bit about funding, real quick.
11 Of the 18 sites the USGS produces discharge records
12 from, 15 of those sites are solely funded by a federal
13 program known as NSIP.

14 And the other 3 gauges are cooperatively
15 funded through different state and federal agencies,
16 being the U.S. Army Corps of Engineers, Nebraska
17 Department of Natural Resources, and the Bureau of Rec.

18 Now I would like to go ahead and jump to the
19 handout real quick and just point out what's there and
20 some highlights. And, again, this is a report up to the
21 end of the 2015 water year. The water year, for those
22 of you that are not familiar with that, extends from
23 October 1 to September 30.

24 But the graph that you see is, again, an
25 annual mean discharge that stems for the entire period

1 of record. And I think it does a really good job of
2 displaying the discharge trend that we see in the
3 Republican Basin. And also, on the back of that
4 handout, there's going to be contact information to our
5 director and assistant director.

6 And then just some highlights. You guys have
7 the handouts you can go through. But 6 of the 15 sites,
8 some statistics that probably aren't all that popular,
9 but it is what it is.

10 Six of the 15 sites were within the top 10 of
11 the lowest annual mean discharge for the period of
12 record. 2015 was slightly wetter and cooler and
13 improved overall flows throughout the basin.

14 There's a substantial drop that you are going
15 to see with the discharge for Rock Creek, and that
16 was -- as has been discussed by previous folks, that was
17 due to a decrease in the augmented flows from the
18 augmentation project there.

19 Red Willow Creek had the second lowest annual
20 flow for the period of record, and that stems back to
21 1962.

22 The Frenchman Creek at Palisade gauge, we
23 reported the third lowest annual mean discharge since
24 1951.

25 Buffalo Creek near Haigler was the third

1 lowest annual mean discharge since 1941.

2 The South Fork, we did see much improved
3 flows at that site this year compared to the previous
4 year that had no flow. That was largely due to an
5 increase in precipitation throughout the basin.

6 An interesting little note, the peak that
7 went through Stratton, the Republican River near
8 Stratton, that rainfall event in late May of 2015 had a
9 period of record peak gauge heightwise that stems back
10 to 1950 at a gauge height of 10.92. That rainfall event
11 that occurred near Benkelman downstream generated about
12 2430 cubic feet per second on the peak.

13 We have also been able to improve some of the
14 gauge operations throughout the basin. We have added
15 three radar gauges in the past four years, which
16 definitely improve the overall quality and the
17 completeness of the record.

18 Also I am back at full staff in the North
19 Platte field office, so our record computation is much
20 improved over the past year. Fourteen of the 18 records
21 have been approved up to the May-June time frame of
22 2016. And we are currently in the process of approving
23 record all the way up to our August discharge
24 measurements of 2016.

25 And I believe that is the end of my report.

1 And, again, we have added -- and I mentioned this at the
2 beginning -- Beaver Creek and Republican River at Guide
3 Rock and Republican River at Benkelman are stations that
4 have been newly added this past year. And they can be
5 found on our web page.

6 With that, I'll turn it back over.

7 COMMISSIONER WOLFE: Thanks, John. Any
8 questions for John? Thank you much.

9 At this time we are to the committee reports,
10 and I'd like to turn the microphone to Ivan Franco to
11 give us an update on the engineering committee's
12 activities.

13 MR. FRANCO: I will just note that the
14 engineering committee met this morning to finalize the
15 engineering committee report. A final version of that
16 engineering committee report has been signed by all
17 three states, and we have paper copies distributed to
18 each of the states. We have a PDF document -- or a PDF
19 containing all the attachments to that engineering
20 committee report that's been distributed as well.

21 I think, for purposes of this meeting, I will
22 just read the executive summary into the record.

23 "The engineering committee met four times
24 since last August's Republican River Compact
25 Administration annual meeting. Over the past year, the

1 engineering committee completed these assignments:
2 Holding quarterly meetings and exchanging information
3 listed in Section V of the RRCA Accounting Procedures
4 and Reporting Requirements, including all required data
5 and documentation, and also drafting a letter to the
6 USGS to discuss finalized gauge data by April 15 of each
7 year.

8 Ongoing assignments include, one, continuing
9 efforts to resolve concerns related to varying methods
10 of estimating ground and surface water recharge and
11 return flows and related issues; No. 2, continuing to
12 finalize accounting for 2006 through 2015; three,
13 working to resolve issues preventing agreement on final
14 accounting for 2006 through 2014; No. 4, discussing
15 developing an application and approval process for
16 future augmentation plans; No. 5, exploring options for
17 sharing evaporation charges for Harlan County Lake;
18 No. 6, assign responsibility for collecting specific
19 fields of data collected for the annual data exchange;
20 No. 7, create a document memorializing when RRCA
21 accounting procedures have changed over the years and
22 incorporating it into the accounting procedures.

23 The engineering committee recommends
24 discussion by the RRCA on the exchange of data and
25 documentation and modeling runs completed by Principia

1 Mathematica for 2015, discussion of Nebraska's proposal
2 to revise the RRCA Accounting Procedures and Reporting
3 Requirements, and the recommended engineering committee
4 assignments for the following year.

5 So with that, I think I will just open it up
6 for questions, if anyone has any. I think that
7 concludes the engineering committee's update.

8 COMMISSIONER WOLFE: And then when we get
9 to -- we will take actual action on the engineering
10 committee report under agenda item 8. We can highlight
11 maybe some of the recommended assignments that we have
12 tasked the engineering committee, so we can do that at
13 that time. So this was just an update on their
14 activities.

15 So hearing no other questions on that, we
16 will go on to agenda item 7 under Old Business. The
17 first item is the Status of Unapproved Previous
18 Accounting.

19 The engineering advisers committee is
20 continuing to work on this, and there's been a number of
21 reasons why we have not been able to approve some of the
22 previous accounting. As you will hear today, with the
23 action of some of our resolutions that are trying to
24 bring closure to some of the longstanding unresolved
25 issues in regards to, particularly, Nebraska and

1 Colorado's ongoing efforts with compact compliance, we
2 couldn't take official action on some of those until
3 some of these issues were resolved.

4 And so we think, as a result of these actions
5 under these resolutions today and other discussions that
6 we have been undertaking this past year, that the
7 engineering committee can move forward and try to bring
8 to closure a number of those years on the accounting.

9 They are going to be working on that over
10 this upcoming year, and we have tasked them specifically
11 to work on various aspects of that by the end of 2016,
12 and then, of course, for further action by the RRCA at
13 that time and then anticipate at our next annual meeting
14 as well. So are there any other questions or discussion
15 in regards to that agenda item?

16 All right. Agenda item 7(b). In regards to
17 the Status of Report and Transcripts for 2014 Annual
18 Meeting and Prior Special Meetings, again, this was
19 added to the original agenda that was published out
20 there. As we indicated at the beginning of this
21 meeting, we added this.

22 This is something we need to take action on,
23 and the engineering advisers have provided us that
24 report. And what's included as part of that report are
25 the transcripts from the 2014 annual meeting and any

1 prior special meetings, are all included in that. And
2 so at this time I would entertain a motion to approve
3 that report including those documents.

4 COMMISSIONER BARFIELD: I would move that we
5 adopt the -- approve the annual report for 2014 and all
6 of its parts.

7 COMMISSIONER FASSETT: Second.

8 COMMISSIONER WOLFE: A motion and a second.

9 Any other discussion? All those in favor say aye.

10 COMMISSIONER FASSETT: Aye.

11 COMMISSIONER BARFIELD: Aye.

12 COMMISSIONER WOLFE: Aye. Motion approved.

13 The next order of business is our New
14 Business. And so I'll first take up just an initial
15 discussion on agenda item 8(a) in regards to the Three
16 States Discussions.

17 Again, we are not -- this was just left on
18 here to maybe give each of the three Commissioners just
19 a brief opportunity to, I guess, highlight what we have
20 been involved with between our three states,
21 particularly over the last couple years at least, where
22 we have been having ongoing monthly meetings rotating
23 between the three states.

24 And even though the three states have been
25 working with each other for many, many years in regards

1 to our Republican River efforts, even before I got on
2 board for Colorado, we wanted to just highlight this
3 particular process. It really started in earnest --
4 and, again, Commissioner Barfield highlighted some of
5 the people he recognized from Kansas that really have
6 gotten engaged in our activities in the last couple
7 years.

8 I know Secretary McClaskey, after she joined
9 as the Commissioner of Agriculture there, really got
10 engaged in this process. And her staff, along with
11 Commissioner Barfield and his staff, who've already been
12 actively involved in those discussions, but also got
13 Director Streeter from the Kansas Water Office and his
14 staff involved as well, and individuals from their
15 Attorney General's Office.

16 And we have been actively engaged in monthly
17 meetings since that point in time. And I really have to
18 compliment Kansas, particularly, for committing those
19 kind of resources to it. And I know Nebraska has
20 likewise committed a lot of resources with their staff,
21 and representatives from the Platte Water Group have
22 been instrumental in part of these ongoing discussions.

23 So we just wanted to quickly take this
24 opportunity to highlight those activities. Certainly we
25 will talk in more detail when we get to the actual

1 resolutions which are really the results and the fruit
2 of those efforts over the last couple years.

3 But I certainly wanted to compliment my staff
4 for their tenacity and perseverance through all of this
5 in supporting us to getting to this point. We certainly
6 couldn't have done it without them. So I appreciate
7 that. So I would like to just open it up to each of the
8 Commissioners if you want to provide some additional
9 comments as well. Commissioner Barfield.

10 COMMISSIONER BARFIELD: Thank you, Chairman
11 Wolfe. And, yes, I would like to add a few remarks,
12 just of a general nature, and then we'll get into the
13 specifics of the two resolutions that have been the
14 fruit of this labor later.

15 This is really, without being overly
16 dramatic, an historic day for this compact
17 administration, among the most historic, I think, that
18 we have had. Certainly not the only one, but this is a
19 big deal.

20 Two years ago we had just completed our fifth
21 arbitration over a two-year period of just disputing
22 about really these augmentation projects and other
23 compliance activities and how they should be done and
24 under what conditions they should be done. And at the
25 conclusion of the last of those five arbitrations, the

1 states decided, Let's work together in a different way,
2 and started these discussions that, Dick, you just
3 mentioned.

4 They've been very active. You mentioned the
5 word "tenacious." I think all three states have been a
6 bit -- have come to the table with the people that
7 needed to be there and extended a lot of work, listened
8 a lot. And we have had some tough points, but I think
9 the agreements we are going to sign today allow us to
10 move forward in a new way.

11 For our part we wanted to make sure that your
12 compliance activities, which are very significant -- and
13 we recognize that -- but to make sure they benefited our
14 water users to the extent it could be allowed with
15 Colorado.

16 We wanted to make sure our South Fork water
17 users were getting the amount of water that they were
18 entitled to under the compact. So we have, like you
19 all, worked hard to those ends. And, again, I think --
20 I think we have been very successful.

21 As Dick mentioned earlier, we had a series of
22 short-term agreements that have been very helpful in
23 these recent years to allow us to explore ways that
24 these projects could be worked. And this last year we
25 have really focused on how to make these into long-term

1 agreements, and we'll cover those today.

2 Our work is not over. Again, as Mr. Fassett
3 mentioned, we've still got work to do among ourselves as
4 states and work with our water users.

5 But I think we have a lot -- a good
6 foundation and a lot better working relationship so we
7 can be successful as we move forward. So I will stop
8 there with sort of the general remarks and comment more,
9 maybe, specifically on the two specifics after your
10 comments.

11 COMMISSIONER WOLFE: Thank you, Commissioner.
12 Commissioner Fassett.

13 COMMISSIONER FASSETT: Thank you. I agree
14 with everything that you both said. I think, as the new
15 player to this mix, I arrived after the litigation,
16 after the five arbitrations, after all the fun and games
17 that the states have been through.

18 And I'm not looking for sympathy. I
19 volunteered for this job. But it was quite a year of
20 trying to catch up on some incredibly complicated issues
21 that had such long histories. And certainly I have a
22 fabulous set of advisers to keep us on the straight and
23 narrow, but I am continuing to learn.

24 But as part of that, I think we -- I
25 uniquely, I think, spent a lot of time -- while not

1 everybody agrees with everything we are doing -- we
2 spent a lot of time trying to develop relationships
3 internal to the State with a new director of the
4 Department of Natural Resources.

5 And part of that included the Bureau, and I
6 know Mr. Scott expressed some frustrations about the
7 draft resolution, but we've had three or four major sets
8 of meetings in the past year with the Bureau of
9 Reclamation trying to work through these issues.

10 And it is a sequence, has really been our
11 point. I think we, as states, have just simply had to
12 come together. It is a compact that allocates waters to
13 us. And so we do have the initial responsibility to
14 establish the framework upon which all other water
15 administration, accounting actions, and water rights
16 administration is going to occur.

17 And some people don't like that, but that's
18 where we are and that's what we needed to do, and I
19 think we have made great progress in at least the
20 additional year that I have been a party to the dialogue
21 that got started so much longer ago. And certainly,
22 from my experiences in other states, the process we have
23 undertaken is the better process.

24 The litigation routes, even the arbitration
25 routes, are very difficult, very cumbersome. I have

1 been there in other river basins, and those are very
2 messy places to really roll up your sleeves and work
3 through language like we have together in this past
4 year.

5 So it is a sequence. We are going to be
6 engaging our users. We are going to be engaging the
7 water managers across the basin in all of our states as
8 we go forward, but I think, in my view, it has simply
9 just been required that the states have had to grind
10 through to get where we are, to get this initial step
11 set, or we will never be able to get through the rest of
12 the details that are going to come.

13 And so, as the newer guy to your team here,
14 it's been a wild experience and we have spent more time
15 together than we probably ever wanted to, but I think
16 that's what it's taken. We've rebuilt relationships
17 that are now going to last through, I think, other
18 difficult stuff that's ahead before we get these things
19 concluded. So thank you.

20 COMMISSIONER WOLFE: Thank you, Commissioner.

21 I, again, would like to just highlight what
22 Commissioner Fassett and certainly Commissioner Barfield
23 indicated as well about this building relationships.

24 I think that's one of the things where we
25 convened this meeting and said, Let's put down the

1 swords and figure out a better path forward. And we
2 recognized we all had a common interest and goal in
3 representing our respective users in our states and we
4 talked about trying to build this through collaboration
5 and building consensus.

6 One of the things I've learned coming away
7 from this is, in the state that we are in now and the
8 technology, it's so easy, with previous communications,
9 to communicate through e-mail and -- we didn't get to
10 the point of using Tweets and some of those other
11 things, or Facebook -- but what was so important in
12 building this relationship is, we dropped down sending
13 the e-mails, we got together face-to-face and talked.

14 And that's really what was so important. And
15 if there's anything I can pass on as a recommendation,
16 users in our respective basins are faced with conflict
17 in dealing with these difficult issues, and it takes
18 time and effort, but you've really got to sit down and
19 talk to each other face to face.

20 That's the only way I have found personally
21 to build these relationships, to build towards
22 consensus, that ultimately, I think, as a result of
23 where we ended up last night of seeing a compromise that
24 we could all live with and move forward.

25 Because we know nothing we do is perfect and

1 it's not a perfect world we live in, but we came to a
2 good point. And so I just wanted to highlight that.

3 And I hope we continue to build on that model
4 going forward, and our successors many years into the
5 future. So thank you all for making that happen, and,
6 hopefully, folks will hear from our discussion of our
7 resolutions that are upcoming that they bear the fruit
8 of those efforts.

9 The first action I would like to take up
10 under agenda item 8(b) is an Action on Engineering
11 Committee Report and Assignments. We had a good
12 discussion on that agenda item this morning as part of
13 our workshop and work sessions, so you should all have
14 an updated version of that report with completed action
15 items and recommendations that the Commissioners are
16 tasking the engineering advisers with in the upcoming
17 year.

18 So at this time I would turn it over to
19 either one of the Commissioners or the engineer advisers
20 if you want to provide any other comments in regards to
21 that.

22 Are there any questions or comments on that?
23 We are not going to read anything into the record. It
24 will be posted on our, hopefully, newly-to-be-released
25 website that we've talked about. So thank you, Chelsea.

1 COMMISSIONER BARFIELD: Yes, I think we have
2 agreed to the assignments. I think they are reflected
3 in the engineering committee report. I guess I would
4 move that we assign the engineering committee the 11
5 tasks that are included within their report for the
6 coming year.

7 COMMISSIONER FASSETT: I will second that.
8 Is it only 11? Just kidding. I will second the motion.

9 COMMISSIONER WOLFE: There's been a motion
10 and a second. Any other discussion on that agenda item?
11 All those in favor signify by saying aye.

12 COMMISSIONER FASSETT: Aye.

13 COMMISSIONER BARFIELD: Aye.

14 COMMISSIONER WOLFE: Aye. Motion approved.
15 Thank you.

16 We are to agenda item 8(c). And as I
17 indicated before, I'll see if I can manage getting
18 through this. This should be three separate actions,
19 but I will just read the title of this resolution and
20 then we can take action on it and then we will take an
21 additional two actions on the associated documents.

22 But this is a Resolution of the Republican
23 River Compact Administration Regarding Required Changes
24 to the RRCA Accounting Procedures and Reporting
25 Requirements Regarding Non-Irrigation Season Canal

1 Diversions for Groundwater Recharge Purposes.

2 So, Jennifer.

3 MS. SCHELLPEPER: Would you like me to
4 briefly describe what this is about?

5 COMMISSIONER WOLFE: If you could, please.
6 Thank you.

7 MS. SCHELLPEPER: For the past year or so, we
8 have been working on this in the engineering committee,
9 and it was just to look at the diversion of flows in a
10 non-irrigation season that would be for the purposes of
11 groundwater recharge and to look at the evaporation
12 rates and what returns to the stream from those
13 activities.

14 We recognized that the irrigation season and
15 non-irrigation season would have different evaporation
16 rates, and so we undertook a study to look at that over
17 a prior 10-year period to split those proportions up and
18 then to adjust the accounting for the non-irrigation
19 season so that it would reflect that changed evaporation
20 rate and return to the streams.

21 And so associated with the resolution then,
22 as you mentioned, are changes in the accounting
23 procedures and changes to the rules and regs to
24 recognize the new accounting procedures with the new
25 dates.

1 And all of the attachments and the
2 engineering committee report would include the
3 memorandum that we sent dated July 7 to the engineering
4 committee members for review of more details of all the
5 accounting procedures and what we did. Any questions?

6 COMMISSIONER WOLFE: Any questions for
7 Jennifer? Hearing none, I'd entertain a motion to
8 approve this resolution.

9 COMMISSIONER FASSETT: I move adoption.

10 COMMISSIONER WOLFE: Second?

11 COMMISSIONER BARFIELD: I second.

12 COMMISSIONER WOLFE: A motion and a second.
13 Any other discussion? All those in favor signify by
14 saying aye.

15 COMMISSIONER FASSETT: Aye.

16 COMMISSIONER BARFIELD: Aye.

17 COMMISSIONER WOLFE: Aye. Motion approved.

18 As Jennifer had mentioned, as a result of
19 this resolution, there's changes to the RRCA Accounting
20 Procedures and Reporting Requirements that will be
21 enacted for accounting years 2016 going forward.

22 So unless there's any questions on that, I
23 entertain a motion to approve those reporting accounting
24 procedures and requirements dated as of today.

25 COMMISSIONER BARFIELD: I would so move that

1 we approve the accounting procedures that have been
2 revised with the date August 24, 2016.

3 COMMISSIONER WOLFE: Second?

4 COMMISSIONER FASSETT: I would second.

5 COMMISSIONER WOLFE: There's been a motion to
6 second. Any other discussion? All those in favor,
7 signify by saying aye.

8 COMMISSIONER FASSETT: Aye.

9 COMMISSIONER BARFIELD: Aye.

10 COMMISSIONER WOLFE: Aye. Motion approved.

11 The last item that relates to this, as
12 Jennifer indicated as well, due to these changes, we had
13 to update our Rules and Regulations for the Republican
14 River Compact Administration. And they have been
15 revised to reflect these changes and are dated
16 August 24, 2016, and you should all have a copy of those
17 before you that reflect those changes.

18 Are there any questions in regards to those
19 changes?

20 COMMISSIONER FASSETT: I believe they are in
21 order and I would move adoption of those changes.

22 COMMISSIONER WOLFE: There's been a motion.

23 COMMISSIONER BARFIELD: I would second.

24 COMMISSIONER WOLFE: A motion and a second.

25 Any other discussion? Hearing none, all those in favor

1 signify by saying aye.

2 COMMISSIONER FASSETT: Aye.

3 COMMISSIONER BARFIELD: Aye.

4 COMMISSIONER WOLFE: Aye. Motion approved.

5 Thank you.

6 We are on to the next agenda item. This is
7 in regards to agenda item 8(d), Resolution Approving
8 Colorado's Resolution Dated August 24, 2016.

9 Let me first just read the title of this
10 resolution. I am not intending to read the resolution
11 into the record. It will stand as part of the record
12 from today.

13 But this is a resolution by the Republican
14 River Compact Administration Approving Operation and
15 Accounting for the Colorado Compact Compliance Pipeline
16 and Colorado's Compliance Efforts in the South Fork,
17 Republican River Basin.

18 And certainly we have talked a lot about
19 this. I'm proud to announce not only this historic
20 agreement but the one that will follow that Commissioner
21 Fassett will introduce on behalf of Nebraska.

22 I believe this is the first time since
23 signing of the compact that the three states have worked
24 together to resolve our issues without litigation, and
25 we have brought, I think, certainty to the water users

1 within the basin with these two resolutions that we are
2 bringing forward.

3 And I would first like to, before I get into
4 maybe just some comments about what's contained in the
5 resolution in just a high-level way without reading it
6 in detail, but I would like to -- certainly we couldn't
7 have gotten here -- we've mentioned all of the folks who
8 have been involved in getting us to this point.

9 I'd like to just take this time because of
10 all the effort that has gone into this by a lot of
11 people over the years. I'd be remiss in not
12 specifically recognizing some of those individuals and
13 their efforts.

14 And certainly first and foremost, on behalf
15 of Colorado and my staff who's assisted me in these
16 efforts -- and you see a lot of them here today --
17 including Mike Sullivan; Scott Steinbrecher, who's here
18 from the Attorney General's Office; Willem Schreuder;
19 Ivan Franco; Chris Grimes, who many of you know as
20 well -- I'm not sure he showed up yet today; I know he's
21 coming out for a meeting later today in the basin but
22 works out of our Denver office -- has been instrumental
23 as well; Dave Keeler, lead water commissioner here in
24 the basin; his staff; Chris Kucera; Devin Ridnour;
25 Breann Ferguson; and Matt Hardesty. Thank you much for

1 all you do within the basin in helping us in our compact
2 compliance efforts.

3 Corey DeAngelis, assistant division engineer,
4 is here as well. He works out of our Greeley office.
5 And I want to thank you, Corey, and all of your staff
6 out of the Greeley office who have also helped us in
7 these efforts.

8 And there's other individuals that I could
9 list as well out of our Denver office, but I'll just
10 collectively thank them in terms of their efforts.

11 Also we've had Commissioner Don Brown who has
12 joined our efforts in this past year. Commissioner
13 Brown lives within the Republican River Basin, and I
14 believe he's been very instrumental in working on a
15 level with Secretary McClaskey in terms of not only
16 these efforts but just the common interest we see
17 between our three states within the basin.

18 We know and recognize water touches
19 everything, but they certainly have looked at this in a
20 broader perspective in looking towards longer-term
21 things that we can work towards as three states. But
22 they knew we needed to get these issues resolved around
23 the water and that provided a great foundation to move
24 forward. So we thank him for his efforts.

25 John Stulp, a special water adviser to

1 Governor Hickenlooper, also has roots in this basin as
2 well and has been instrumental in our efforts working
3 with us in developing this long-term agreement.

4 And other members, Scott, of your staff at
5 the Attorney General's Office I know have been involved
6 in not only these efforts but other activities within
7 the basin. They are certainly important.

8 I would like to recognize the Republican
9 River Water Conservation District, certainly their
10 board -- Rod Lenz, their president, and all the board
11 members; Deb Daniel, who's here today as well; and staff
12 members and their legal counsel. Pete Ampe is here as
13 well, along with David Robbins, who has worked in
14 assisting the district working with Colorado.

15 This district was created in 2004 and has
16 been very instrumental in helping Colorado get to this
17 historic moment in achieving compact compliance and
18 moving forward for many years into the future.

19 I certainly want to recognize Nebraska, Jeff,
20 and your staff and what they have done in getting us to
21 this point. I know you had some predecessors before you
22 that -- Brian and others that preceded you in these
23 efforts -- but I want to thank all of your staff for
24 that, including the Flatwater Group, and Tom Riley and
25 your staff for what you have done, and Justin Lavene at

1 the Attorney General's Office and all of your staff and
2 what they have done. And I know there's been other
3 outside counsel, Tom Wilmoth and Don Blankenau as well.

4 I have appreciated their commitment, all the
5 states' commitments to dedicate the resources
6 separately. It's not been cheap. And we know, with
7 limited resources that each of our states have, it takes
8 a lot of time, not only just money, to support those
9 efforts, but the extra hours I know that all of these
10 folks have put in to get us to this point.

11 Kansas, of course, certainly have appreciated
12 your efforts over the years. And I recognize Secretary
13 McClaskey and her staff coming in and Director Streeter
14 and the Kansas Water Office, and certainly Secretary
15 McClaskey and her efforts, and the AG's office. I know
16 Wendy Grady and some of the folks that came before with
17 Burke Griggs and Chris Grunewald and their efforts have
18 led us up to this point, so thank you.

19 And, lastly, before I get into the points
20 about the resolution, we all know that we have our
21 respective roles as public servants in getting these
22 documents and trying to achieve compact compliance, but
23 we know it affects the water users in our basins and
24 that's who we are representing.

25 And I want to thank all of the users who have

1 participated in various public meetings we've had and
2 the input you've provided to us and the guidance working
3 on this and, particularly, in Colorado the local
4 groundwater management districts, their boards, and the
5 Yuma County water users and their efforts and CAPA, the
6 Colorado Agriculture Preservation Association I know has
7 been very active in these efforts as well.

8 So thank you all. And I know that each of
9 the states have been doing it as well on behalf of their
10 water users, ensuring that they are entitled to what the
11 compact provides for them, and that's what we have been
12 working to achieve at this point.

13 So let me just take a moment to capture what
14 I think are some of the salient provisions within the
15 resolution. The first part of this under Section A
16 talks about the approval of the operation accounting for
17 the compact compliance pipeline.

18 As I have indicated, this is our third year
19 of operation under the annual approvals, but this
20 long-term agreement will allow Colorado to get
21 one-for-one credit for the measured outflow. That's a
22 change from these prior three years.

23 The outflow from that pipeline no longer is
24 included in the groundwater model. So it reduces our
25 pumping requirement going forward compared to these

1 temporary approvals in the last three years.

2 In exchange, Colorado agrees, through CREP
3 and other voluntary programs, to remove from irrigation
4 25,000 additional acres by 2027. The states also agree
5 to meet and discuss several other issues over the next
6 year.

7 I guess one of the points we recognize and I
8 want to highlight in this resolution is, we are trying
9 to provide certainty yet provide as much flexibility to
10 the water users in each of the states in trying to
11 achieve compact compliance because we know it's not a
12 one-size-fits-all.

13 There's a lot of activities going on in terms
14 of our overall compact compliance efforts, and we think
15 this long-term agreement allows for that, certainly as
16 well as the flexibility moving forward.

17 So the three states also agree to meet and
18 discuss several other issues over the next year. One of
19 those is in regards to Bonny Reservoir. As you know, I
20 issued an order in 2011, September 2011, to drain Bonny
21 Reservoir. It was a very difficult decision, but it was
22 a step that Colorado felt it needed to take in terms of
23 our overall compact compliance efforts.

24 But we've never lost focus on potential
25 opportunities going into the future, if they were so

1 permissible, to store water in Bonny Reservoir. We know
2 it's a great recreational fishing site. And part of
3 this agreement -- we will continue those discussions.

4 It doesn't commit us to anything, that we are
5 going to store water in Bonny Reservoir, but we are
6 going to look at what provisions, what opportunities, if
7 water does become available in there, how can we go
8 forward and allow Colorado, particularly, to remain in
9 compact compliance.

10 Secondly, a water-short year accounting. We
11 also are going to continue discussions on that. That's
12 been one of the sticking points that we have discussed
13 over time, and we have worked through this agreement to
14 recognize that we have got some more work to do on that,
15 but we are going to continue between the three states.

16 As Commissioner, I've agreed to work with the
17 parties that are authorized and obligated to manage
18 Bonny Reservoir in order to maintain the flows of the
19 reservoir.

20 And, of course, this is all important in all
21 our streams to achieve compact compliance. And so we
22 made a commitment to work with the three states and the
23 individuals -- entities identified in the resolution.

24 But that provision is not intended to create
25 or alter the rights, views, or obligations of any of the

1 groups named in that provision. This is Colorado's
2 efforts to try to work with those entities, as we can,
3 in terms of compact compliance efforts.

4 Importantly, the states agreed that
5 compliance with the resolution constitutes compliance
6 with final settlement stipulation and the Republican
7 River Compact. In other words, the actions and benefits
8 that accrue under this resolution are protected during
9 and after the agreement.

10 It's our intent that the agreement will go
11 on indefinitely, but it may be terminated by one of the
12 states by providing notice two years prior to the
13 termination. And this is a provision that's both in
14 Colorado's resolution as well as Nebraska's, and
15 Mr. Fassett may certainly highlight that as well.

16 And we have worked, as I have indicated, with
17 the Republican River Water Conservation District to
18 ensure that Colorado, with the help of the district, can
19 meet the goals to retire acreage using these voluntary
20 programs.

21 We recognize these are voluntary programs and
22 that it will take the efforts of the district and
23 Colorado end users, but we recognize there's other
24 efforts that may also be undertaken, conservation
25 efforts, that have been discussed that may also help

1 achieve us to get to those same goals.

2 And we understand at this point that the
3 Republican River Water Conservation District supports
4 this resolution that I am going to introduce today.

5 Overall, the resolution provides certainty
6 for water users in all three states. For Colorado water
7 users particularly, it allows them to plan for the
8 future, knowing that the CCP will continue to operate
9 each year and encourages the water users to start
10 planning for long-term and to seriously consider whether
11 to continue their current levels of irrigation.

12 We know that meeting the voluntary acreage
13 goals will take significant effort and serious
14 commitment from water users in the Republican River
15 Compact Administration, but we believe these voluntary
16 programs under this agreement will benefit Colorado
17 water users more than if I began curtailing wells to
18 meet the compact obligations.

19 We have made it very clear this is the
20 preferred path forward. We want to maintain a very
21 viable ag community out here. And I did not want to
22 have to initiate any actions that would immediately have
23 to take efforts to curtail wells in the basin, so we
24 believe this resolution provides that certainty.

25 That they can, through these voluntary

1 efforts and others that may be identified as we move
2 forward over the next several years, to help Colorado
3 achieve compact compliance.

4 So at this time, unless there's any other
5 comments or questions on that, I would certainly move to
6 adopt this resolution that I indicated by title dated
7 today.

8 COMMISSIONER BARFIELD: I second that.

9 COMMISSIONER WOLFE: There's been a motion
10 and a second. Is there any other discussion or comments
11 that either Commissioners would like to make at this
12 time regarding this specific resolution?

13 COMMISSIONER BARFIELD: I would like to make
14 a few comments.

15 COMMISSIONER WOLFE: Please.

16 COMMISSIONER BARFIELD: I think Colorado
17 first introduced the idea of the CCP in early 2008, I
18 believe it was. And the states of Colorado and
19 Kansas -- Nebraska's been part of the discussion over
20 this last year, but I think most of the discussion has
21 been -- prior to that has been between the two states.

22 We have spent -- I have no idea how many
23 meetings and phone calls, hours we have discussed and
24 arbitrated and worked through this issue. So it's a
25 pleasure today to get to this agreement.

1 Colorado has -- and we recognize they have
2 taken a lot of action to get to compliance, both
3 statewide and specifically on the South Fork of the
4 Republican River that flows through Kansas, and we have
5 recognized that those actions have been significant.

6 We haven't felt like they've got you all the
7 way, and the states, through some work this last year,
8 have sort of come to the conclusion that the retirement
9 of these additional acres will get you to compliance.

10 So we have seen the South Fork of the
11 Republican Basin that a lot of our water users depend
12 upon, its condition is significantly improved. And we
13 appreciate the past activities and look forward to the
14 additional activities that will ensure that our water
15 user get the water they are entitled.

16 So we are pleased to be able to support this.
17 I think Dennis Coryell has come -- I don't know how many
18 years he has come here and urged us to get to compliance
19 in the remarks at the end of this meeting. So I am
20 hopeful that today's remarks, if Dennis gets to the
21 table during the public comment period, will maybe be of
22 a different nature.

23 He's always been very friendly. I am not
24 saying that. But just urging us to get it done, to get
25 to agreement. And for the short-term agreements, he

1 said, Thank you for the short-term agreements, but
2 please let's get to a long-term agreement.

3 So it's a pleasure to be here today.

4 COMMISSIONER WOLFE: Thank you, Commissioner
5 Barfield.

6 And if the rumors are true, Dennis indicated
7 that, if we reached this point today, he was going to
8 retire from all of this. So I think he's going to take
9 a permanent vacation, so we'll maybe hear from him later
10 if he has any additional comments.

11 It wouldn't go without having Dennis give
12 some comments today, so I am giving you a cue, Dennis.

13 Commissioner Fassett, would you like to add
14 anything to that?

15 COMMISSIONER FASSETT: Yes, just real
16 briefly. First, we would offer our congratulations to
17 you both. As we've witnessed many of the discussions on
18 issues that weren't directly related to Nebraska, we
19 know how tough those were. And part of the time we were
20 excused from the room and that was okay.

21 But certainly the CCP is an important project
22 for Nebraska to help us. Your compliance helps us as
23 much as it does Kansas. So, again, we are very pleased
24 to be here and participate and look forward to this
25 motion.

1 COMMISSIONER WOLFE: Thank you,
2 Commissioners. All those in favor signify by saying
3 aye.

4 COMMISSIONER FASSETT: Aye.

5 COMMISSIONER WOLFE: Aye.

6 COMMISSIONER BARFIELD: Aye.

7 COMMISSIONER WOLFE: Motion approved. Thank
8 you.

9 Next on the agenda is agenda item 8(e).
10 Commissioner Fassett.

11 COMMISSIONER FASSETT: Thank you,
12 Mr. Chairman. Before you is really building upon one
13 year's resolutions that we brought through and even some
14 amendments to those resolutions over the past three
15 years. We bring before you a resolution approving
16 long-term agreements related to the operation of Harlan
17 County Lake for compact call years.

18 It is still narrowly associated -- the
19 provisions of this resolution are narrowly associated
20 with the compact call year scenario.

21 Like you, I think we would not be here, as I
22 mentioned earlier as the new director and new
23 Commissioner to this body and the long-term nature of
24 the difficulties these three states have had.

25 I inherited a great group of legal and

1 technical and policy advisers as well as our regulatory
2 partners in surface and groundwater management through
3 our Natural Resource District.

4 And so I, just like you did, I really want to
5 acknowledge and thank them for all of the work and the
6 input and advice that I had in working through these
7 difficult issues with the states. And so while there's,
8 again, a lot of heavy lifting to go, I think we are real
9 pleased and will accept this one, hopefully, with an
10 action today and move on.

11 Long before I got here -- and I certainly
12 agree that the states, I think, as you said,
13 Mr. Chairman, have really agreed to try to step away
14 from a more controversial environment to look for ways
15 to create flexibility for our water users -- at the end
16 of the day, that's what really matters -- wherever we
17 can to maximize the beneficial use of the waters that we
18 are each allocated. And that sort of theme is buried in
19 this resolution as it is with the one we just passed and
20 so many of our actions.

21 These past years -- all water short, all
22 compact call years the last three years -- the one-year
23 agreements that we have had have had some success.

24 We've expected and modified the operations
25 that allowed for a cleaner, more predictable

1 administration of water administration that was unlike
2 what we had before. And we have come through some very
3 difficult transition years as we began to use
4 augmentation projects and had to also use some very
5 heavy-handed regulation in the past in order to meet our
6 compact obligations.

7 As you know, we're in the midst of some
8 litigation related to some past actions going back to
9 the years of '13 and '14, and those are continuing to
10 override some of the matters here today. But this
11 resolution, we think, will really push things forward.

12 So I think, working with you all for the past
13 year, building on the past resolutions that the compact
14 administration has adopted, I think we are pleased to
15 have this longer-term arrangement before you today.

16 Very briefly, the key aspects of the
17 resolution here is that it does provide more clearly for
18 early and frequent coordination. In spite of the fact
19 that we've spent a lot of time together, I think we want
20 to put in place a structure that is embedded in this
21 resolution so that, among the states, we have greater
22 dialogue and exchange of information on more detailed
23 information than we have in some of the past.

24 I think we have tried to outline some of that
25 coordination and some deadlines of how we are going to

1 be able to communicate to help us each manage the water
2 we are each entitled to.

3 It clearly provides Kansas some flexibility
4 in the use of the water that they're entitled to under
5 the compact. And that, again, is one of the themes that
6 we are each trying to do for each other in both this
7 resolution and the one we just recently passed.

8 For Nebraska this provides credit. It
9 provides the full credit for the augmentation of stream
10 flows, and our natural resource districts and citizens
11 across the entire basin have invested heavily in those
12 projects, together with some state resources.

13 And those projects have minimized some of the
14 detailed very heavy-handed regulation that occurred in
15 the past. And that is a great benefit to the State of
16 Nebraska, and we want to continue to keep that overall
17 framework on the State's behalf in place.

18 I think we've made the commitment, as we did
19 today, to continue to share information about new
20 projects, whether it's augmentation or new management
21 actions that we implement through our integrated
22 management planning processes.

23 Our NRDs are up to Version 4 of the IMPs, and
24 those are living documents. Those are going to be --
25 continue to be modified and reviewed and updated as

1 those districts feel necessary to continue to manage the
2 groundwater resources in the best manner they feel is
3 appropriate. That couples with the work that the
4 Department of Natural Resource does to get the overall
5 state in compliance. So that sharing of information and
6 that continued attention and commitment is there.

7 Again, as I have already said probably too
8 often today, this really is, in our view, an important
9 first step. The states needed to come together.

10 I look forward to positive action on this
11 resolution so it sets the framework for now us going
12 forward with the districts, with the Bureau of
13 Reclamation, and others in working on the details of
14 implementing things that we have all talked about as
15 states, things that our users are interested in,
16 activities that the states are interested in, which are
17 not within our authorities as this resolution is.

18 And I think at that point we need to invite
19 the other players to the table. And that, I think, is a
20 commitment that's buried in this resolution that's very
21 important.

22 There are great details to come, great
23 dialogue to come, that are going to be just as
24 controversial. But without the states' agreement on the
25 compact allocation accounting and the ramifications of

1 that, I don't think we could get to those next steps.

2 And then, Mr. Chairman, as in the resolution
3 we just passed, there is the language here about
4 termination, the opt-out options, as well as the ability
5 to implement and conform with the compact in accordance
6 with this body. And those are very important provisions
7 that, again, as we all know, just came together
8 yesterday.

9 And so that's really the background for this
10 resolution. Again, it builds on the ones this body has
11 passed before. Unless there's some specific questions,
12 I would like to move the adoption of this resolution.

13 COMMISSIONER BARFIELD: I would second.

14 COMMISSIONER WOLFE: Any discussion,
15 comments? Commissioner Barfield.

16 COMMISSIONER BARFIELD: Yes, I would like to
17 make some comments. And, again, Jeff -- Mr. Fassett --
18 normally I am more formal in these proceedings, but
19 we've spent so much time it's hard not to say Jeff and
20 Dick.

21 But, anyway, I certainly agree with
22 Commissioner Fassett's characterization of the specifics
23 and sort of how we got there and even the work ahead.

24 As he indicated, this resolution does provide
25 a lot more certainty in terms of Nebraska and its

1 internal administration, certainly for Kansas and its
2 water users, particularly the Kansas Bostwick Irrigation
3 District, and especially during these critical
4 water-short years.

5 It also provides a framework that Kansas has
6 some work to do, in order to take advantage of, to
7 provide for additional benefits to our water users -- to
8 all the water users in our main stem Republican River,
9 which we intend to -- that's part of the work that we
10 are going to need to do to continue to use this
11 resolution as a means to improve our water management.

12 One of the paragraphs in the resolution is a
13 commitment for the states to continue to explore ways to
14 seek even greater ability to maximize the benefits of
15 this water. The State of Kansas wants to continue to
16 discuss permanent accounts in Harlan County, as opposed
17 to this accounting only that occurs during water-short
18 years, so we can make the maximum use, again, of our
19 share of the allocation.

20 So, again, just as with the Colorado
21 resolution, we are pleased to support this resolution in
22 its current form and look forward to working with the
23 states as we move forward -- the states and other
24 entities as well. Again, as Commissioner Fassett has
25 said, we now clearly need to involve others in

1 implementing this.

2 COMMISSIONER WOLFE: Thank you, Commissioner
3 Barfield.

4 I would like to acknowledge those comments as
5 well and highlight, if folks didn't have this awareness,
6 these resolutions and the work that's gone up to this, a
7 lot of this discussion has been done under a
8 confidentiality agreement.

9 And we needed that for a specific purpose, to
10 allow us to continue to brainstorm and talk about things
11 without feeling like any of those things would create
12 any unnecessary concern by individuals that we were
13 talking about that in a greater setting.

14 But what we have resulted now and made public
15 through these resolutions, I want folks to understand we
16 have made every effort we can under these resolutions --
17 even though we are acting on them individually, they
18 aren't in isolation. We've tried to make sure that the
19 terms and conditions are in them, that they don't
20 conflict at all in terms of our -- each of our state's
21 efforts, that they really complement each other.

22 And the beauty of that as well is, we do go
23 out and continue our outreach efforts working with water
24 users as we go to implement these. If we come back and
25 realize there's something we've got to fix, if something

1 just isn't working the way we thought, I know that right
2 now, sitting here with the people that are here at this
3 table, that we have a commitment to you to do that.

4 And we think we have built a process in place
5 to do that as we move forward. If there's an issue that
6 we need to address, we can bring it back to this body
7 and discuss it. And, hopefully, if it necessitates
8 adapting to that and making whatever modification is
9 necessary to these resolutions, we are committed to do
10 that.

11 I hope I can speak on behalf of the other
12 Commissioners in that regard. You can certainly comment
13 on that.

14 But I think that's -- I don't want folks to
15 necessarily walk away that these resolutions are like
16 etched in stone like a constitution. They are -- as
17 Commissioner Fassett pointed out, maybe they are not the
18 first step. I think they are about 500 miles into a
19 thousand-mile-journey step of where we are at in this
20 process. But we will continue to adapt and change as
21 necessary.

22 So with that, if there's any comments, if I
23 have misrepresented any of that or mischaracterized it,
24 please say so.

25 COMMISSIONER FASSETT: Mr. Chairman, no. I

1 appreciate that. I am smiling only because it's my
2 first step with you all. I am sure you've had thousands
3 beforehand.

4 I think you raised a good point that I think
5 I had forgotten to mention really. I think in all
6 these -- at least in the Harlan County resolution, there
7 is actually a formal review opportunity.

8 So I think, not only is there a commitment,
9 quite honestly, anytime along the way for us to raise
10 and bring back an issue of something that we think
11 worked but didn't turn out to work, we are going to
12 bring that to you immediately and to try to work through
13 it, as we have.

14 I think we've built a different type of
15 relationship than these three states have had for quite
16 some time, at least as I've been advised.

17 So I think there's actually a formal review
18 in our resolution in 2020, but I think things may come
19 up before then or after that. There is a long-term
20 commitment to not go back to the past procedures and to
21 use the techniques of communication that we have now
22 landed on so firmly and worked for. Thank you.

23 COMMISSIONER WOLFE: Hearing no other
24 discussion, all those in favor of the motion signify by
25 saying aye.

1 COMMISSIONER FASSETT: Aye.

2 COMMISSIONER WOLFE: Aye.

3 COMMISSIONER BARFIELD: Aye.

4 COMMISSIONER WOLFE: Motion approved.

5 That gets us through agenda item 8. At this
6 point we would like to see if there's anyone from the
7 audience who would like to come forward and provide any
8 comments or remarks for the Commission.

9 And I am going to turn this corded mic over
10 to the podium because it seems to be working the best.
11 And so I'll walk around and grab that. So if someone,
12 whoever, wants to come up to the podium.

13 MR. CORYELL: For the record, my name is
14 Dennis Coryell, member of the Republican River Water
15 Conservation District. I don't want to disappoint you
16 today, so -- I congratulate the three states on reaching
17 this agreement. I am not going to pretend to sing
18 Kumbaya for all of this. It took way too long, but
19 we're here.

20 I recognize that both for Nebraska, Kansas
21 and Colorado the main thing that water users in this
22 whole basin want is assurance, knowing what their water
23 right means and that they are going to be able to use it
24 into the future, whether they choose to retire it,
25 whether they choose to continue to irrigate it, whether

1 they choose to conserve the water.

2 And I hope, as you keep moving forward with
3 the negotiations on the rest of the -- especially the
4 South Fork Basin issue, I hope that you will keep those
5 components in mind as you bring everything to a
6 finality. And I hope that that happens soon as well.

7 So thank you for passing the resolution. I
8 would like to mention that, for the record, the
9 Republican River Water Conservation District passed
10 unanimously the resolution that you guys are approving
11 today. So thank you very much.

12 COMMISSIONER WOLFE: Thank you, Dennis.

13 MR. BILLINGER: Rick Billinger, state
14 representative. And I want to thank you guys for
15 working together and getting this done.

16 Two points: One, I am glad to hear you are
17 looking at the possibility of getting water back in
18 Bonny Dam. I can tell you, the people in northeast
19 Colorado and western Kansas would all like to see that.

20 Second point that I hear constantly is, I'd
21 like to see us work on storing this water that we are
22 pumping over here in Colorado in the Ogallala rather
23 than in Harlan County or Trenton. And thank you again.

24 MR. AMPE: For the record, Peter Ampe,
25 counsel for the Republican River Water Conservation

1 District.

2 I just want to follow up on Mr. Coryell's
3 statement. I believe he said that the Republican River
4 Water Conservation District passed your resolution.
5 They passed their own resolution, not your resolution.

6 And just for clarity, I would like to make
7 that resolution from the district part of the record of
8 today's proceedings. I will supply that to the Colorado
9 representative and he can put it into the record, if
10 that's okay with you guys.

11 COMMISSIONER WOLFE: I don't think there's
12 any objection to that. Thank you, Mr. Ampe.

13 MR. EDGERTON: Good afternoon. I am Brad
14 Edgerton with the Frenchman-Cambridge Irrigation
15 District, and I want to applaud you on your efforts. I
16 know that you worked hard on a lot of these issues, and
17 I'd just like to say that the Frenchman-Cambridge water
18 users are patiently waiting for Colorado to be in
19 compliance. We have been for over a decade.

20 We are contracted the water that arrives at
21 Swanson Reservoir, and the water supply out of there has
22 been limited the last few years, to say the least.

23 So we would like you to talk about -- in your
24 discussions in the future, talk about the water that
25 Colorado has used that should have come to Nebraska and

1 look into some kind of compensation for those water
2 users or that.

3 I know we don't want to go down the
4 litigation course, but these water users have been
5 harmed. Colorado has benefited from using this water.
6 So it's important to the water users of the
7 Frenchman-Cambridge Irrigation District that this is an
8 item of discussion. Thank you.

9 COMMISSIONER WOLFE: Thank you, Brad.

10 Others that would like to share remarks?
11 Okay. Seeing none, I guess the next item for action is
12 adjournment. So I'd certainly entertain a motion to
13 adjourn this 2016 annual meeting.

14 Thank you. I'm jumping ahead here. We
15 haven't set a date, but we do keep the annual meeting in
16 each of the states for two years, so this is the first
17 year in Colorado. And we will have one more year in
18 Colorado.

19 We haven't determined whether next year -- it
20 will probably be in August again according to our
21 requirements -- and we will either have it probably in
22 the Burlington area or up in the Wray area, somewhere
23 within the basin. We are committed to continue to hold
24 that, when it is in Colorado, within the basin.

25 And so we will try to get out, as soon as we

1 can, on our new website when that future date will be
2 and its location once we get that location pinned down.

3 So are there any questions about the future
4 meeting date at this time?

5 COMMISSIONER BARFIELD: No.

6 COMMISSIONER FASSETT: No.

7 COMMISSIONER WOLFE: Thank you.

8 Now we are ready for a motion for
9 adjournment.

10 COMMISSIONER BARFIELD: I would move we
11 adjourn.

12 COMMISSIONER FASSETT: Second.

13 COMMISSIONER WOLFE: A motion and a second.

14 All those in favor signify by saying aye.

15 COMMISSIONER FASSETT: Aye.

16 COMMISSIONER BARFIELD: Aye.

17 COMMISSIONER WOLFE: Aye.

18 We are hereby adjourned. Thank you all.

19 (WHEREUPON, the meeting concluded at

20 3:24 p.m.)

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25

1 REPORTER'S CERTIFICATE

2 STATE OF COLORADO)
) SS.
3 COUNTY OF DENVER)

4 I, Denise A. Freeman, do hereby certify
5 that I am a Registered Professional Reporter and
6 Notary Public within the state of Colorado.

7 I further certify that this meeting was
8 taken in shorthand by me at the time and place herein
9 set forth and was thereafter reduced to typewritten
10 form and that the foregoing constitutes a true and
11 correct transcript.

12 In witness whereof, I have affixed my
13 signature this 7th day of September, 2016.

14 _____
15 PATTERSON REPORTING & VIDEO
16 Denise A. Freeman
17 Registered Professional Reporter
18 and Notary Public
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3 Denver, Colorado 80231

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September 7, 2016

IVAN FRANCO, P.E.
Water Resources Engineer
Colorado Division of Water Resources
1313 Sherman Street, Room 818
Denver, Colorado 80203

Dear Mr. Franco:

Re: Transcript of the 2016 Annual Meeting of the
Republican River Compact Administration

Signed, no changes.

Signed, with changes, copy attached.

No signature required.

Reading and signing not requested pursuant to
CRCP Rule 30(e).

Signature waived.

Forwarding original transcript unsigned;
signature pages and/or amendments will be
forwarded, if received.

Original exhibits included in ongoing notebook
and will be filed with counsel at conclusion of
discovery.

Via Email.

**ANNUAL MEETING OF THE
REPUBLICAN RIVER COMPACT ADMINISTRATION**

August 24, 2016

Attendance: Burlington Colorado

Name	Representing
Dick Wolfe	Colorado Commissioner and Chairperson
Scott Steinbrecher	Colorado Attorney General's Office
Ivan Franco	Colorado Division of Water Resources
Mike Sullivan	Colorado Deputy State Engineer
Gordon W. "Jeff" Fassett	Nebraska Commissioner
Jesse Bradley	Nebraska Department of Natural Resources
Justin Lavene	Nebraska Attorney General's Office
Chris Beightel	Kansas Division of Water Resources
Chance Thayer	Flatwater Group
David Barfield	Kansas Commissioner
Jasper Fanning	Upper Republican NRD, Nebraska
Robert Merrigan	Middle Republican NRD, Nebraska
Scott Dicke	Lower Republican NRD, Nebraska
Brad Edgerton	Frenchman Cambridge Irrigation District
Mike Delka	Nebraska Bostwick Irrigation District
Pete Gile	Kansas Bostwick Irrigation District
Chelsea Erickson	Kansas Division of Water Resources
Bob Martin	Republican River Restoration Partners, Farmer
Dave Keeler	Colorado Division of Water Resources
Chris Purzer	U.S. Corp of Engineers
Craig Scott	U.S. Bureau of Reclamation
John Miller	U.S. Geological Survey
Marc Groff	Flatwater Group
Chris Kucera	Colorado Division of Water Resources
Matt Hardesty	Colorado Division of Water Resources
Tim Pautler	Republican River Water Conservation District
Peter Ampe	Counsel Republican River Water Conservation District
Dennis Coryell	Republican River Water Conservation District

Name	Representing
Shane Stanton	Nebraska Department of Natural Resources
Bob Merrigan	Republican Natural Resources District, Nebraska
Scott Dicke	Republican Natural Resources District
Mike Clements	Lower Republican Natural Resources District
Jim Koelliker	Kansas State University, Retired
Ginger Pugh	Kansas Division of Water Resources
Shannon Kenyon	Northwest Kansas Groundwater Management District
Scott Hooker	Local Farmer
Hongsheng Cao	Kansas Division of Water Resources
Randy Hayzlett	Arkansas River Compact Administration, Kansas
Ralph Ostmeyer	State Senator, Kansas
Rick Billinger	State Representative, Kansas
Rachel Duran	Kansas Division of Water Resources
Kevin Salter	Kansas Division of Water Resources
John Thorburn	Tri-Basin NRD, Nebraska
Sam Perkins	Kansas Division of Water Resources
Zablon Adane	Nebraska Department of Natural Resources
Jason Lichty	Local Farmer
Deb Daniels	Republican River Water Conservation District
Dan Stephens	Farmer, Burlington
Dustin Ridder	Farmer, Burlington
Gary Mulch	Farmer, Burlington
Carol Flaute	Nebraska Department of Natural Resources
Tony Mangus	CAPA Boardmember
Bethleen McCall	CAPA
Dennis Wieser	CAPA, Farmer Colorado
Kenny Helling	Arikaree Groundwater Management District
Rod Mason	Arikaree Groundwater Management District
Corey DeAngelis	Colorado Division of Water Resources
Brandi Baquera	Plains Groundwater Management District
Ted Tietjen	Republican River Restoration Partners
Brian Rosene	Kansas Farmer
Tony Leighty	Stratton Equity Co-op
Mark Cure	Colorado Farmer
John Caraday	Private Citizen
Tom Jackson	Colorado Farmer
Devin Ridnour	Colorado Division of Water Resources
Breann Ferguson	Colorado Division of Water Resources

Name	Representing
Willem Schreuder	Principia Mathematica
Jennifer Schellpeper	Nebraska Department of Natural Resources
John Grothaus	U.S. Corps of Engineers – Kansas City District
Thomas Perks	Nebraska Department of Natural Resources
Christie Zirts	Republican River Restoration Partners
John Stewart	Citizen of Burlington, CO
Baey Fioze	MFeddem
Joedy Hartman	Farmer
Troy Tagmeyer	Stratton Equity Co-op
Cory Hatfield	Farmer
Chase Cartin	Banker
Brad Yahn	Farmer
Brandon Hays	Banker
Troy Hinkhouse	Banker
Tyson Reets	Land Broker
Denis A. Freeman	Court Reporter

Republican River Compact Administration – Annual Meeting Attendance Sheet

August 24, 2016

Location Burlington CO

Name – Please print legibly	Affiliation/Group
Chris Beightel	Ks. Dept. of Agriculture - DWR
David Bassfield	Ks. Dept. of Agriculture - DWR
Dike Wolfe	Colorado Division of Water Resources
Van Franco	Colorado Division of Water Resources
Mike Sullivan	Colorado Div of Water Resources
Willem Schreuder	Principia Mathematica
Scott Steinbrecher	Colorado Attorney General's office
JEFF FASSETT	NEBRASKA - DEPT. OF NAT. RESOURCES
Jennifer Schellpeter	Ne DNR
John Corothaus	Corps of Engy - Kansas City District
Brad Edgerston	Franchman Cambridge Inn. Dist.
Shane Skerbin	NDNR
Thomas Perks	NDNR
Chance Thayer	The Nature Group
Mike Clements	LRNRD
Scott Dick	LRNRD
Marc Graff	TFG
Peter Anya	Walt F. Robinson, P.C.
Charles Zambra	RRRP
Rachel Buran	Ks. Dept of Agriculture - DWR

Republican River Compact Administration - Annual Meeting Attendance Sheet

August 24, 2016

Location Burlington CO

Name - Please print legibly	Affiliation/Group
Dave L Keeler	DWR
Jasper Fanning	Upper Republican Natural Resources Dist.
Sharon Thompson	GWRD 4
John Harbom	Triin-Basin NRD - Holdrege NE
Kevin Salter	KS Dept of Ag / Dev Water Resources
Rod Madson	AG-WMD
Jesse Baskin	The Flintwater Group
Mike Della	Pastwick Irr. Dist. in NE
Dan Stephens	Kanmor St. Francis KS
Brandi Baquero	Pains Ground Water Management District
Chelsea Erickson	KDA-DWR
John Stewart	Citizen Burlington CO.
Bethleen McCann	CIAPA City of Yuma, Yuma Conservation Dist
Ginger Pugh	KDA-DWR
Jim Koelliker	KSU-Manhattan, Retired
Robert Merrigan	MRNRD
Randy Hayslett	KANSAS KWA
Greg Scott	U.S.B.R.
Bobby Froese	AM Federa
Mark Wille	Farmer

Republican River Compact Administration – Annual Meeting Attendance Sheet
 August 24, 2016

Location Burlington CO

Name – Please print legibly	Affiliation/Group
Dennis Wieser	Farmer
Joedy Kartman	Farmer
Christopher Purzer	US Army Corps Engineers
Curtis	LPR
Tommy Hoyleby	Shutler Coop
Troy Tostroyek	Shutler Coop
Cory Hatfield	Farmer
Jason Lichty	Farmer
Robert Martin	Farmer
KEP TIEJER	RRRP
DUSTIN RIDDER	FARMER
Ivan Sackison	Farmer
Chase Carlin	Banker
Fred Yahn	Farmer
Blanda Hays	Banker
Troy Hinkhouse	Banker
Anna Hoshie	Farmer
Tyron Beerts	Land Broker
BRIAN ROSOUS	FARMER
Dennis Coryell	RRUCB/Plains Guild

Republican River Compact Administration – Annual Meeting Attendance Sheet
 August 24, 2016

Location _____ Burlington CO

Name – Please print legibly	Affiliation/Group
SAM PERKINS	KANSAS DEPT AGRICULTURE – DWR

FINAL AGENDA FOR
**2016 ANNUAL MEETING OF THE
REPUBLICAN RIVER COMPACT ADMINISTRATION**

August 24, 2016, 1:30 p.m. Mountain Time

Burlington Community Center

Conference Hall

340 S 14th St.

Burlington, CO 80807

1. Introductions
2. Adoption of the Agenda
3. Status of Report and Transcripts for 2015 Annual Meeting and prior Special Meetings
4. Report of Chairman and Commissioners' Reports
 - a. Kansas
 - b. Colorado
 - c. Nebraska
5. Federal Reports
 - a. Bureau of Reclamation
 - b. U.S. Army Corps of Engineers
 - c. U.S. Geological Survey
6. Committee Reports
 - a. Engineering Committee
 - i. Assignments from 2015 Annual Meeting
 - ii. Committee recommendations to RRCA
 - iii. Recommended assignments for Engineering Committee
7. Old Business
 - a. Status of unapproved previous accounting
 - b. Status of Report and Transcripts for 2014 Annual Meeting and prior Special Meetings
8. New Business and Assignments to Compact Committees
 - a. Three State Discussions
 - i. Kansas
 - ii. Colorado
 - iii. Nebraska
 - b. Action on Engineering Committee Report and assignments
 - c. Resolution Approving Change to Accounting Procedures for Non-Irrigation Season Canal Diversions for Groundwater Recharge Purposes & Associated Update to Rules & Regulations
 - d. Resolution Approving Colorado's Resolution Dated August 24, 2016
 - e. Resolution Approving Long-Term Agreements Related to Operation of Harlan County Lake During Compact Call Years
9. Remarks from the Public
10. Future Meeting Arrangements
11. Adjournment

RECLAMATION

Managing Water in the West

Nebraska-Kansas Area Office

Report

To The

Republican River

Compact Administration

Burlington, CO



**U.S. Department of the Interior
Bureau of Reclamation
Great Plains Region
Nebraska-Kansas Area Office**

August 24, 2016

Bureau of Reclamation
Nebraska-Kansas Area Office

Republican River Compact Administration
August 24, 2016

REPUBLICAN RIVER COMPACT MEETING

August 24, 2016
Burlington, Colorado

2015 Operations

As shown on the attached Table 1, precipitation in the Republican River Basin varied from 101 percent of normal at Trenton Dam to 127 percent of normal at Harlan County and Lovewell Dams. Total precipitation at Reclamation project dams ranged from 20.21 inches at Trenton Dam to 34.91 inches at Lovewell Dam.

Inflows varied from 56 percent of the most probable forecast at Keith Sebelius Lake to 154 percent of the most probable forecast at Swanson Lake. Inflows into Keith Sebelius Lake totaled 4,252 AF while inflows at Harlan County Lake totaled 106,728 AF.

Average farm delivery values for total irrigable acres were as follows:

<u>District</u>	<u>Farm Delivery</u>
Frenchman Valley	0.6 inches
H&RW	0.0 inches
Frenchman-Cambridge	3.8 inches
Almena	0.0 inches
Bostwick in NE	4.8 inches
Kansas-Bostwick	7.2 inches

2015 Operation Notes

Bonny Reservoir – Remained empty at elevation 3638.00 feet, 34.0 feet below the top of conservation. The annual computed inflow totaled 5,571 AF. Reservoir inflows were bypassed the entire year as ordered by the State of Colorado. A total of 1,028 AF was bypassed into Hale Ditch from April 1st through October 20th.

Enders Reservoir – Started the year at elevation 3082.72 feet, 29.6 feet below the top of conservation. This was the lowest level ever recorded on the first of January since initial filling. The reservoir level increased gradually during the spring to a peak elevation of 3085.50 feet on June 7, 2015. Evaporation decreased the reservoir level from June through mid-October reaching elevation 3083.67 feet on October 22nd. The 2015 computed inflow totaled 5,554 AF. No water was released from Enders Reservoir for irrigation. This was the fourteenth consecutive year that H&RW Irrigation District did not divert water. It was also the twelfth consecutive year that storage releases were not made for Frenchman Valley Irrigation District. The end of the year reservoir level was 28.0 feet (3084.28 feet) below the top of conservation.

Bureau of Reclamation
Nebraska-Kansas Area Office

Republican River Compact Administration
August 24, 2016

Swanson Lake – Started the year at elevation 2728.96 feet, 23.0 feet below the top of conservation. The annual computed inflow totaled 42,316 AF (includes water pumped from the Rock Creek Augmentation Project and Colorado's Compact Compliance Pipeline). The lake gradually increased throughout the winter and spring. The peak elevation on June 24th was 2739.74 feet (12.3 feet below the top of conservation). The reservoir level decreased throughout the irrigation season and reached an elevation of 2733.77 feet on November 10th. The district diverted 15,350 AF into Meeker-Driftwood Canal from June 24th through September 3rd. At the end of the year, the reservoir level was 17.2 feet below the top of conservation at 2734.84 feet.

Hugh Butler Lake – Started the year at elevation 2556.88 feet, 24.9 feet below the top of conservation. The 2015 computed inflow was 9,064 AF. Late winter and spring inflows gradually increased the lake level to elevation 2562.60 feet by the end of June. Summer evaporation slowed reservoir gains and the lake level peaked at 2562.74 feet on August 10th. No irrigation releases were made from Hugh Butler Lake in 2015. The reservoir elevation at the end of year was 2562.97 feet, 18.8 feet below the top of conservation.

Harry Strunk Lake – Started the year at elevation 2367.85 feet, 1.8 feet above the top of conservation. The annual computed inflow totaled 58,086 AF (includes water pumped from the Nebraska Cooperative Republican Platte Enhancement Project). The reservoir level was maintained near this level through the end of June as all inflows were passed through the uncontrolled spillway notch. Additional releases were started from the river outlet works on June 29th to meet increasing irrigation demands. Irrigation releases continued through September 8th reducing the reservoir level to 2361.76 feet. The district diverted 29,156 AF into Cambridge Canal. Late fall and early winter inflows increased the level of Harry Strunk Lake to elevation 2365.60 feet on November 16th (0.5 foot below the top of conservation). Releases were started at this time to maintain this reservoir level.

Keith Sebelius Lake – Started the year at elevation 2288.02 feet, 16.3 feet below the top of conservation. The total 2015 computed inflow was 4,252 AF. The reservoir level slowly increased to elevation 2288.81 feet on June 19th. No irrigation releases were made from Keith Sebelius Lake in 2015. The reservoir level gradually decreased during the summer and fall reaching elevation 2287.24 feet on November 10th. Keith Sebelius Lake ended the year at elevation 2287.74 feet (16.6 feet below the top of conservation).

Harlan County Lake – Started the year at elevation 1930.81 feet, 14.9 feet below the top of conservation. The 2015 computed inflow totaled 106,728 AF (includes augmentation water that passed through Harry Strunk Lake). The lake level peaked at elevation 1936.45 feet on June 22nd. Irrigation releases began on June 21st and continued through September 11th decreasing the pool level to elevation 1931.56 feet. Bostwick in Nebraska Irrigation District diverted 24,133 AF in 2015. Kansas Bostwick Irrigation District entered into an Excess Capacity Contract (Warren Act Authority) with Reclamation for the use of compact compliance water stored in Harlan County Lake in 2014. An amendment to this contract in December 2014 provided for 14,100 AF of water to be carried over into 2015. No water was released under this contract during the 2015 irrigation season. Irrigation releases from Harlan County Lake totaled 70,554 AF in 2015. The reservoir elevation was 1932.86 feet (12.9 feet below the top of conservation) on December 31st. A ten year summary of Harlan County

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Lake operations is shown on Table 3.

Lovewell Reservoir – Started the year at elevation 1580.46 feet, 2.1 feet below the top of conservation. The annual computed inflow total for 2015 was 71,888 AF. Republican River diversions were made via the Courtland Canal into Lovewell Reservoir from early January through late April. The pool level gradually increased to elevation 1583.88 feet on May 6th.

Lovewell Dam recorded 7.78 inches of rainfall overnight on May 6th. Runoff from the storm event increased the level of Lovewell Reservoir to 7.2 feet into the flood pool with 50 percent of the flood pool storage occupied. Flood releases were staged up to 1,250 cfs by May 9th and maintained through May 18th when Lovewell Reservoir reached the desired target level. Approximately 23,000 AF was released from the reservoir. Lovewell Dam recorded 11.41 inches of precipitation during May.

Releases to the canal began on May 19th and continued through September 12th. The reservoir elevation at the end of the irrigation season was 1578.80 feet. Republican River diversions continued through mid-December. The Kansas Bostwick Irrigation District diverted a total of 51,980 AF in 2015, including 31,544 AF from Lovewell Reservoir. The reservoir level at the end of the year was 1582.13 feet (0.5 feet below top of conservation).

Current Operations (As of 7/31/16)

Bonny Reservoir – The reservoir is currently empty. Inflows continue to be bypassed through the reservoir as ordered by the State of Colorado. Approximately 673 AF has been released into Hale Ditch in 2016. Bonny Dam has recorded 14.58 inches of precipitation during the first seven months of the year (125% of average).

Enders Reservoir - The reservoir level is currently 27.0 feet below full and 0.6 feet above last year at this time. Enders Dam recorded 17.00 inches of precipitation during the first seven months of the year (132% of normal). Due to the water supply shortage, H&RW Irrigation District is not irrigating for the fifteenth year in a row. This is also the thirteenth consecutive year that Frenchman Valley Irrigation District has not received storage water for irrigation.

Swanson Lake – The lake level is currently 13.7 feet from full and is 1.3 feet above last year at this time. Precipitation for the year is at 116% of normal (15.72 inches). Irrigation releases began on June 20th.

Hugh Butler Lake – The lake level is currently 16.1 feet below full and is 3.2 feet above last year at this time. The precipitation total so far this year is 13.19 inches (103% of normal). Irrigation releases are not being made from Hugh Butler Lake this season.

Harry Strunk Lake – The lake level is currently 3.6 feet below the top of conservation. Precipitation at the dam during the first seven months of the year was 18.19 inches (132% of normal). Irrigation releases began on June 17th. The lake level is currently 2.1 feet below last

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year at this time.

Keith Sebelius Lake – Currently 15.9 feet below full. Lake level is .2 foot above last year at this time. Due to a short water supply, irrigation releases are not being made in 2016. Precipitation at the dam during the first seven months of the year was 14.42 inches (89% of normal).

Harlan County Lake – The current water surface level is approximately 8.3 feet below full. The lake level is 3.7 feet above last year at this time. Harlan County Dam has recorded 19.06 inches of precipitation so far this year (128% of normal). Irrigation releases began on June 10th. The available irrigation supply from Harlan County Lake on June 30, 2016 was 103,500 AF, indicating that “Water-Short Year Administration” would be in effect.

Lovewell Reservoir – The reservoir level is currently 1.2 foot below the top of conservation and approximately 0.6 feet below last year’s elevation at this time. Lovewell Dam recorded 21.94 inches of precipitation during the first seven months of the year (128% of average). Irrigation releases began on May 2nd.

A summary of data for the first seven months of 2016 is shown on Table 2.

Other Items

Excess Capacity Contract – Harlan County Lake – An Excess Capacity Contract (Contract) was executed with Kansas Bostwick Irrigation District (KBID) to temporarily store inflows into Harlan County Lake under the State of Nebraska’s Compact Call water right administration. This Contract allowed water to be temporarily stored for KBID’s use during the 2014 irrigation season. The contract was extended and amended into 2015 and 2016 to allow for carryover of the temporary storage.

WaterSMART Basin Study Program - The States of Colorado, Nebraska, and Kansas and the U.S. Department of the Interior, Bureau of Reclamation completed the Republican River Basin Study in early 2016. The Republican River Basin Study area covers the entire Republican River Basin in eastern Colorado, southern Nebraska, and northern Kansas down to the Clay Center gauging station in Kansas. The Basin Study represented an extensive collaborative effort among the states of Colorado, Kansas, and Nebraska to identify adaptation strategies that address current and future water management challenges in the basin.

The Basin Study found that climate change may have a pronounced impact on future supplies and demands across the basin. The modeling tools developed under the study were used to evaluate alternatives to improve the supply reliability at the Frenchman-Cambridge Irrigation District in Nebraska, as well as the Bostwick Irrigation Districts in Nebraska and Kansas.

Nebraska focused on augmenting the supply of Swanson Lake and creating new surface water storage on Thompson Creek, a tributary of the Republican River. Kansas evaluated alternatives that increase the storage volume at Lovewell Reservoir.

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The newly developed ground and surface water modeling tools will help inform future water management decisions that help build resiliency against future climate change, while also maintaining compliance with the Republican River Compact.

The Republican River Basin Study is a part of Reclamation's WaterSMART Program. The report is available online at www.usbr.gov/watersmart/bsp.

TABLE 1
NEBRASKA-KANSAS PROJECTS
Summary of Precipitation, Reservoir Storage and Inflows
CALENDAR YEAR 2015

Reservoir	Total Precip. Inches	Percent Of Average %	Storage 12-31-14		Storage 12-31-15	Gain or Loss		Maximum Storage		Minimum Storage		Total Inflow AF	Percent Of Most Probable %
			AF	AF		AF	AF	Content	Date	Content	Date		
Box Butte	25.10	148	10,846	17,339	6,493	23,473	JUL 10	10,883	JAN 1	20,980	136		
Merritt	28.99	142	61,100	61,100	0	68,191	MAY 16	39,120	SEP 16	202,465	109		
Calamus	22.61	94	97,906	102,456	4,550	121,355	APR 13	65,268	SEP 13	250,588	91		
Davis Creek	26.48	107	9,751	9,849	98	31,340	JUL 1	8,955	APR 16	52,348	116		
Bonny	20.78	121	0	0	0	0	N/A	0	N/A	5,571	61		
Enders	20.23	106	9,150	10,178	1,028	11,024	JUN 7	9,150	JAN 1	5,554	68		
Swanson	20.21	101	27,688	43,591	15,903	59,359	JUN 26	27,736	JAN 1	42,316	154		
Hugh Butler	21.80	111	8,141	12,879	4,738	12,879	DEC 31	8,155	JAN 1	9,064	69		
Harry Strunk	23.74	115	37,984	33,773	-4,211	38,860	FEB 11	27,545	SEP 8	58,086	105		
Keith Sebelius	27.25	111	9,676	9,422	-254	10,425	JUN 19	8,979	NOV 10	4,252	56		
Harlan County	28.85	127	148,842	167,416	18,574	203,282	JUN 22	148,842	JAN 1	106,728	91		
Lovewell	34.91	127	29,620	34,279	4,659	61,018	MAY 8	25,397	SEP 10	71,888	123		
Kirwin	23.36	99	41,266	35,389	-5,877	44,752	JUN 15	34,199	OCT 30	17,802	65		
Webster	21.84	92	18,680	17,305	-1,375	19,697	JUL 28	17,042	NOV 15	5,057	26		
Waconda	25.66	101	191,097	213,417	22,320	241,452	AUG 10	190,868	APR 23	103,844	76		
Cedar Bluff	25.47	121	61,117	55,681	-5,436	61,494	JUN 6	55,184	NOV 15	7,763	46		

TABLE 2
NEBRASKA-KANSAS AREA OFFICE
Summary of Precipitation, Reservoir Storage and Inflows

JANUARY - JULY 2016

Reservoir	Precip.	Percent Of Average %	Storage	Storage	Gain or Loss AF	Inflow	Percent Of Most Probable %
	Inches		7/31/2015 AF	7/31/2016 AF		AF	
Bonny	14.58	125	0	0	0	3,781	61
Enders	17.00	132	10,435	10,861	426	3,406	76
Swanson	15.72	116	50,540	54,645	4,105	27,887	128
Hugh Butler	13.19	103	12,501	15,384	2,883	5,383	65
Harry Strunk	18.19	132	32,025	28,661	(3,364)	45,697	176
Keith Sebelius	14.42	89	9,797	10,040	243	3,470	67
Harlan County	19.06	128	176,493	214,164	37,671	106,636	132
Lovewell	21.94	128	34,075	32,246	(1,829)	30,678	122

Inflow at Swanson Lake and Harry Strunk Lake includes water from augmentation (pumping) projects.

**TABLE 3
HARLAN COUNTY LAKE**

Year	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches) (% of Average)	Precipitation		Rep. Basin Dams	End of Year Content (AF)	Projected Irrig. Water Supply On June 30th (AF)
					Harlan County Dam*	(% of Average)			
2006	30,077	12,280	29,609	20.62	91%	101%	116,299	14,400	
2007	198,528	21,237	38,197	26.92	118%	114%	255,393	111,700	
2008	224,841	114,938	45,985	30.31	133%	131%	319,311	175,900	
2009	136,747	94,079	41,721	24.50	108%	128%	320,258	156,000	
2010	239,054	194,055	46,893	31.66	139%	119%	318,364	147,800	
2011	174,830	120,989	49,241	30.69	135%	115%	322,964	157,700	
2012	78,581	160,221	50,199	18.14	80%	64%	191,125	132,900	
2013	48,794	75,355	40,042	17.46	77%	83%	124,522	81,400	
2014	92,209	35,502	32,387	18.53	81%	105%	148,842	59,000	
2015	106,728	54,502	33,652	28.85	127%	115%	167,416	79,600	

NOTE: On June 30, 2016 Projected Irrig. Water Supply was 103,500 AF.
* Average Annual Precipitation at Harlan County Dam is 22.76 inches

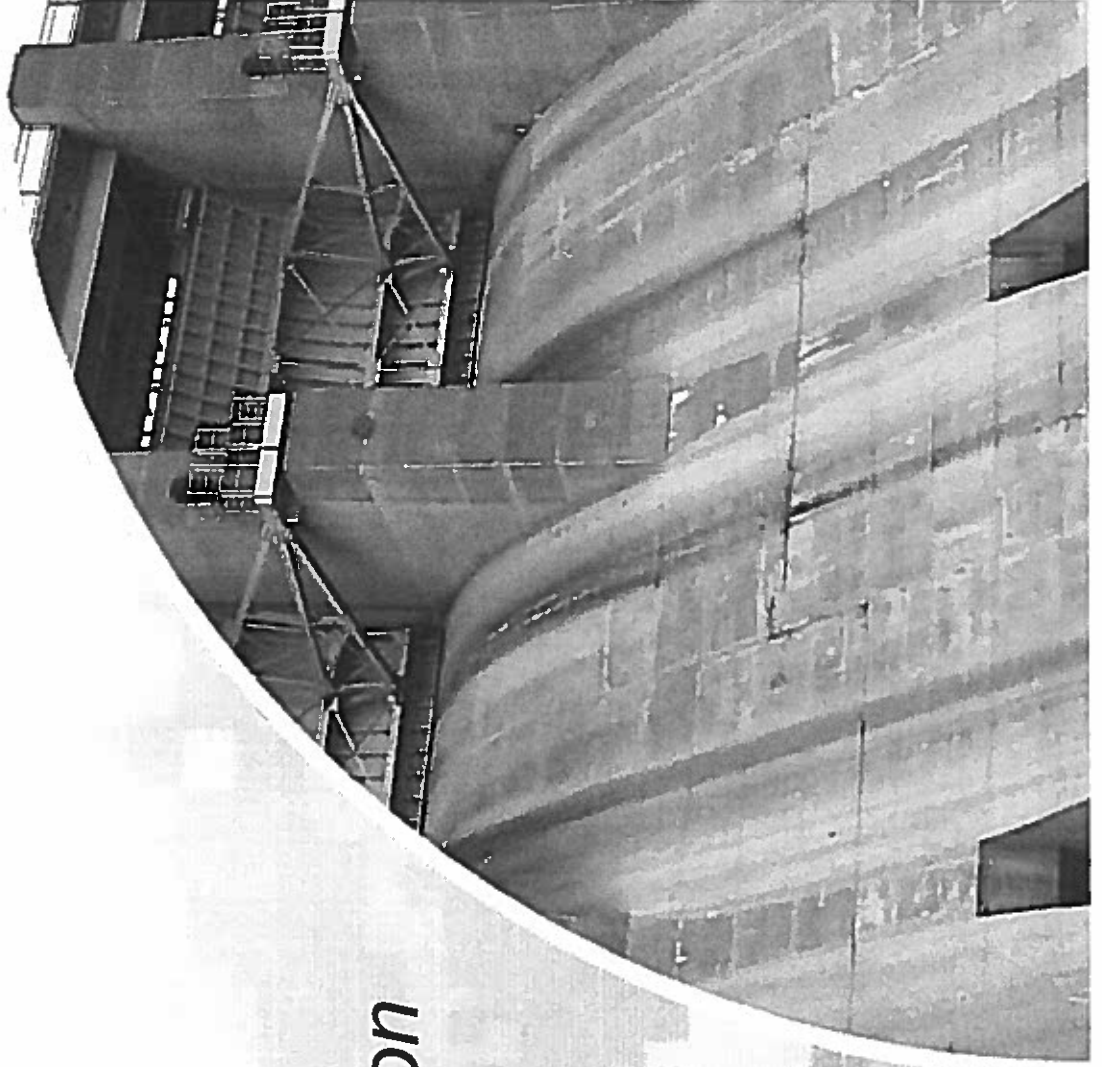
Harlan County Dam Tainter Gate & Irrigation Repairs

*John Grothaus,
Chief, Plan Formulation
Kansas City District*

August 24, 2016

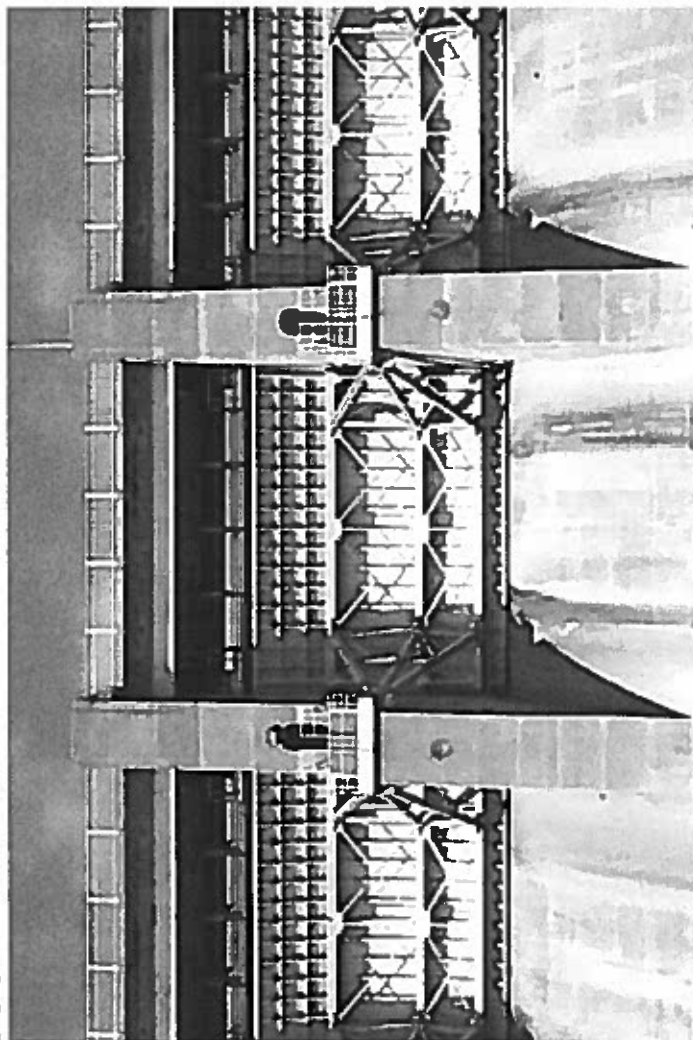


US Army Corps of Engineers
BUILDING STRONG®

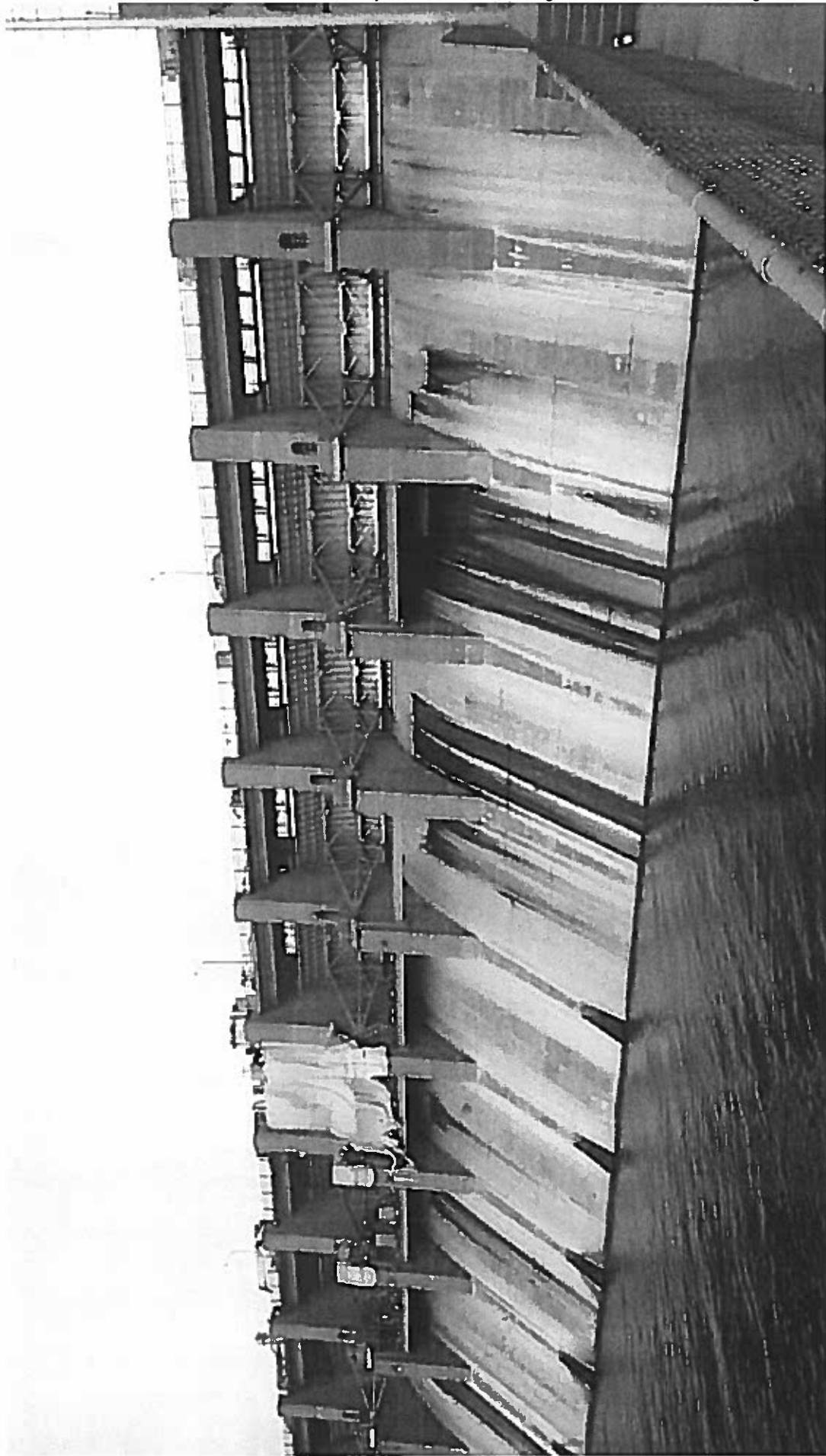


Presentation Outline

- Overview of Dam
- Dam Repairs
- Construction Status



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August 2016 – Structural Repairs Complete Gates 1-8. Painting Complete Gates 1-7



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Upcoming Work

Irrigation Conduit Repairs/Replacement

Questions?



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Republican River Compact Nebraska Stream-Gaging Data Water Year 2015

Presented to
Republican River Compact Administration
By John Miller, Field Office Chief
Nebraska Water Science Center

August 24, 2016
Burlington, CO



Summary handout – stations published by U.S. Geological Survey (USGS)

Republican River Basin streamflow-gaging stations with records published by USGS for water year (WY) 2015

[DCP, data-collection platform; NDNR, Nebraska Department of Natural Resources; USACE, U.S. Army Corps of Engineers; USBR, U.S. Bureau of Reclamation; USGS, U.S. Geological Survey]

Station number	Station name	Mean discharge (ft ³ /s)		WY 2015 as		WY 2015 as		WYs used		Remarks
		WY 2015	Long-term	percentage of long-term mean	rank/years (1 highest)	for long-term mean	for long-term mean	for long-term mean		

USGS Compact stations supported by the National Streamflow Information Program (NSIP)

06821500	Arikaree River at Haigler, Nebr	0.2	16.1	1.2%	81/83	1933 - 2015				
06823000	North Fork Republican River at Colo-Nebr State Line	35.9	41.2	87.1%	57/80	1935 - 2015				
06823500	Buffalo Creek near Haigler, Nebr	2.0	5.9	34.4%	73/75	1941 - 2015				
06824000	Rock Creek at Parks, Nebr	13.9	12.3	113.0%	25/75	1941 - 2015				
06827500	South Fork Republican River near Benkelman, Nebr	6.7	34.3	19.4%	68/78	1938 - 2015				
06835500	Frenchman Creek at Culbertson, Nebr	27.6	65.1	42.4%	62/65	1951 - 2015				Since Enders Reservoir
06836500	Driftwood Creek near McCook, Nebr	3.4	8.1	42.0%	57/69	1947 - 2015				
06838000	Red Willow Creek near Red Willow, Nebr	4.8	13.4	36.0%	53/54	1962 - 2015				Since Hugh Butler Lake
06847500	Sappa Creek near Stamford, Nebr (USACE funds DCP)	4.6	37.4	12.3%	52/69	1947 - 2015				
06852500	Courtland Canal at Nebr-Kans State Line (USBR DCP)	63.0	75.6	83.3%	42/61	1955 - 2015				

USGS stations supported by USGS and/or other Federal or State agencies

06828500	Republican River at Stratton, Nebr	60.1	92.3	65.1%	48/65	1951 - 2015				Funded by USACE and NSIP
06837000	Republican River at McCook, Nebr	34.6	121.1	28.6%	56/61	1955 - 2015				Funded by USBR, NDNR, and NSIP
06844500	Republican River near Orleans, Nebr	109.0	225.0	48.4%	57/68	1948 - 2015				Funded by USACE and NSIP

NDNR stations with USGS/USACE support for DCP, Web display, review, and publishing

06834000	Frenchman Creek at Pallsade, Nebr	19.4	59.0	32.9%	May-65	1951 - 2015				
06843500	Republican River at Cambridge, Nebr	97.6	206.5	47.3%	60/66	1950 - 2015				Since Harry Strunk Lake

Online Annual Water Data Reports available at or through:

<http://wdr.water.usgs.gov>

<http://ne.water.usgs.gov>



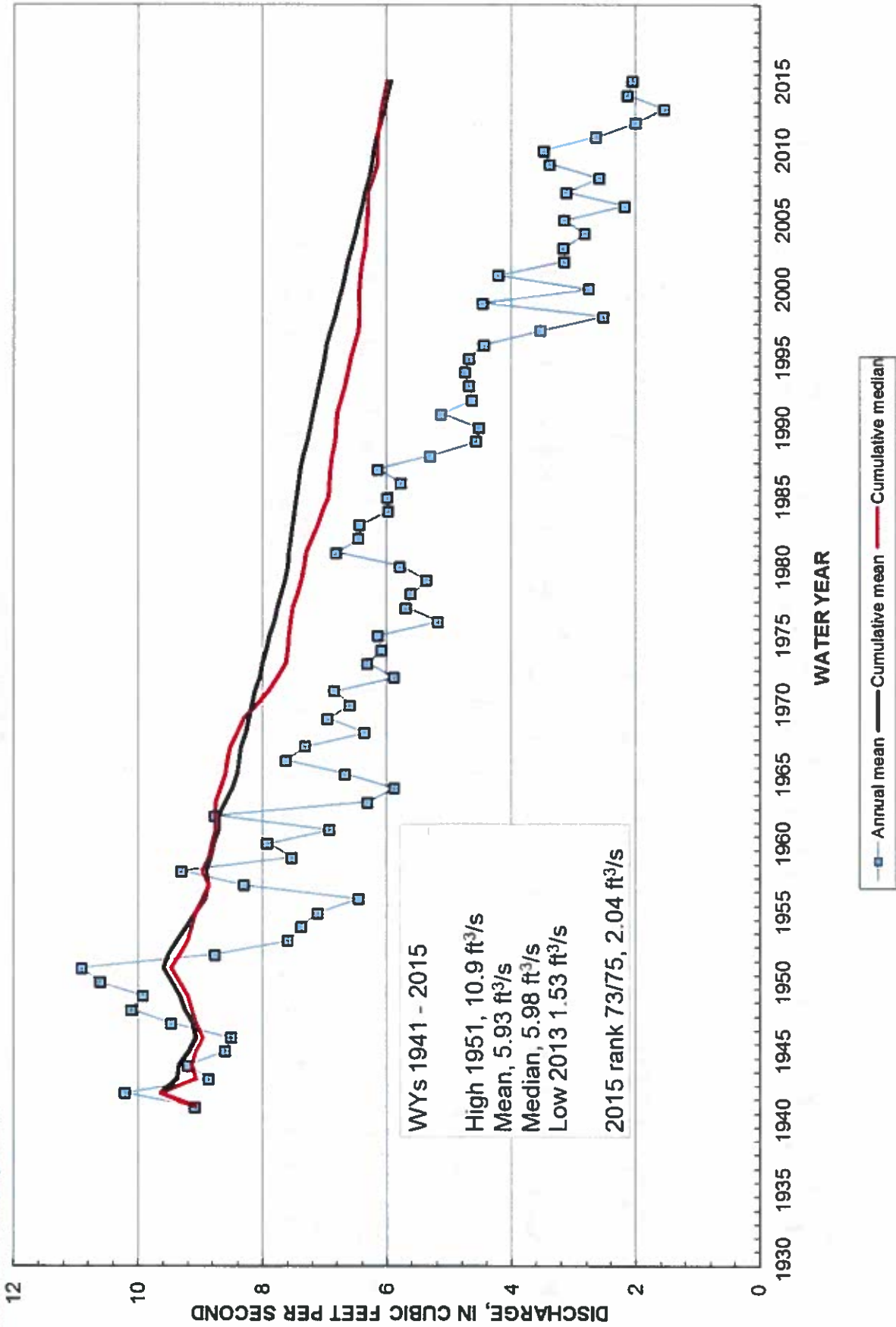
Summary Charts – Compact Stations

- Published data for Water Year (WY) 2015
- Operated by the USGS Nebraska Water Science Center (NE WSC)
- Stations funded by the USGS National Streamflow Information Program (NSIP)



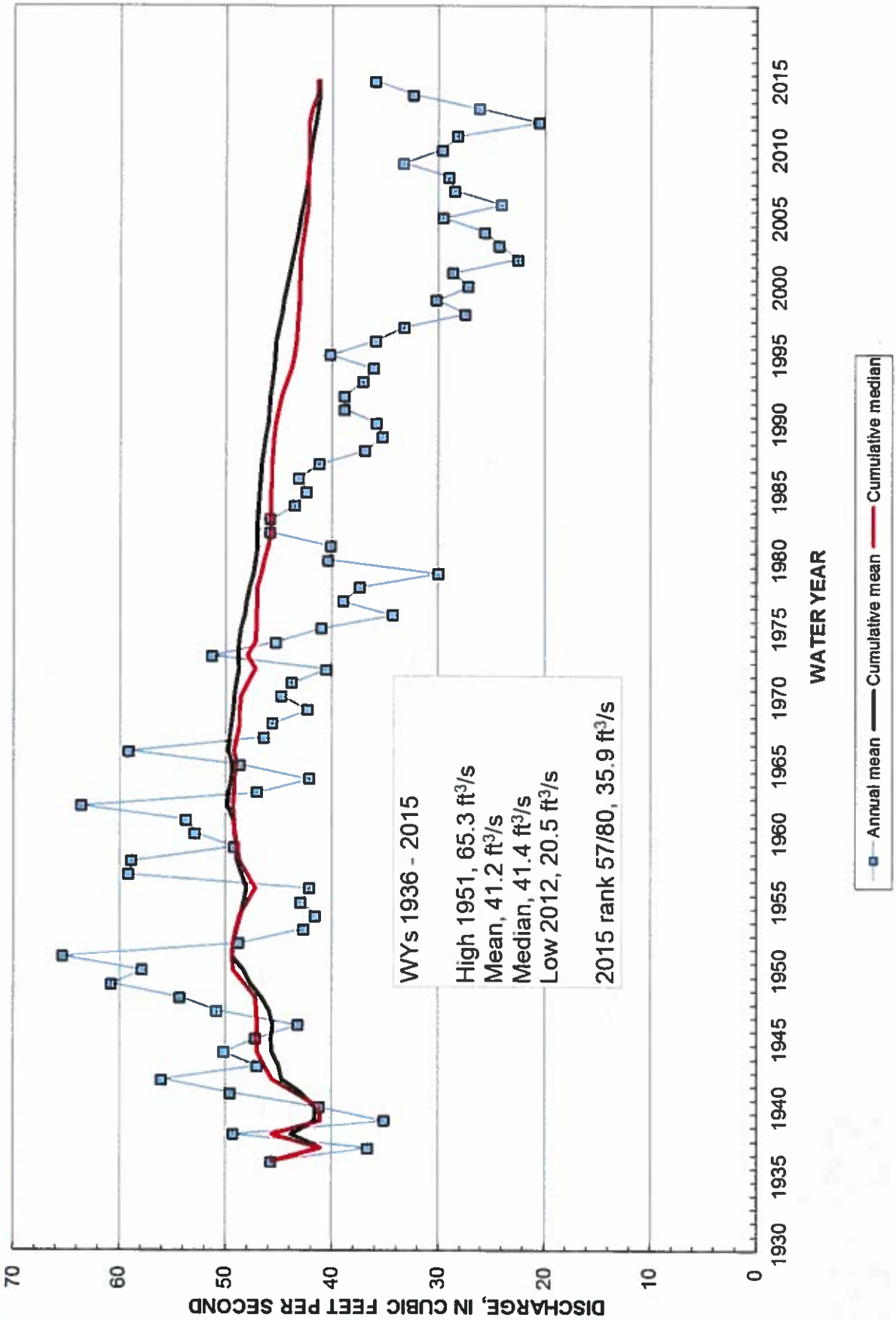


06823500 Buffalo Creek near Haigler, NE



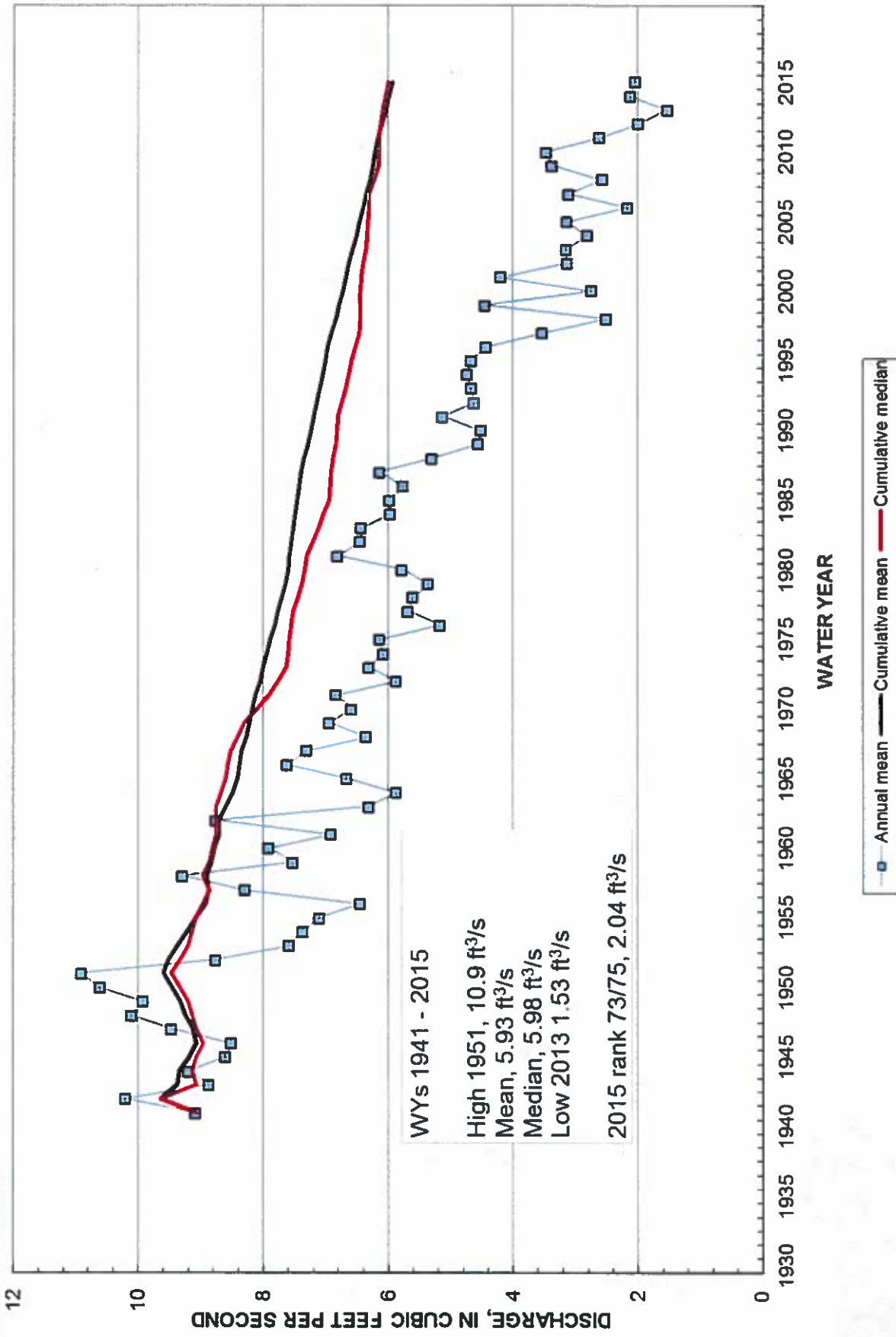


06823000 N Fk Republican River at CO-NE State Line





06823500 Buffalo Creek near Haigler, NE



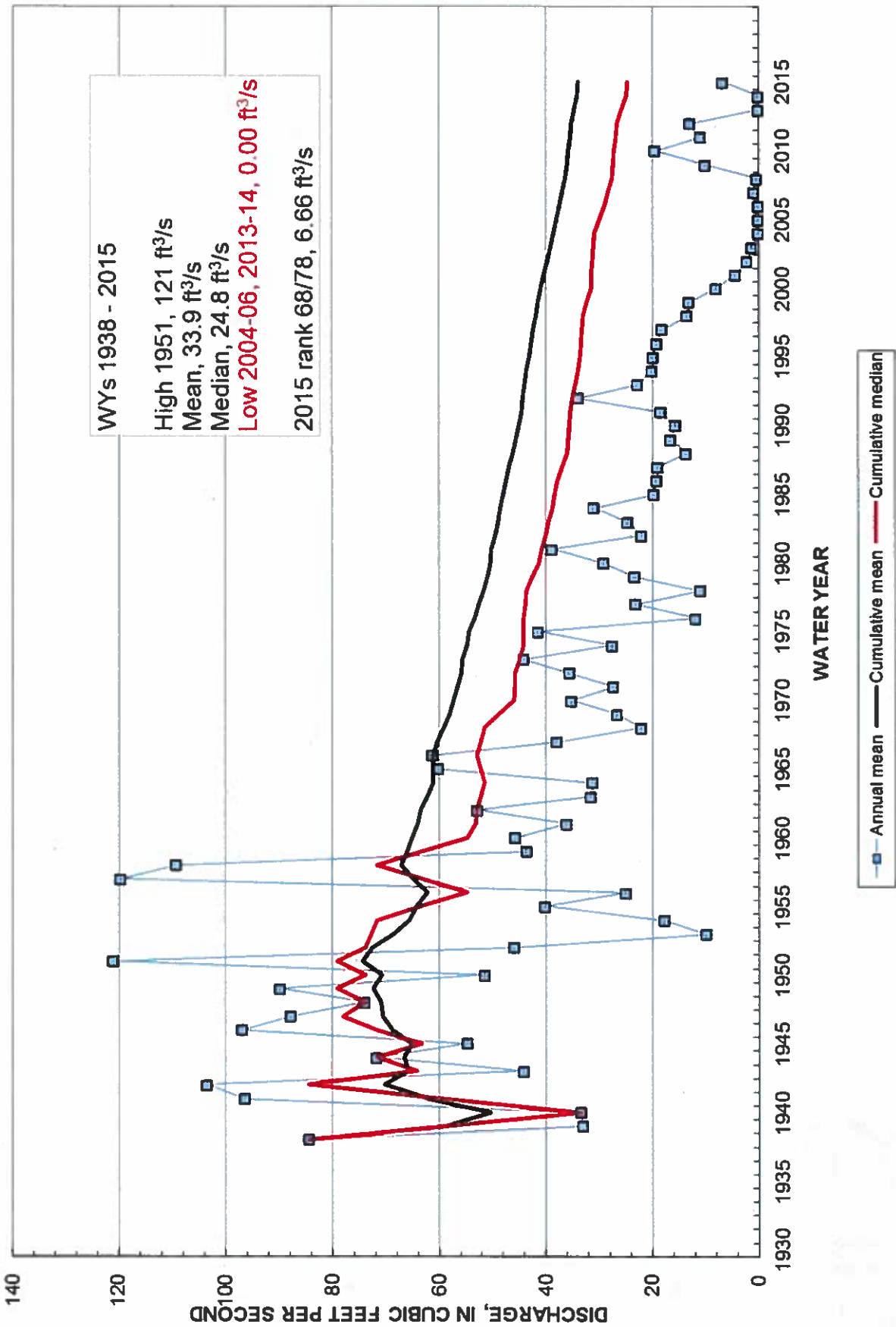


06824000 Rock Creek at Parks, NE



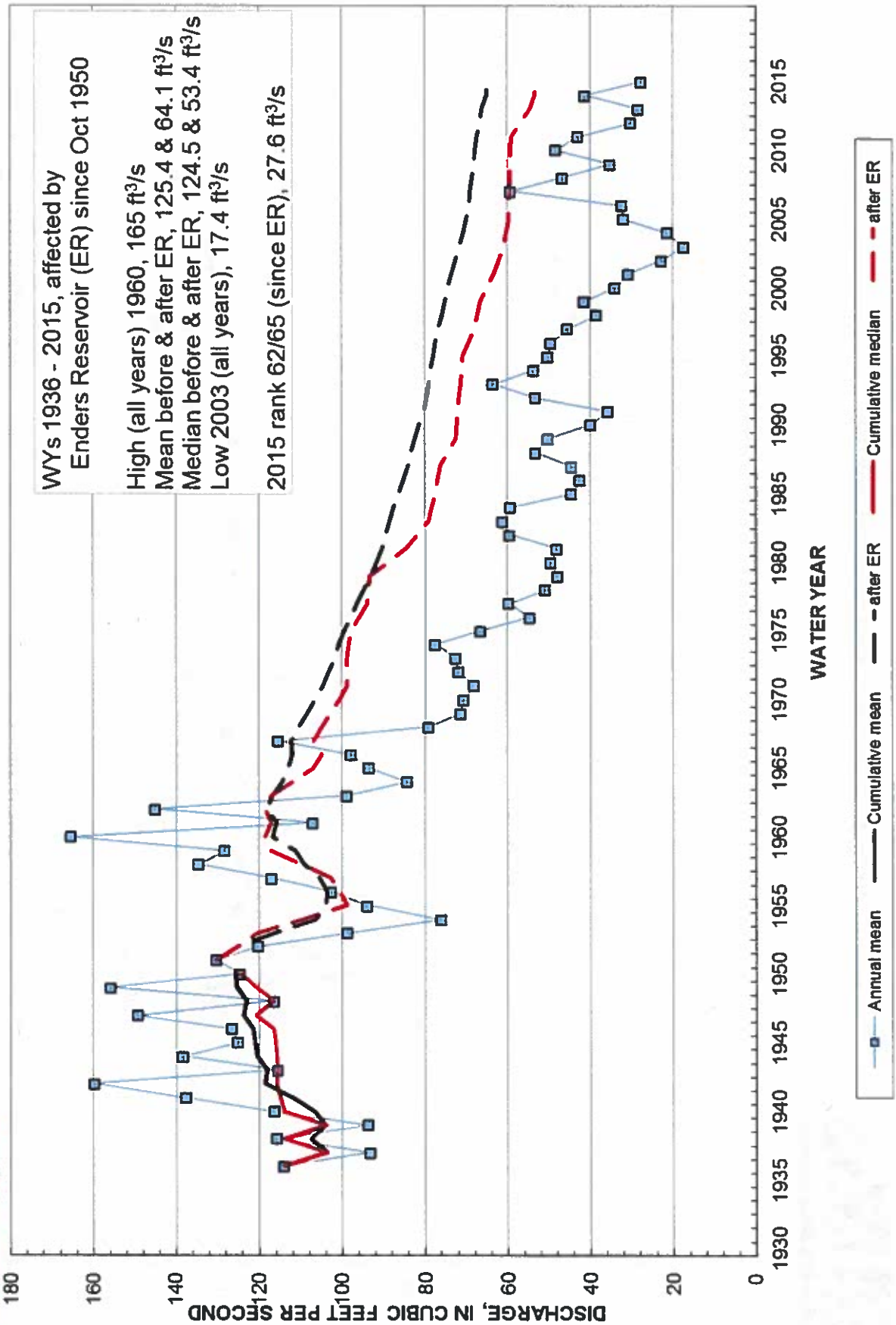


06827500 S Fk Republican River near Benkelman, NE



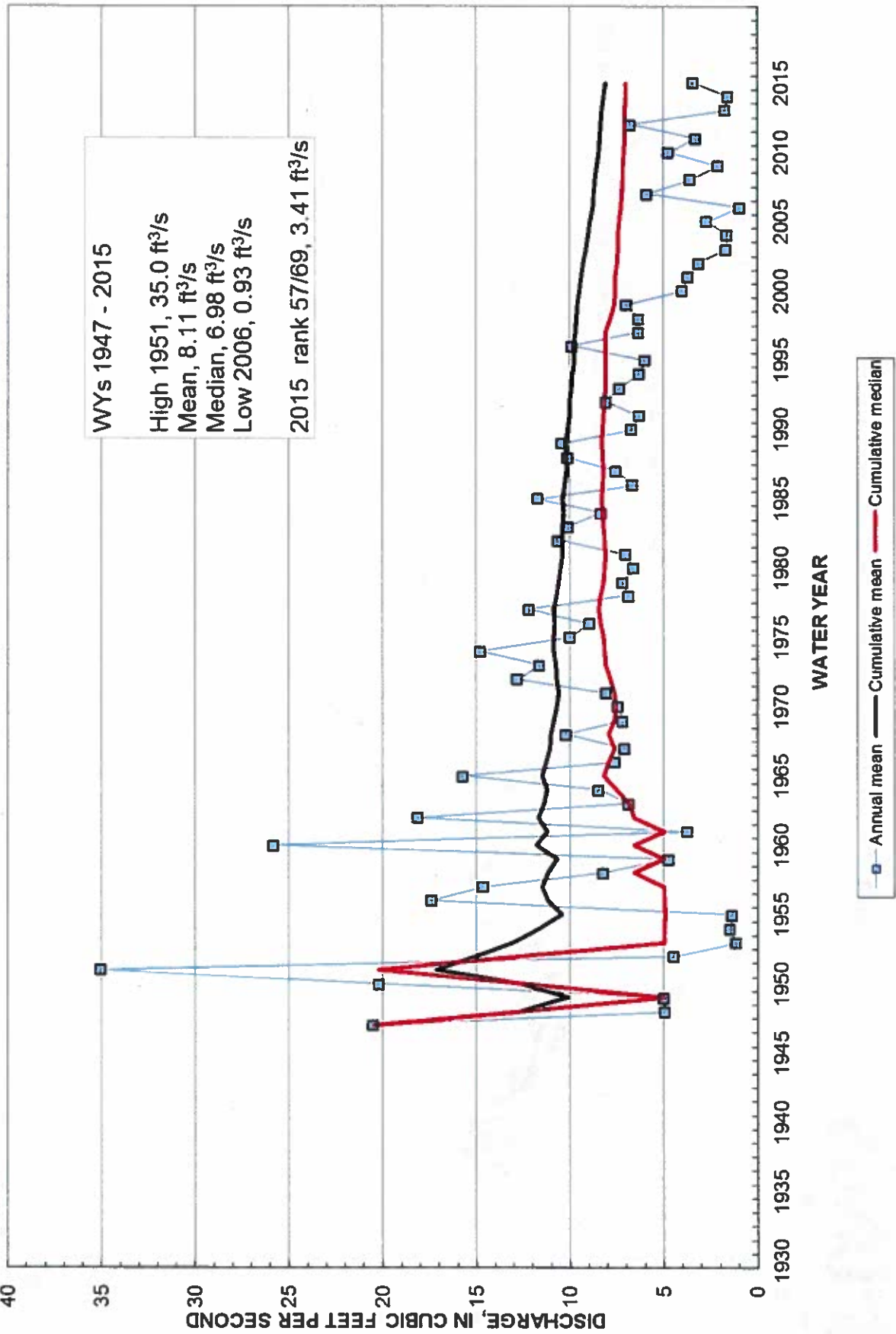


06835500 Frenchman Creek at Culbertson, NE



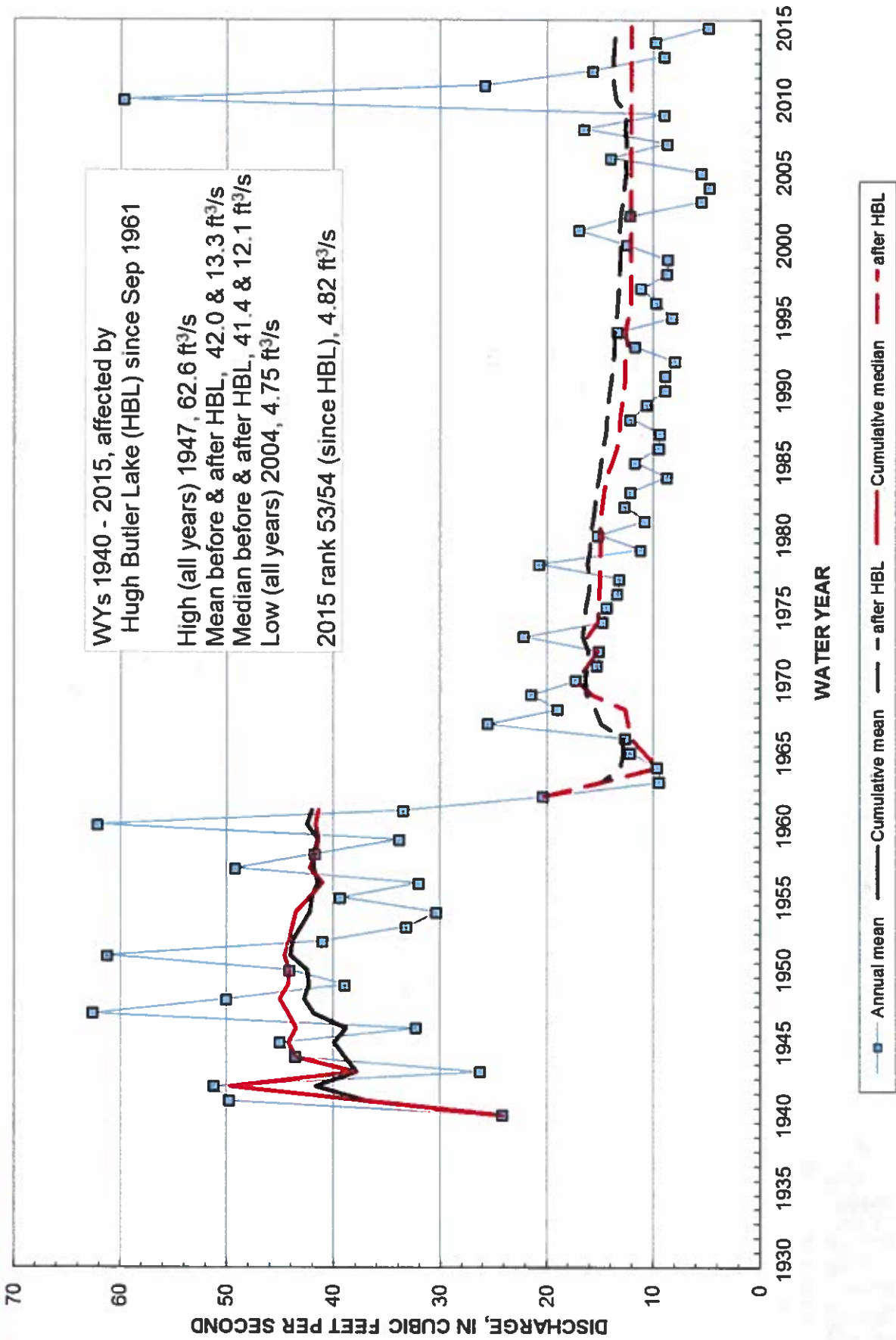


06836500 Driftwood Creek near McCook, NE



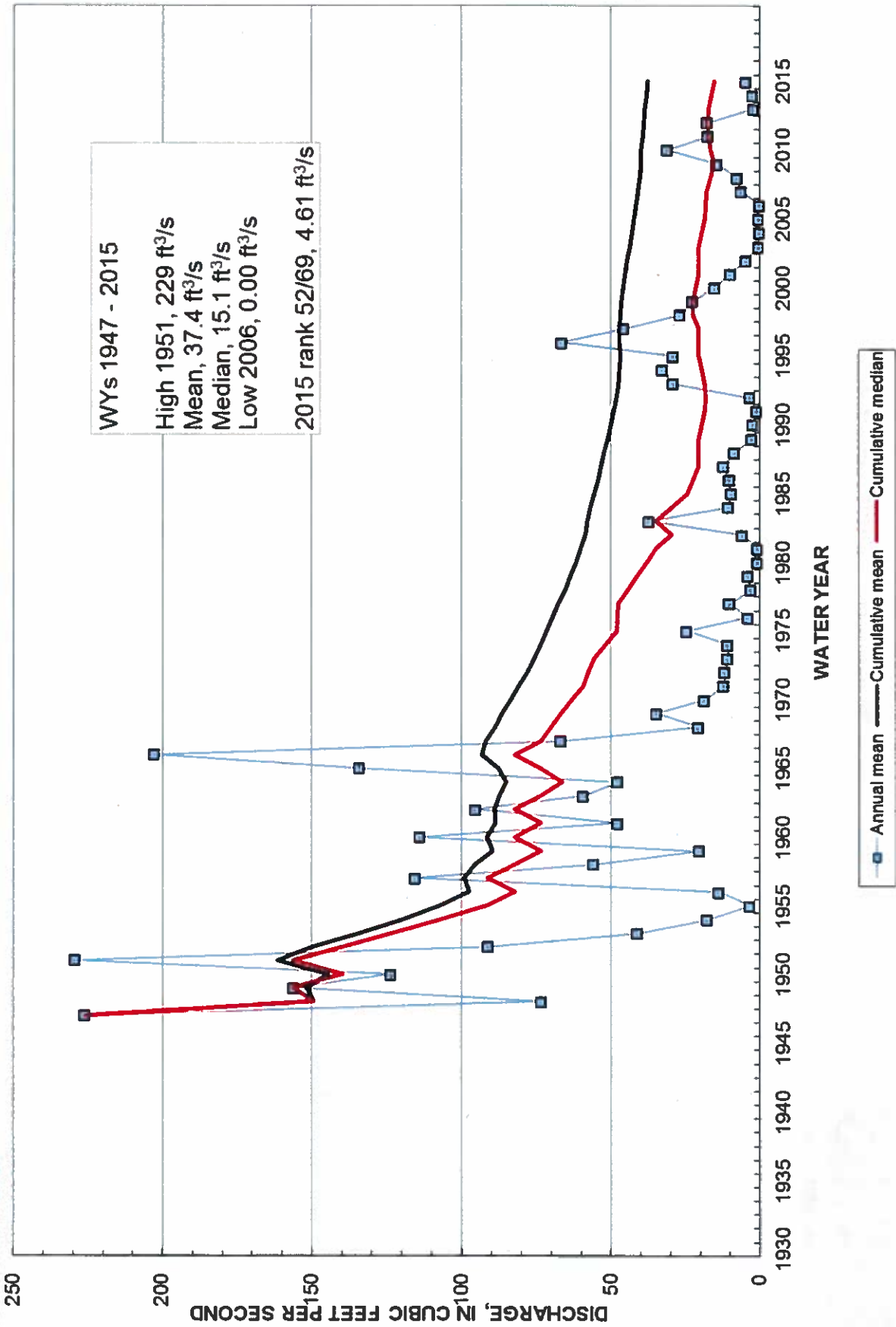


06838000 Red Willow Creek near Red Willow, NE



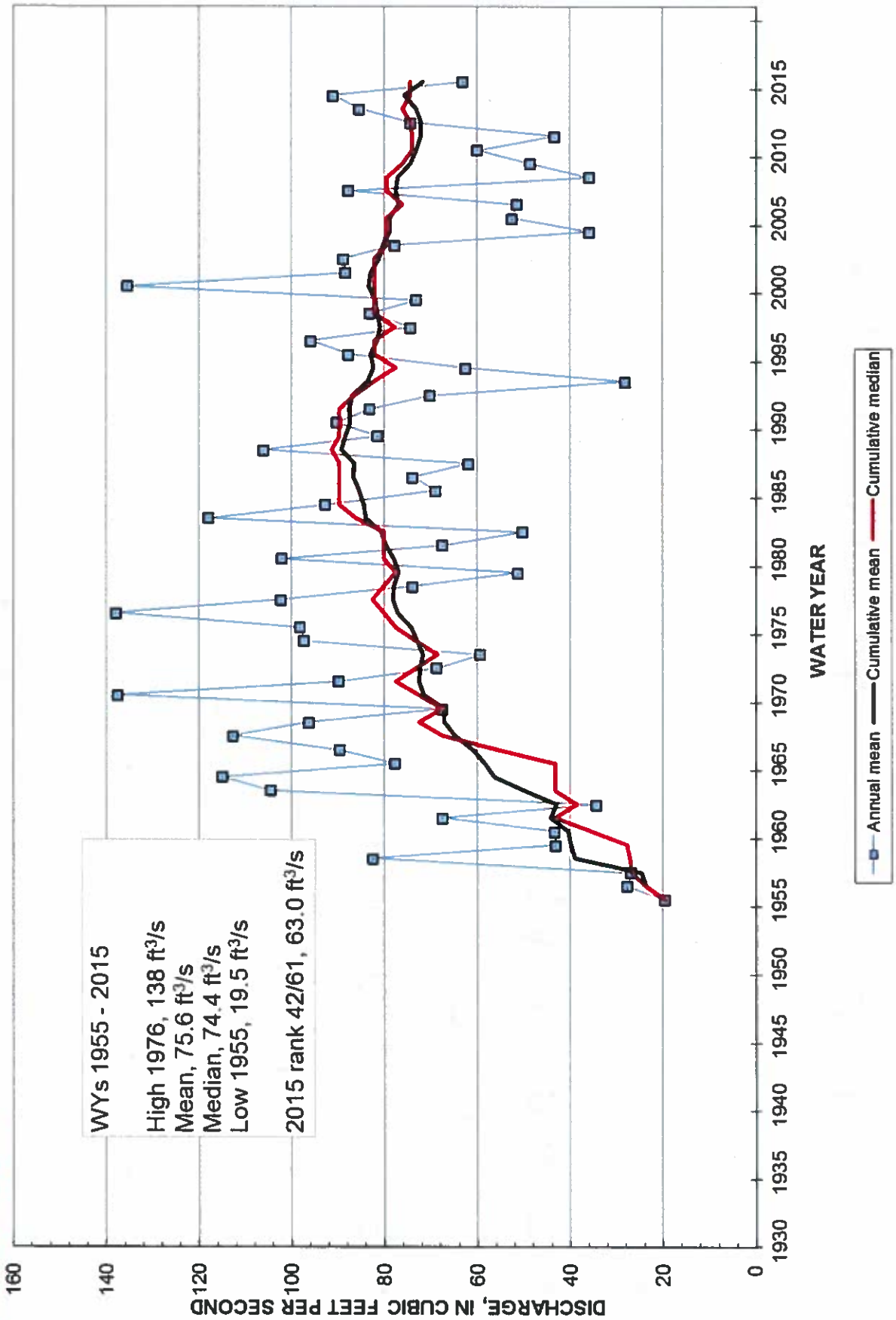


06847500 Sappa Creek near Stamford, NE





06852500 Courtland Canal at NE-KS State Line



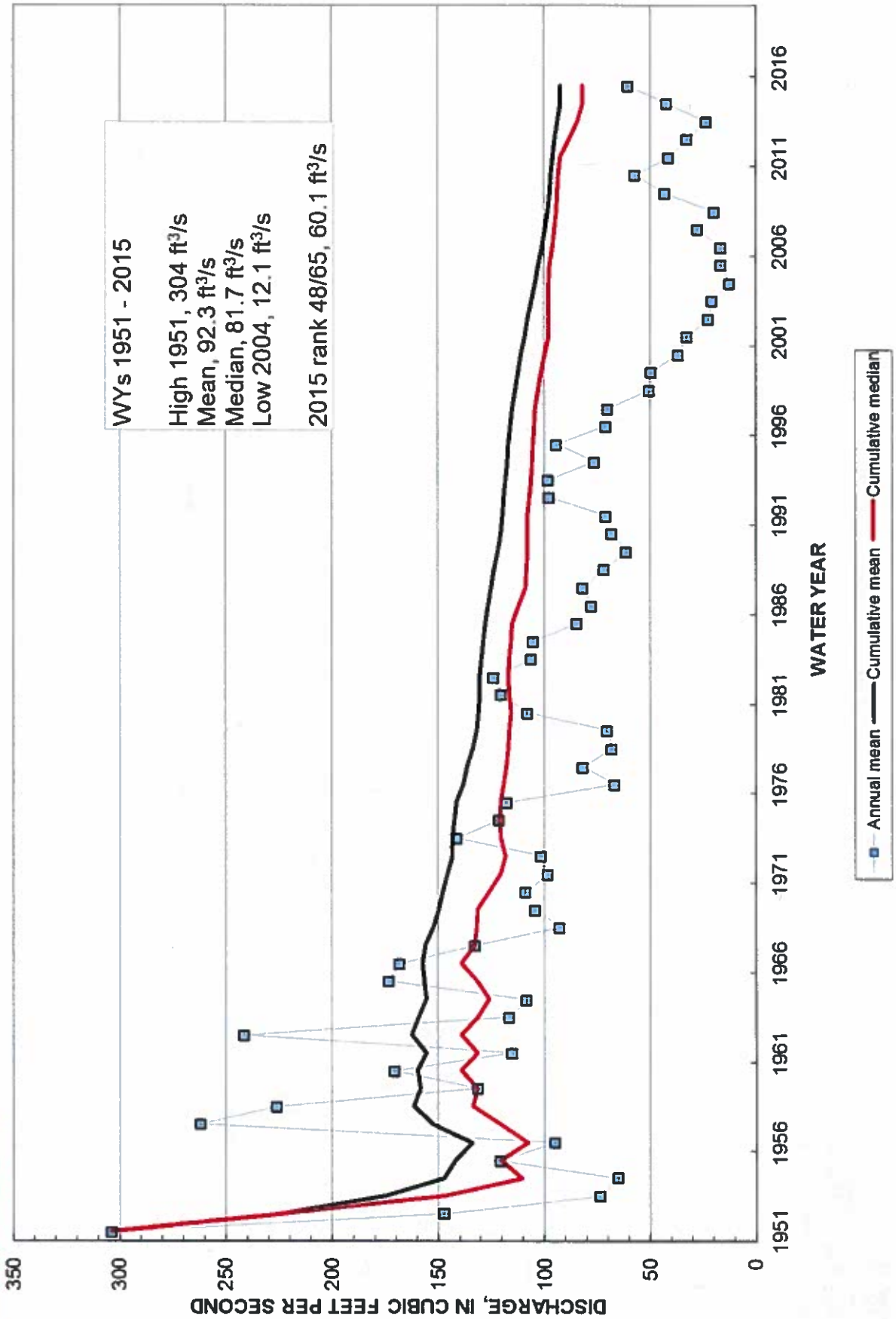
Summary Charts – Other USGS Stations

- Published data for Water Year 2015
- Operated by the USGS Nebraska Water Science Center
- Stations funded by:
 - other Federal agencies
 - State and local agencies with USGS match from the Cooperative Water Program



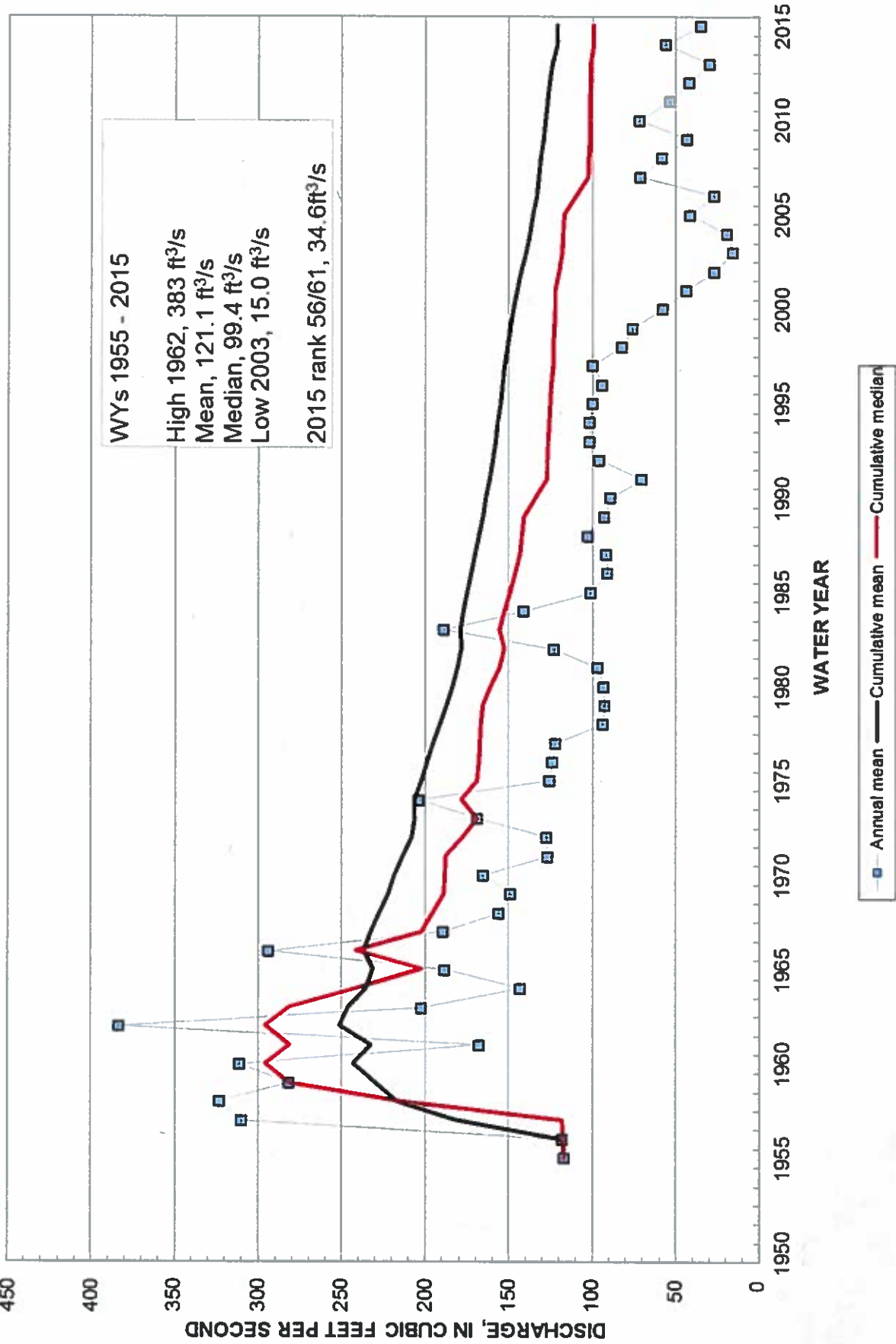


06828500 Republican River at Stratton, NE



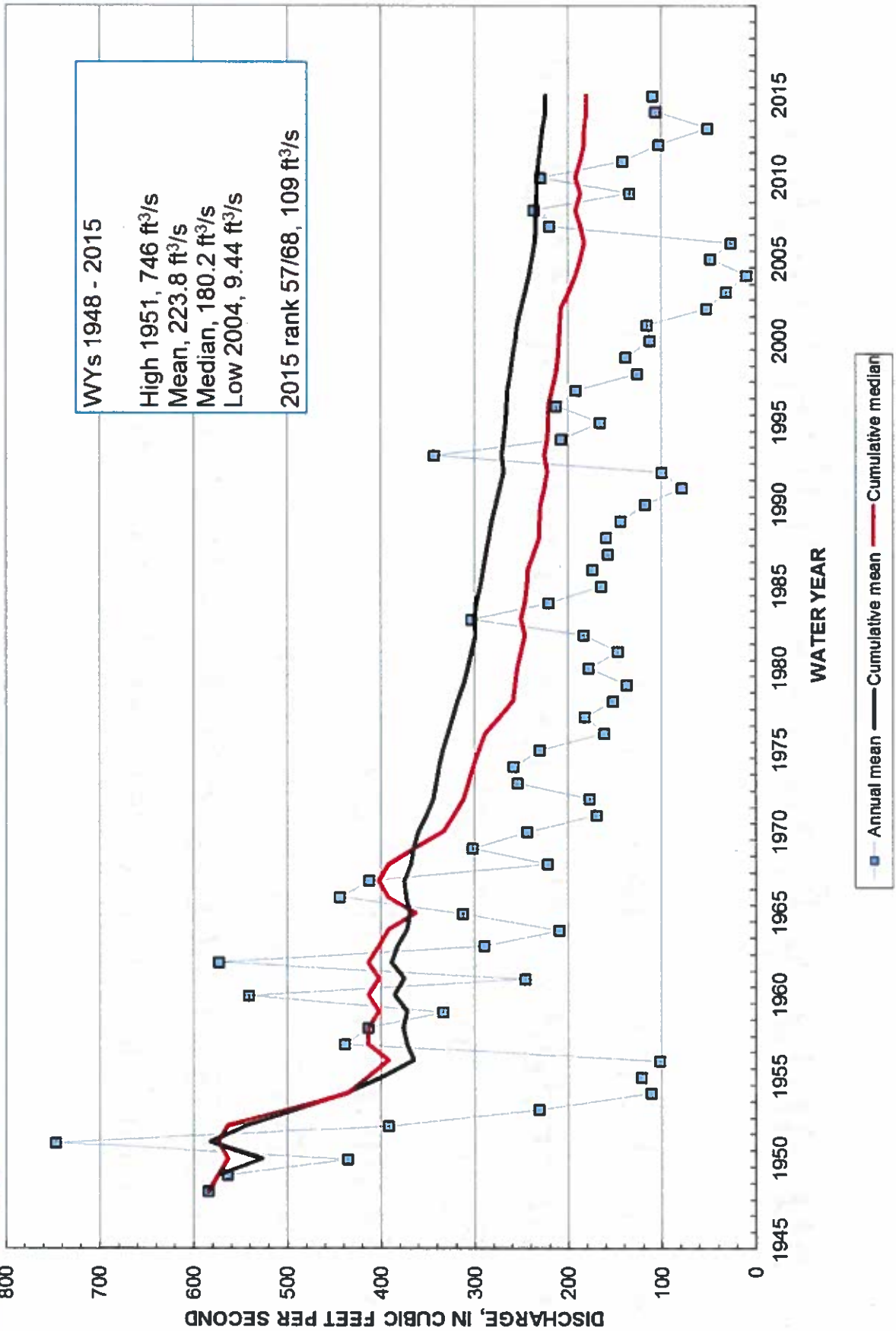


06837000 Republican River at McCook, NE





06844500 Republican River near Orleans, NE



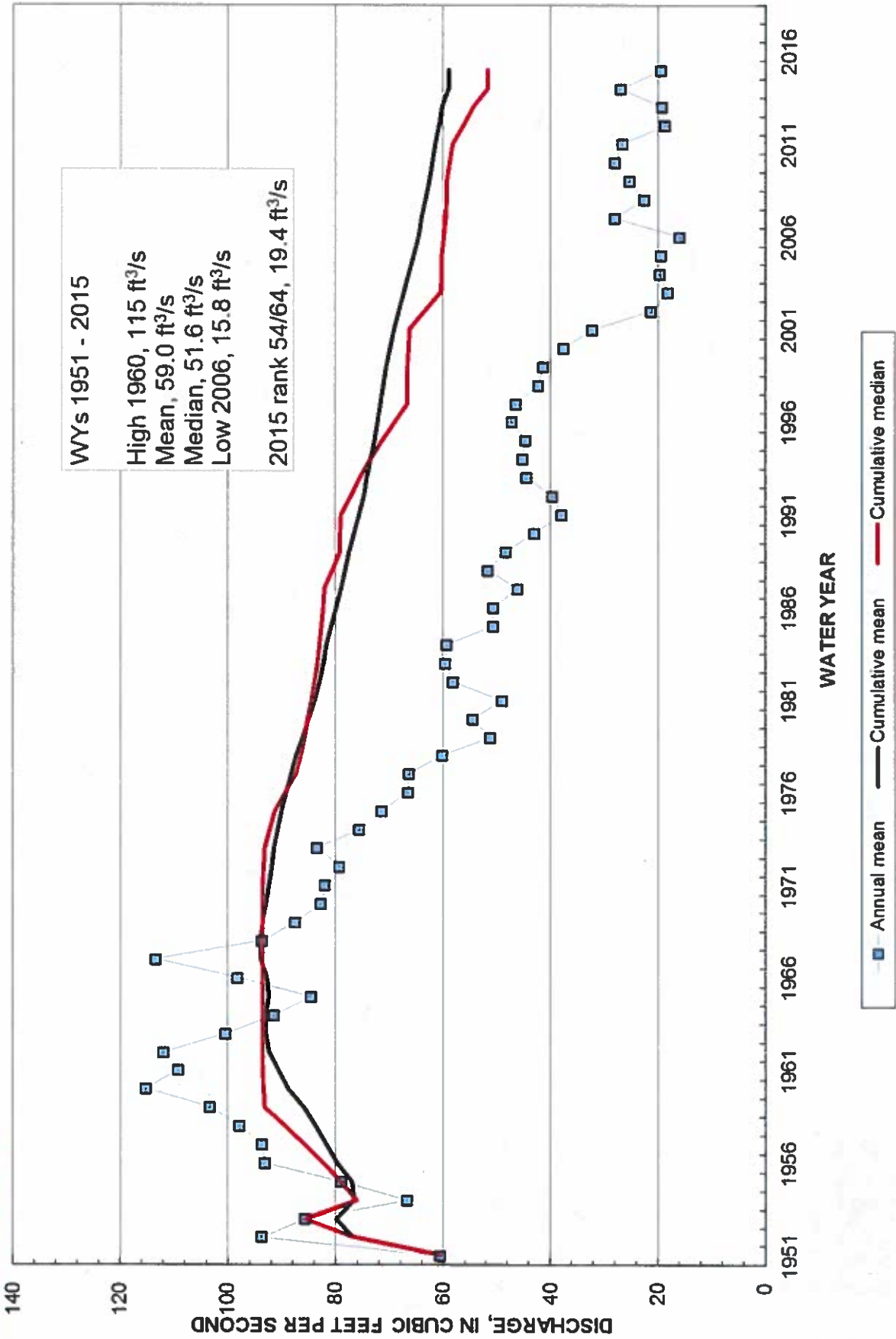
Summary Charts – NDNR Stations

- Published data for Water Year 2015
- Operated by Nebraska Department of Natural Resources (NDNR)
- Stations funded by:
 - NDNR – Field operation
 - USGS, USACE, and NDNR – DCP support, Web display, data review, and publication by USGS



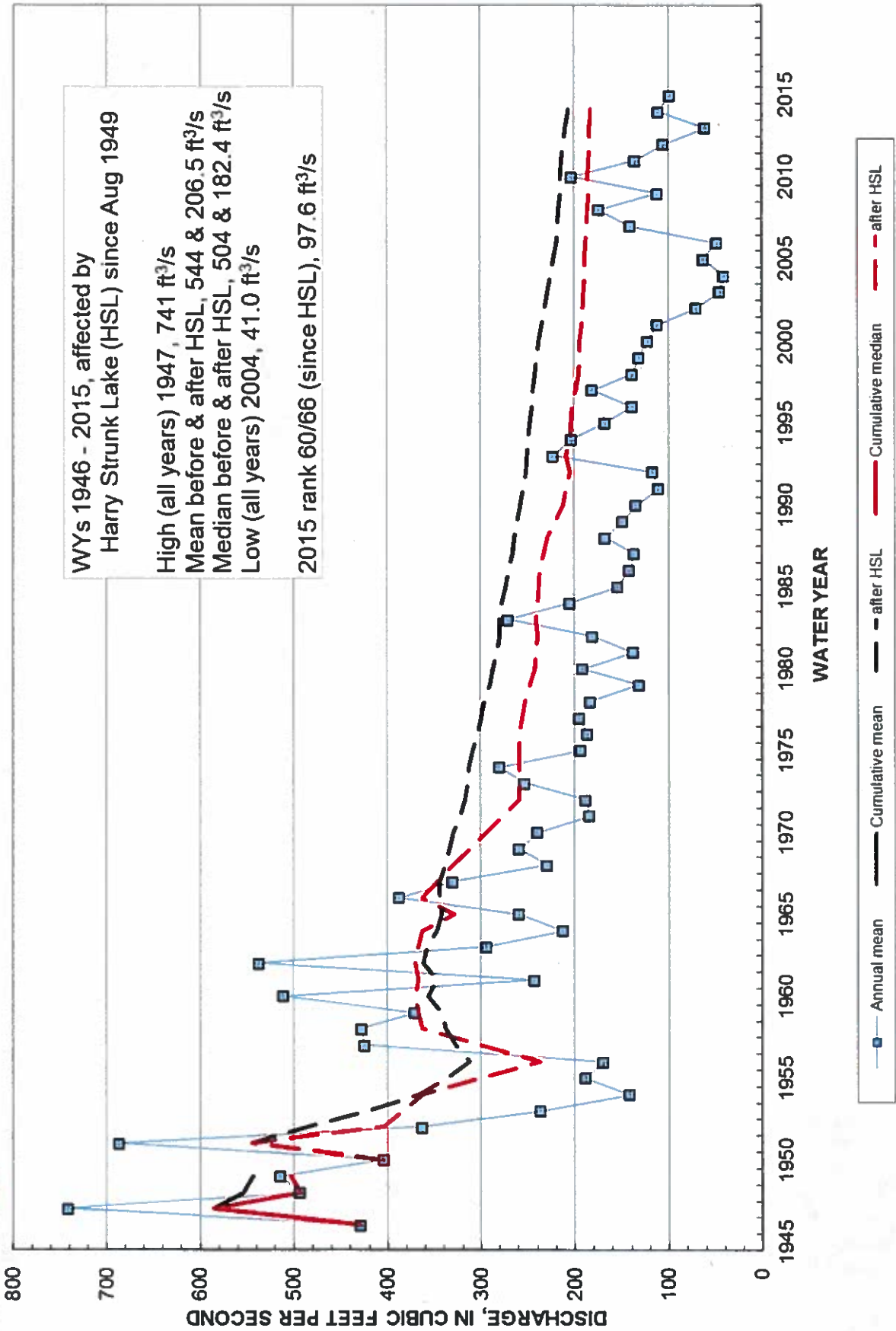


06834000 Frenchman Creek at Palisade, NE





06843500 Republican River at Cambridge, NE



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Engineering Committee Report

Republican River Compact Administration

August 24, 2016

EXECUTIVE SUMMARY

The Engineering Committee (EC) met four times since last August's Republican River Compact Administration (RRCA) Annual Meeting. Over the past year, the EC completed these assignments: 1) holding quarterly meetings and 2) exchanging information listed in Section V of the RRCA Accounting Procedures and Reporting Requirements, including all required data and documentation and 3) drafting a letter to the USGS to discuss finalized gage data by April 15 of each year.

Ongoing assignments include 1) continuing efforts to resolve concerns related to varying methods of estimating ground and surface water recharge and return flows and related issues, 2) continuing to finalize accounting for 2006-2015, 3) working to resolve issues preventing agreement on final accounting for 2006-2014, 4) discussing developing an application and approval process for future augmentation plans, 5) exploring options for sharing evaporation charges for Harlan County Lake, 6) Assign responsibility for collecting specific fields of data collected for the annual data exchange, 7) create a document memorializing when RRCA Accounting Procedures have changed over the years and incorporated it into the Accounting Procedures.

The EC recommends discussion by the RRCA on the exchange of data and documentation and the modeling runs completed by Principia Mathematica for 2015, discussion of Nebraska's proposal to revise the RRCA Accounting Procedures and Reporting Requirements, and the recommended EC assignments for the following year.

Details of the various EC tasks are described further in the remainder of this report, including as attachments, the EC meeting notes.

COMMITTEE ASSIGNMENTS AND WORK ACTIVITIES RELATED TO THESE ASSIGNMENTS

1. Meet quarterly to review the tasks assigned to the committee.
 - a. Assignment completed.
 - b. The EC held four meetings since the August 2015 RRCA Annual Meeting. Notes from the four EC meetings are attached: November 16, 2015 (Attachment 1), February 18, 2016 (Attachment 2), April 28, 2016 (Attachment 3), and July 7, 2016 (Attachment 4).
2. Exchange by April 15, 2016, the information listed in Section V of the RRCA Accounting Procedures and Reporting Requirements, and other data required by that

document, including all necessary documentation. By July 15, 2016, the states will exchange any updates to these data.

- a. Assignment completed.
 - b. Kansas, Nebraska, and Colorado posted preliminary data by April 15, 2016. The status and details of the preliminary data exchange was discussed at the April 28 and July 7, 2016, EC meetings (Attachments 3 and 4). Nebraska posted final data on April 15, May 26, and July 7, 2016, and Kansas posted final data on June 8, 2016. The Colorado procedure for 2015 uses the metered pumping for those wells covered by the Metering Rules with acreage data from 2010. Wells without meter records in parts of two counties use average application rates from Kit Carson County along with the acreage associated with each well. Due to data availability issues Colorado's CIR based estimate of pumping was not distributed. The pumping estimate will be distributed when it is complete.
 - c. In advance of the July 2016 meeting, Willem Schreüder of Principia Mathematica executed the most recent model run for 2015 using full-year temperature and precipitation data, river data, and pipeline information. He also executed a preliminary model run for 2016 using temperature data, long-term average precipitation data, 2015 evaporation data, river data, and pipeline information. This information has been posted to the RRCA website.
 - d. The Committee continued to discuss updating documentation of the modeling processes. Principia Mathematica will continue to update the modeling process documentation. The write-up for the update will have two versions of the processing programs: 2001 to 2006 and 2007 skipping intermediate steps and describing the current version of the model (5 run).
3. When possible, 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.
 - a. Assignment ongoing.
 - b. Kansas is working on a scope and needs document for this task regarding changes in irrigation efficiency through time.
 4. When possible, continue efforts to finalize accounting for 2006-2015.
 - a. Assignment ongoing.
 - b. The EC discussed and analyzed Schreüder's "SWinputs Spreadsheet" in order to determine the most suitable inputs for the years 1996-2015.
 5. Work to resolve issues preventing agreement on final accounting for 2006-2015, as identified in the 2015 EC Report. These issues include:
 - a. Kansas's request for beginning and ending meter data from other states.
 - i. Assignment ongoing.

- ii. Kansas is reviewing Colorado's annual meter data for 2015. Colorado's 2012, 2013, and 2014 meter data are now available on the RRCA website. As Colorado has no meter data older than 2012, Kansas is examining how the 2012-2015 data correspond with the 75 percent Crop Irrigation Requirement assumption.
 - b. Reaching consensus about how to model Bonny Reservoir.
 - i. Assignment ongoing.
 - ii. Kansas and Colorado discussed this issue in ongoing confidential conversations, the EC deferred discussion of this assignment.
6. Discuss any accounting changes that may be needed for surface water diversions for the purpose of recharging groundwater, as data become available from Nebraska projects.
 - a. Assignment ongoing.
 - b. Nebraska submitted a proposal for changes to the RRCA Accounting Procedures and Reporting Requirements document, which included changes to Attachment 7 of the document for Percent Field and Canal Loss that Returns to Stream for the Non-Irrigation Season. This proposal is available as Attachment A to the July 7 EC Minutes (Attachment 5). The EC discussed this proposal briefly at the July 7, 2016 meeting.
7. When possible, discuss developing an application and approval process for future augmentation plans.
 - a. Assignment not completed.
 - b. Due to ongoing consideration of this topic at Three-States meetings throughout the year, the EC deferred discussion of this assignment.
8. Continue to explore options for sharing evaporation charges for Harlan County Lake when accounts exist separate from the project water supplies of Bostwick Irrigation District and explore potential means to adjust the compact accounting of Harlan County Lake for the mutual benefit of the States.
 - a. Assignment not completed.
 - b. Kansas and Nebraska have discussed the issues related to calculating the incremental increase in reservoir areas, and they are close to being resolved. Discussion of these issues will continue at Three-States meetings.
9. Assign responsibility for collecting specific fields of data collected for the annual data exchange by determining who has the best available data and assigning them the responsibility of populating those fields in order to avoid confusion between multiple datasets.
 - a. Assignment ongoing.
 - b. The EC is utilizing the SWInputs Spreadsheet to collaborate and agree upon which source/state has the responsibility of populating data fields.
10. Draft a letter to the USGS to discuss how the RRCA can get finalized gage data by April 15 of each year.

- a. Assignment complete.
 - b. The RRCA Chair drafted a letter dated February 24, 2016 to the USGS requesting timely gage data. A phone conversation took place on April 6, 2016 between RRCA staff and the USGS to field questions related to the request. A letter dated April 13, 2016 was received from USGS acknowledging their understanding of the request and agreeing to provide support. The RRCA chair replied by letter dated May 16, 2016 acknowledging the understanding that was reached and thanking the USGS. All letters are included with this report as Attachment 6.
11. Create a document memorializing when RRCA Accounting Procedures have changed over the years and incorporated it into the Accounting Procedures
 - a. Assignment ongoing.
 - b. Kansas is spearheading this document and the work has yielded a draft document that was presented to the EC during the July 7 meeting. The draft document is broken out into Accounting Procedure changes, Model Update and Resolution Action, and how the document is kept current.

OTHER COMMITTEE ACTIVITIES

1. Updates on the status of the development and review of RRCA annual reports for 2014, and 2015 were given by the states at each quarterly EC meeting.
2. Nebraska reminded the EC that moving forward only the Medicine Creek gage data would be maintained by Nebraska. The Beaver and Guide Rock gages were formerly maintained by Nebraska and will now be managed by the USGS.
3. The EC discussed Nebraska's 2016 water administration during each quarterly meeting. This is a Compact Call Year, but the N-CORPE and Rock Creek augmentation projects will provide water for the forecasted water shortage quantity.
4. Kansas suggested that the RRCA develop an administrative website that would be an informational page for the general public. Kansas has developed a draft to share with the EC for discussion and requested feedback from other states.
5. Nebraska has developed a new method for tracking non-federal reservoirs. The new method was described in a write-up prepared by Nebraska, dated November 13, 2015, and was discussed at the February 18th EC meeting. Kansas and Colorado agreed that the new methodology was suitable for use and Nebraska will continue to use the methodology for years 2013-present. This is included as Attachment #7.
6. The EC elected to form an ad hoc subcommittee between members of each state to discuss details surrounding the SWInputs spreadsheet and the origins of data populating said spreadsheet.

ITEMS FOR RRCA DISCUSSION & ACTION

Based upon the EC discussions and information presented in this report, the EC recommends RRCA discussion and potential action on the following items:

1. Agreement that the Data Exchange & Modeling Results for 2015 were performed. The EC has examined the data exchanged and the results from Principia Mathematica and agrees that the 2015 modeling runs are complete.
2. Discussion and direction on the specific modeling and data tasks to be assigned to Principia Mathematica for 2016.
3. Discussion of Nebraska's proposal to revise the RRCA Accounting Procedures and Reporting Requirements as well as Attachment 7 to account for non-irrigation season canal diversions intended for aquifer recharge purposes.
4. Discuss the continuation of efforts to draft and develop an RRCA administrative website that would be an informational page for the general public.
5. Discussion of the recommended EC assignments and other potential assignments for the next year and agreement on a final set of assignments. The EC presents the list of 12 items in this report as recommended assignments to report on at the 2017 annual meeting of the RRCA.

RECOMMENDED ASSIGNMENTS FOR THE COMING YEAR

The Engineering Committee recommends that the Republican River Compact Administration assign the following tasks:

1. Meet quarterly to review the tasks assigned to the committee.
2. Exchange by April 15, 2017, the information listed in Section V of the RRCA Accounting Procedures and Reporting Requirements, and other data required by that document, including all necessary documentation. By July 15, 2017, the states will exchange any updates to these data.
3. When possible, 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. Continue efforts to finalize all accounting for years since 2006. Issues between the states currently include:
 - a. Kansas's request for beginning and ending meter data from other states.
 - b. Agreement on appropriate Surface Water Inputs.
 - c. Reaching consensus on how to model Bonny Reservoir.
5. Continue work to assign responsibility for collecting specific fields of data collected for the annual data exchange by determining who has the best available data and assigning them the responsibility of populating those fields in order to avoid confusion between multiple datasets.

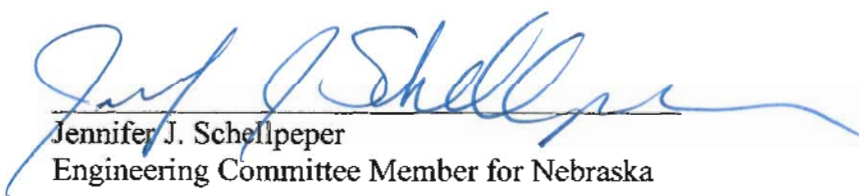
6. Continue work on creating a document memorializing when RRCA Accounting Procedures have changed over the years and incorporate it into the Accounting Procedures.
7. When possible discuss developing an application and approval process for future augmentation plans.
8. Continue to explore options for sharing evaporation charges for Harlan County Lake when accounts exist separate from the project water supplies of Bostwick Division and explore potential means to adjust the compact accounting of Harlan County Lake for the mutual benefit of the States.
9. Continue efforts to develop and publish an administrative website that would be an informational page for the general public.
10. By December 31, 2016 unify accounting procedures and reporting requirements approved by all RRCA resolutions including determining the appropriate model run or runs to be performed by Principia Mathematica.
11. Continue work and provide future update on improving accounting tools developed by the Engineering Committee.

The Engineering Committee Report and the exchanged data will be posted on the web at www.republicanrivercompact.org.

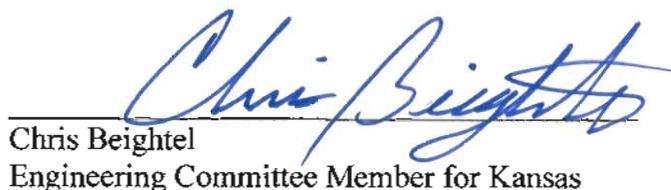
SIGNED BY



Ivan Franco
Chair, Engineering Committee Member for Colorado



Jennifer J. Schellpeper
Engineering Committee Member for Nebraska



Chris Beightel
Engineering Committee Member for Kansas

Final Meeting Notes for the
**QUARTERLY MEETING of the
ENGINEERING COMMITTEE of the
REPUBLICAN RIVER COMPACT ADMINISTRATION**
November 16th, 2015, 12:30 PM Mountain, 1:30 PM Central

Attendees:

Ivan Franco	Colorado	Chris Beightel	Kansas
Willem Schreuder	Principia Mathematica	Chelsea Erickson	Kansas
Jesse Bradley	Nebraska		
Michael Ou	Nebraska		
Carol Flaute	Nebraska		
Jennifer Schellpeper	Nebraska		
David Kracman	The Flatwater Group		
Chance Thayer	The Flatwater Group		

1. Introductions
2. Review/Modify Agenda
 - a. No changes to the agenda
3. Publication of RRCA Annual Reports
 - a. 2014 Reports (Nebraska)
 - i. December 2013 Special - Documents under review with Colorado
 - ii. August 2014 Annual – Documents under review with Colorado
 - b. 2015 Reports (Nebraska)
 - i. October 2014 – Documents under review with Kansas
 - ii. November 2014 – Documents under review with Kansas
 - iii. March 2015 – Being prepared by Nebraska
 - iv. August 2015 Annual - Being prepared by Nebraska
4. Modeling and Data Tasks for Principia Mathematica
 - a. Documentation
 - i. No additional progress from Schreuder on this issue.
5. Non-Federal Reservoir Tracking (Nebraska)
 - a. Previously Nebraska proposed to prepare a write-up of the methodology utilized in their quantification of Non-Federal Reservoirs. Bradley plans on distributing the methodology write up after the meeting.
6. Data Exchange
 - a. 2014 Accounting
 - i. Bradley noted that gross M&I pumping totals were included in the data exchange instead of net pumping. The updated net pumping numbers were submitted to Schreuder and were incorporated into a model update done October 20th.

- b. 2015 Accounting
 - i. Nebraska will continue to provide monthly updates moving forward. One more update likely before year's end. Schreuder noted that he is repeating pumping for 2014 in the 2015 and 2016 projections. Schreuder stated that if anyone has a suggestion for what they think is a better a way of making pumping estimates for 2015 and 2016, he is interested in hearing about it. Also, Schreuder noted that he runs preliminary accounting scenarios (html) on his website and inquired as to whether this would be of value to the other states.
 - ii. Plan to make a request to USGS to report annual gage flow on calendar year rather than water year.
 - c. 2016 Accounting
 - i. Schreuder would like to see a streamlined process considered.
 - d. Finalization of 2015 and previous years accounting
 - i. List of issues preventing finalization of accounting – no change here
 - ii. 1995-2014 accounting spreadsheet from Schreuder –
 - 1. Beightel noted that Kansas has looked at the data and staff has prepared follow up questions regarding some minor discrepancies.
 - 2. Bradley noted that Nebraska gauge data (Medicine Creek, Beaver Creek, Guide Rock), are all complete and final through 2013. Any discrepancies may be the result of confusion between older data and the finalized data.
 - 3. Moving forward Medicine Creek will be the only gauge Nebraska is operating (Bradley). The USGS will be operating the other two gauges (Beaver Creek, Guide Rock). The Nebraska data moving forward will be available on Nebraska's website. Schreuder asked whether he could automate the process of grabbing the data from the website. Bradley replied that it would be possible, but Schreuder would have to wait until Nebraska notified him that the data had been worked, so it would probably be easier for Nebraska to just send him the data.
 - 4. KS & NE staff are considering dividing the responsibility of data entry into the accounting spreadsheet. Schreuder will upload the latest version of the spreadsheet to the restricted part of the website so that the states can look at it while considering this suggestion.
7. Estimating Ground and Surface Water Irrigation Recharge and Return Flows
- a. Draft scope and needs document regarding changes in irrigation efficiency (Kansas)
 - i. Kansas reports no further progress on this issue at this time.
8. Accounting changes for Nebraska Groundwater Recharge Project - Non-Irrigation Season Diversions
- a. Accounting change proposal (Nebraska)
 - i. Nebraska plans on drafting new redlines for this proposal given the accounting procedure changes.
 - ii. Beightel reiterated Kansas's concern that 18% of the canal loss may not be entirely due to evaporation. Some of it may be a timing issue related to leaky

canals. Kansas is seeking Nebraska staff's comments on the observation.

9. Future Augmentation Plans

- a. Ongoing discussions at Three-States Meetings
 - i. This continues to be an item for discussion at the 3 states meeting.
 - ii. Bradley provided an update on the N-CORPE project and noted that the project pumped 17,600 acre-feet for 2015. The projection is to pump 30,000 to 32,000 acre-feet for 2016 prior to June 1st. If the forecast holds, the total for 2016 will be close to 50,000 acre-feet.
 - iii. Franco provided the CCP pumping goal of 11,000 acre-feet.

10. Harlan County Lake–Evaporation Charges and Compact Accounting Adjustments

- a. Examples for calculating the incremental increase in reservoir areas
 - i. This issue has evolved out of the Engineering Committee, but may come into play later if there is a permanent Kansas account. Recommended to leave on the agenda for further discussion.
- b. Ongoing discussions at Three-States Meetings
 - i. Bradley plans to distribute the Harlan County Lake agreements and provide Harlan County Lake split spreadsheet to Willem Schreuder. Schreuder noted that typically at the beginning of each month, precipitation data is updated and this is when the model is run. If Schreuder can get surface water projection updates from Nebraska at the same time, a more complete model run can be produced. Bradley and Schreuder agreed to work together to streamline the model updates.

11. Beginning and Ending Meter Data

- a. Review of Colorado Data (Kansas)
 - i. Schreuder sent a comparison to Sam Perkins earlier in the year with Colorado's analysis and comparison of the meter data. Kansas will bring a proposal to the EC outlining Kansas's views on the 2012-2014 Colorado meter data.

12. Modeling Bonny Reservoir

- a. Kansas and Colorado discussions
 - i. 3-States discussing – no update at this time.

13. Creating a New RRCA-oriented Website

- a. Draft administrative website (Kansas)
 - i. Schreuder informed the group that had discussions with David Barfield and Chelsea Erickson regarding the structure of the public webpage and whether using Word Press to produce the page would be a viable option.
 - ii. Beightel reminded the group that Kansas staff are producing the draft copy using WIX because they are less familiar with Word Press.
 - iii. Erickson plans on recirculating a link to the draft website, and the issue will be considered further at the next meeting of the Engineering Committee.

14. Discuss annual data exchange and who has the best available data.

- a. Procedure for populating current year Surface Water inputs

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- i. Schreuder will circulate his stab at who he thinks should be providing surface water data sets. The group will review and discuss at a future meeting of the Engineering Committee.

15. Draft letter to the USGS to discuss finalization of gage data by April 15 of each year (Nebraska).
 - a. Bradley has discussed this issue with Jason Lambrect (USGS). Lambrect indicated that finalizing the data sooner and working it throughout the year is not likely to be a problem; however, as the changes discussed have not yet been implemented, Bradley will reach out to Lambrect again to discuss this informally. In addition, Bradley will draft a letter to the USGS and circulate to the states for review. The group felt it would be most impactful if the letter were signed by the RRCA commissioners.
 - b. Discuss assigning the USGS to provide gage flows by month (Willem)
 - i. This issue is tied to the letter to the USGS.

16. Draft a document memorializing when and how RRCA Accounting Procedures have changed
 - a. Erickson will review the background of this assignment for discussion at future Engineering Committee meetings.

17. Summary of Meeting Actions/Assignments
 - a. Bradley will draft a letter to the USGS addressing the RRCA's need for a timely finalization of annual gauge data.
 - b. Nebraska will provide a write-up on methodology of Non-Federal Reservoir Tracking.
 - c. Kansas will provide a proposal on how 2012-2014 Colorado meter data should be used in the model runs for those years.
 - d. Schreuder will distribute a version of his Surface Water spreadsheet with his opinion on who should be providing certain data.
 - e. Schreuder will post a copy of the draft accounting spreadsheet to the website so everyone can evaluate whether the states want to start doing it as part of the model update process.
 - f. Erickson will distribute the draft copy of the website prepared by Kansas.
 - g. Erickson will review the background for memorializing how RRCA Accounting Procedures have changed in recent years.
 - h. Kansas will provide a response to Nebraska's proposal to adjust the canal loss factor for winter operations.

18. Future Meeting Schedule
 - a. The next meeting of the RRCA Engineering Committee is scheduled for Thursday February 18th, 2016, at 12:30 p.m. Mountain Time by telephone conference.

19. Adjournment
 - a. The meeting adjourned at 1:50 p.m.

Final Meeting Notes for the
**QUARTERLY MEETING of the
ENGINEERING COMMITTEE of the
REPUBLICAN RIVER COMPACT ADMINISTRATION**
February 18th, 2016, 12:30 PM Mountain, 1:30 PM Central

Attendees:

Ivan Franco	Colorado	Chance Thayer	The Flatwater Group
Willem Schreuder	Principia Mathematica	Chelsea Erickson	Kansas
Jesse Bradley	Nebraska	Chris Beightel	Kansas
Mahesh Pun	Nebraska		
Zablon Adane	Nebraska		
Kari Burgert	Nebraska		
Jennifer Schellpeper	Nebraska		
Kathy Benson	Nebraska		
David Kracman	The Flatwater Group		

1. Introductions
2. Review/Modify Agenda
 - a. No changes to the agenda
3. Publication of RRCA Annual Reports
 - a. 2014 Reports (Nebraska)
 - i. December 2013 Special - Review complete by all states
 - ii. August 2014 Annual – Review complete by all states
 - b. 2015 Reports (Nebraska)
 - i. October 2014 – Review complete by all states
 - ii. November 2014 – Review complete by all states
 - iii. March 2015 – transcripts out for review/ waiting on Colorado
 - iv. August 2015 Annual - transcript sent out/ minutes going out soon
4. Modeling and Data Tasks for Principia Mathematica
 - a. Documentation
 - i. Willem made some progress since the last meeting and had the following question: In the re-run of the model from 2007 onward, Willem used the latest version of the processing program (5 run). He pointed out that interim versions of the model exist in which the North Fork accounting point was changed or the Rock creek gage was changed (etc.). He asked if it would be appropriate to document the 2007 version and current versions only, skipping the intermediate steps. It was requested that Willem send an email with his question for consideration by each state.
5. Non-Federal Reservoir Tracking (Nebraska)

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- a. Both Colorado and Kansas reviewed the documentation provided by Nebraska regarding the above topic and are comfortable with the methodology that is in place. Bradley, in response to a question, informed the group that this methodology was in place for the years 2014-2015 and likely 2013 as well. The issue is considered resolved.
6. Data Exchange
- a. 2014 Accounting – No pending issues/Resolved
 - b. 2015 Accounting
 - i. Schreuder pointed out that a recent 2015 preliminary run is posted to the website. He plans another run around the beginning of March.
 - c. 2016 Accounting
 - i. Schreuder is using data projections for the 2016 runs. It was noted that these projections will become more informative in the coming months. Nebraska will have more preliminary accounting data as the 2016 year progresses and will continue to provide monthly updates. Schreuder noted that he is interested in receiving Nebraska's next projection as soon as it is available.
 - ii. Schreuder had a question about how Lovewell Reservoirs contribution is calculated in the accounting for Republican River versus White Rock Creek sources. Kansas will consider the question and provide information.
 - d. Finalization of 2015 and previous years accounting
 - i. List of issues preventing finalization of accounting
 1. No updates.
 - ii. 1995-2014 accounting spreadsheet from Schreuder
 1. Kansas is fine with inputs through 2014 meaning that all states are now in agreement with 1995-2014 inputs. The states will discuss at a future meeting how to best formally approve the inputs.
7. Estimating Ground and Surface Water Irrigation Recharge and Return Flows
- a. Draft scope and needs document regarding changes in irrigation efficiency (Kansas)
 - i. Kansas reports no further progress on this issue at this time. Beightel did indicate that Kansas has planned an internal meeting in early March to discuss this issue and others.
8. Accounting changes for Nebraska Groundwater Recharge Project - Non-Irrigation Season Diversions
- a. Accounting change proposal (Nebraska)
 - i. Beightel inquired as to the volume of water Nebraska is considering each year. Bradley did not have an exact volume, but he did indicate that the diversions would only apply in years when Harlan County Lake is full so volumes might not be too great. An estimate of the recharge volume was approximately 2,000 acre-feet, with 10,000 acre-feet as a likely maximum. These volumes are the amounts estimated to infiltrating into the ground. Bradley noted that there aren't more than 120 days to operate recharge projects during the winter months.
 - ii. Bradley suggested looking to the basin study for volumes that may have been projected as a possible reference.

- iii. Beightel indicated that more direction on this topic from Kansas may be forthcoming after the March internal meeting.

9. Future Augmentation Plans

a. Ongoing discussions at Three-States Meetings

- i. N-CORPE pumping totaled a little over 10,000 acre-feet during 2015 for 2016 compliance. The forecast is 46,000 in the red for 2016 with an understanding that 31,000 needs to be provided, including the carryover from 2015. The 31,000 will be provided by end of April. This forecast will be reassessed in the fall to see if additional pumping is required.
- ii. The plan for Colorado is to have a normal spring with regards to the CCP. A minimum of 4,000 acre-feet is expected by April 1st. As an early projection for 2016, Franco expects a total of 7,000 to be pumped.
- iii. Bradley provided a comment that the Platte River project is in the feasibility phase.
- iv. Beightel asked if the Rock Creek Augmentation project would be pumping in 2016. Bradley informed the group that the project would not operate during the spring of 2016 and it would depend on compliance requirements to determine if fall pumping was required.

10. Harlan County Lake–Evaporation Charges and Compact Accounting Adjustments

a. Examples for calculating the incremental increase in reservoir areas

b. Ongoing discussions at Three-States Meetings

- i. Both of these issues are part of the three state discussions and have evolved out of the Engineering Committee. The two issues may come into play later if there is a permanent Kansas account in Harlan County Lake. Recommended to leave on the agenda.

11. Beginning and Ending Meter Data

a. Review of Colorado Data (Kansas)

- i. Colorado informed the group that 2015 meter data is in the process of being finalized and is expected to be available for release to the other states by the April 15th data exchange. Furthermore, the effort to amend the Republican River Measurement Rules has produced a result in that the new rules should go into effect April 1, 2016. This will bring about 350 well into the metering boundary.
- ii. Colorado is working internally to incorporate 2015 meter data into the ground water pumping estimates for Colorado. It is unclear at this time if that effort will be completed prior to the April 15th data exchange.

12. Modeling Bonny Reservoir

a. Kansas and Colorado discussions

- i. This is part of the three state discussions with no update at this time.

13. Creating a New RRCA-oriented Website

a. Draft administrative website (Kansas)

- i. Nebraska informed the group they were unable to fully review the draft but were planning on meeting internally with new staff members in the near future.

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- ii. Erickson will likely use GoDaddy software to build a polished draft for circulation. GoDaddy was utilized to build the Arkansas River Website and it seemed reasonable to continue its use, if possible. As a reminder it was pointed out that the previous draft was built using WIX.
14. Discuss annual data exchange and who has the best available data.
- a. Procedure for populating current year Surface Water inputs
 - i. Schreuder color coded the spreadsheet for Surface Water Inputs, indicating each states responsibility. The three states will review and discuss at the next meeting.
15. Draft letter to the USGS to discuss finalization of gage data by April 15 of each year (Nebraska).
- a. Discuss assigning the USGS to provide gage flows by month (Willem)
 - i. It was agreed that Franco would coordinate the final draft of the letter with Colorado's commissioner for discussion at the next three state meeting.
16. Draft a document memorializing when and how RRCA Accounting Procedures have changed
- a. A number of changes have taken place to both the approved accounting and model versions since 2010. These changes have been approved both with and without RRCA resolutions. Erickson is taking the lead on drafting a document noting the chain of events which lead to the current version of each.
17. Summary of Meeting Actions/Assignments
- a. Schreuder will email his question regarding model versions from 2007-2015 to the group for consideration.
 - b. Beightel will provide an estimate of Lovewell operations for 2016.
 - c. Erickson will work on putting together a draft document explaining accounting and modeling changes of the past few years.
 - d. Erickson will put together a draft copy of the GoDaddy website.
 - e. Franco will coordinate the finalization of the USGS letter.
 - f. Kansas will provide a proposal on how 2012-2014 Colorado meter data should be used in the model runs for those years.
 - g. Kansas will provide direction to Nebraska regarding what supplemental information would be helpful regarding the Ground Water Recharge Project.
 - h. Franco will complete Colorado's review on the March 2015 meeting transcripts.
18. Future Meeting Schedule
- The next meeting of the RRCA Engineering Committee is scheduled for Thursday April 28, 2016, at 12:30 p.m. Mountain Time by telephone conference.
19. Adjournment
- a. The meeting adjourned at 1:36 p.m. MST.

Final Meeting Notes for
**QUARTERLY MEETING of the
ENGINEERING COMMITTEE of the
REPUBLICAN RIVER COMPACT ADMINISTRATION**
April 28th, 2016, 12:30 PM Mountain, 1:30 PM Central

Attendees:

Ivan Franco	Colorado	Chance Thayer	The Flatwater Group
Willem Schreuder	Principia Mathematica	Jesse Bradley	The Flatwater Group
Jennifer Schellpeper	Nebraska	Chris Beightel	Kansas
Carol Flaute	Nebraska	Sam Perkins	Kansas
Kari Burgert	Nebraska	Honsheng Cho	Kansas
Kathy Benson	Nebraska	Chelsea Erickson	Kansas
Zablon Adane	Nebraska		
Mahesh Pun	Nebraska		

1. Introductions
2. Review/Modify Agenda
 - a. One item added to the agenda:
 - i. Discussion on how address issues caused by incorporating the 2016 Harlan County Lake Resolution into existing accounting.
3. Publication of RRCA Annual Reports
 - a. 2015 Reports (Nebraska)
 - i. October 2014 – Review complete by all states
 - ii. November 2014 - Review complete by all states
 - iii. March 2015 – transcript review complete by all states / minutes going out soon
 - iv. August 2015 Annual – transcript sent out/ minutes going out soon
4. Modeling and Data Tasks for Principia Mathematica
 - a. Documentation
 - i. Schreuder continues to work on this task. No additional progress to report at this time.
 - ii. Beightel requested that a new model run take the place of Dry Bonny/Kansas Method 3. The new model run will be Small Bonny/Kansas Method 3. Beightel requested that the new model run be applied moving forward and be retroactively applied to previous years runs.
5. Data Exchange
 - a. 2015 Accounting
 - i. Schreuder noted that he continues to have questions on Kansas and Nebraska surface water inputs that were provided in the April 15th data exchange. Schreuder noted that the data was in a different format and it was difficult to understand.

- ii. In response to Beightel's question Bradley noted that surface and groundwater commingled acreage that were reported previously were no longer necessary, and this could account for some of the confusion. Additionally, a different method was used for acres primarily outside of the basin. It was agreed that a subcommittee, with a member from each state, would be formed to address these and other questions.
 - iii. Schreuder informed the group the 2010 acreage data was applied to the 2015 meter pumping. Colorado is working on putting together a 2015 acreage data set to apply to meter pumping. Schreuder also informed the group that the model calculates meter totals by cell, and the cells do not exactly line up to county boundaries. These results in county totals that do not exactly match the county geographic boundaries, however the totals are still useful for comparison purposes. Beightel noted that the acreage was higher by some 48,000 acres than in the previous year. Schreuder noted that an updated acreage for 2015 is being compiled and Colorado has taken steps to avoid double counting acres in the 2010 data set and is unsure the source of the additional acres.
 - b. 2016 Accounting
 - i. Schreuder believes he has the data necessary from each state for these calculations. However, he intends to discuss with the surface water subcommittee.
 - c. Finalization of 2015 and previous years accounting
 - i. List of issues preventing finalization of accounting
 - ii. 1995-2014 accounting spreadsheet from Schreuder
 - 1. The group collectively discussed the appropriate method for formally accepting the Surface Water Input spreadsheet. It was agreed that attaching the Surface Water Spreadsheet to the Engineering Report prepared for the 2016 annual meeting would likely be sufficient.
- 6. Estimating Ground and Surface Water Irrigation Recharge and Return Flows
 - a. Draft scope and needs document regarding changes in irrigation efficiency (Kansas)
 - i. Beightel informed the group that work continues on this topic but did not have any further progress to report at this time.
- 7. Accounting changes for Nebraska Groundwater Recharge Project - Non-Irrigation Season Diversions
 - a. Accounting change proposal (Nebraska)
 - i. Kansas has revisited this issue and believes that the proposal is acceptable. However, Kansas would like to see an upper limit of 10,000 acre-feet on these types of projects incorporated into any resolution.
 - ii. Nebraska agreed to consider this limitation and respond at the following Engineering Committee meeting.
 - iii. Beightel mentioned that the 10,000 acre-foot number was included in the Republican Basin Study as an anticipated upper limit.
- 8. Future Augmentation Plans
 - a. Ongoing discussions at Three-States Meetings

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- i. The group did not feel the need to discuss this issue as an update on augmentation plan operations was recently provided by each state.
9. Harlan County Lake–Evaporation Charges and Compact Accounting Adjustments
 - a. Examples for calculating the incremental increase in reservoir areas
 - b. Ongoing discussions at Three-States Meetings
 - i. Both of these issues are part of the three state discussions and have evolved out to of the Engineering Committee. The two issues may come into play later if there is a permanent Kansas account in Harlan County Lake. Recommended to leave on the agenda.
10. Beginning and Ending Meter Data
 - a. Review of Colorado Data (Kansas)
 - i. Franco noted that annual meter data for 2015 was distributed as part of the April 15th data exchange and that the meter data was incorporated into the model run.
 - ii. Beightel indicated that Kansas is still working on reviewing the meter data for 2015.
 - iii. Schreuder made the point that the pumping per acre was less than originally estimated but overall CIR vs Meter data has been pretty close for the years where meter data has been compiled. Specifically, the amount of pumping per acre in the CIR methodology and the applied meter data. Schreuder also noted that in the counties where meter data was not collected, an acre-foot per acre estimate was applied based on the nearest county.
 - iv. Beightel pointed out that the acre-foot/acre estimate may be lower than actual values if the overall acreage needs to be reduced.
11. Modeling Bonny Reservoir
 - a. Kansas and Colorado discussions
 - b. This is part of the three state discussions with no update at this time.
12. Creating a New RRCA-oriented Website
 - a. Draft administrative website (Kansas)
 - i. Erickson notified the group that Kansas has created a GoDaddy account and discovered that additional software (website builder) is required at a cost. Kansas intends to purchase the software and work with each state in the development of the draft website. Erickson had a question about securing the domain name and it seemed likely that regardless of the domain name secured, Schreuder could route the address through the existing website.
 - ii. Franco agreed to work with Erickson along with an, as of yet unnamed, representative from Nebraska on producing a polished draft of the website
 - iii. Beightel noted that this initial work will have to lead to a discussion of operation cost and cost sharing among the states.
13. Discuss annual data exchange and who has the best available data.
 - a. Procedure for populating current year Surface Water inputs
 - i. Schreuder suggested discussing this topic with the subcommittee at a later date.
14. Draft letter to the USGS to discuss finalization of gage data by April 15 of each year (Nebraska).

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- a. Discuss assigning the USGS to provide gage flows by month (Willem)
 - i. Franco informed the group that a phone conversation took place on April 6th with USGS staff to answer questions regarding the February 24, 2016 RRCA request letter. The USGS agreed to deliver data on a provisional level by the 5th of each month and final annual data by April 1st of each year. The USGS sent a letter dated April 13, 2016 confirming their understanding.
 - ii. Beightel commented that the USGS response was unclear.
 - iii. Franco will draft a letter in response, explicitly stating what the USGS would be providing, closing the loop on the matter.

15. Draft a document memorializing when and how RRCA Accounting Procedures have changed
 - a. Erickson has completed a large portion of this work and is preparing to distribute to the group. Erickson had a question on how small of a change was too small to be included in the document. The group collectively agreed that including the data in question was appropriate but changes to preprocessors were too small of an issue to include.

16. Discussion on how address issues caused by incorporating the 2016 Harlan County Lake Resolution into existing accounting
 - a. Schellpeper distributed two draft spread sheets showing the potential effects of implementing the 2016 HCL Resolution. It was noted that pumping intended to be credited towards the 2016 calendar year could take place in 2015 or 2017. The accounting sheets are designed to account for all pumping in each calendar year, thus requiring some change.
 - b. Bradley noted that the group needed to come to an agreement on the proper way to account for Nebraska's augmentation pumping such that the accounting balance for 2015/2017 is unaffected by pumping during that year intended for 2016 use.
 - c. Beightel asked if the depletions are accounted for in the actual year of pumping. Bradley confirmed that they did and no amendment to the depletions was being proposed.
 - d. The group agreed to discuss the issue in further detail following the next three states meeting at the end of May.

17. Summary of Meeting Actions/Assignments
 - a. Kansas and Nebraska will designate one or more people to participate in a subcommittee to discuss surface water data exchange issues (and other issues).
 - b. Schreuder will work on incorporating a Small Bonny/Kansas Method 3 run to replace No Bonny/Kansas Method 3.
 - c. Franco will draft a response letter to the USGS.
 - d. Franco will investigate a meeting location for discussion after the three state meeting
 - e. Nebraska will consider the 10,000 acre-foot limitation for Groundwater Recharge projects.
 - f. Erickson will work with website subcommittee to produce in initial draft RRCA website.
 - g. Erickson will distribute for review/input the draft document memorializing the RRCA Accounting changes.

18. Future Meeting Schedule

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- The next meeting of the RRCA Engineering Committee is scheduled for July 7, 2016, at 12:30 P.M. MST by telephone conference.

19. Adjournment

- a. Adjourned at 1:45 p.m. MST

Final Meeting Notes for
**QUARTERLY MEETING of the
ENGINEERING COMMITTEE of the
REPUBLICAN RIVER COMPACT ADMINISTRATION**
July 7th, 2016, 12:30 PM Mountain, 1:30 PM Central

Attendees:

Ivan Franco	Colorado	Chance Thayer	The Flatwater Group
Willem Schreuder	Principia Mathematica	Jesse Bradley	The Flatwater Group
Jennifer Schellpeper	Nebraska	Chris Beightel	Kansas
Mahesh Pun	Nebraska	Sam Perkins	Kansas
Kari Burgert	Nebraska	Chelsea Erickson	Kansas
Kathy Benson	Nebraska	David Barfield	Kansas
Zablon Adane	Nebraska	Craig Scott	USBR

1. Introductions
2. Review/Modify Agenda
 - a. No changes to the agenda
3. Publication of RRCA Annual Reports
 - a. 2015 Reports (Nebraska)
 - i. October 2014 – Review complete by all states
 - ii. November 2014 – Review complete by all states
 - iii. March 2015 – transcripts reviewed by all states/ Minutes in preparation
 - iv. August 2015 Annual – transcripts sent out/ minutes going out soon
4. Modeling and Data Tasks for Principia Mathematica
 - a. Documentation
 - i. Schreuder continues to work on this task. No additional progress to report at this time. Schreuder mentioned the likelihood of a final decision on modeling by the RRCA and the benefit of clearer direction for this task.
 - ii. Beightel noted that his request for a Small Bonny/Kansas Method 3 model run had been completed by Schreuder. Beightel asked if the model files associated with those runs were available on the website. Schreuder informed Beightel that the model run files were located on the website under the data section for each year.
5. Data Exchange
 - a. 2015 Accounting
 - i. Schreuder acknowledged that the preliminary accounting on the website is not accurately calculating Canal Return per August 2015 revision to Attachment 7 for spills.

- ii. Schreuder thanked Nebraska staff for providing input on the SWInputs spreadsheet by way of email on July 7, 2016. Schreuder asked if the notes referencing the data source for each column would be static. The consensus was that these notes would likely change somewhat from year to year.
 - iii. The group agreed that 2015 data was very close to being completely finalized but not quite there yet. For example, the stream gage data has some provisional data still being finalized by the USGS.
 - b. 2016 Accounting
 - i. Schreuder sent out his July 6, 2016 update with predicted 2016 model runs. The 2015 data is being used per the norm. The 2016 CCP pumping estimate will be refined in the coming months.
 - c. Finalization of 2015 and previous years accounting
 - i. List of issues preventing finalization of accounting
 - ii. 1995-2014 accounting spreadsheet from Schreuder
 - 1. Franco discussed a number of points regarding the SWInputs spreadsheet. The intent of the spreadsheet is to create one source for accepted surface water inputs to the accounting. The extensive amount of data and recent input from each state has warranted another review of the data for acceptability. It was agreed that each state would continue to review the SWInputs spreadsheet for discussion at the annual meeting.
 - a. Colorado, Nebraska and Kansas all anticipated having slight changes to the current version of the SWInputs spreadsheet. Schreuder committed to implementing the July 7, 2016 update and sending out another version to prevent confusion on which version is being reviewed.
 - 2. Schreuder acknowledged that Sam Perkins provided an extensive number of spreadsheets as part of the subcommittee discussions. Schreuder is still considering what data acquisition changes might be helpful after reviewing the spreadsheets.
 - 3. The group discussed previous years approved accounting and updating the SWInputs spreadsheet for these years. It was agreed that 2006 accounting had been approved and 2007 model inputs had been approved but not the accounting. The 5-run decision will necessitate an amended 2007 model run. The group did not come to a conclusion on updating the SWInput spreadsheet for the years with approved accounting.
 - 4. Beightel asked how the data in the SWInputs spreadsheet was compiled by Schreuder. The methodology of creating the accounting page revolves around data base files which are created based on the individual variable names assigned in the SWInput spreadsheet. This allows the model to be run and the accounting to be updated in a streamlined process. Schreuder will be supplying the program on the website with the SWInput spreadsheet.
- 6. Estimating Ground and Surface Water Irrigation Recharge and Return Flows

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- a. Draft scope and needs document regarding changes in irrigation efficiency (Kansas)
 - i. Beightel informed the group that work continues on this topic but did not have any further progress to report at this time.

7. Accounting changes for Nebraska Groundwater Recharge Project - Non-Irrigation Season Diversions
 - a. Accounting change proposal (Nebraska)
 - i. On July 7, 2016 Nebraska emailed to each state a memorandum and attachments regarding the proposed changes to the Accounting Procedures for non-irrigation season canal recharge diversions. Given the group had not had any time to review the documents, it was agreed that this issue would be discussed at the Engineering Committee workshop at the annual meeting.

8. Future Augmentation Plans
 - a. Ongoing discussions at Three-States Meetings
 - i. The group did not feel the need to discuss at this time as the issue is ongoing at the Three-States meeting.

9. Harlan County Lake–Evaporation Charges and Compact Accounting Adjustments
 - a. Examples for calculating the incremental increase in reservoir areas
 - b. Ongoing discussions at Three-States Meetings
 - i. Both of these issues are part of the Three-States discussions and have evolved out of the Engineering Committee. The two issues may come into play later if there is a permanent Kansas accounting for Harlan County Lake. This is recommended to leave on the agenda.

10. Beginning and Ending Meter Data
 - a. Review of Colorado Data (Kansas)
 - i. Kansas is still working on reviewing and proposing a potential use for the meter data for years where it is available.

11. Modeling Bonny Reservoir
 - a. Kansas and Colorado discussions
 - i. This is part of the Three-States discussions with no update at this time.

12. Creating a New RRCA-oriented Website
 - a. Draft administrative website (Kansas)
 - i. The domain name was purchased by Kansas and a preliminary draft, using Go Daddy software, was presented digitally. Erickson narrated a walkthrough of the draft for the benefit of Nebraska and Colorado. It was agreed that the draft site should not go live as of yet and Kansas would work on a way to allow each state to view the pages for comment.

13. Discuss annual data exchange and who has the best available data.
 - a. Procedure for populating current year Surface Water inputs

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- i. Schreuder and the Surface Water subcommittee met on May 9, 2016 and have had no subsequent meetings. Schreuder pointed out that he received a large amount of data from the other states as a result of this meeting and is still sorting through it. The goal was to find a definitive source for all the data that was provided.
14. Draft letter to the USGS to discuss finalization of gage data by April 15 of each year (Nebraska).
 - a. Agenda item complete. The letters will be attached to the final EC Report.
15. Draft a document memorializing when and how RRCA Accounting Procedures have changed
 - a. Erickson's work on this matter has yielded a draft document. The document was presented digitally with David Barfield presenting a walkthrough of the four main sections. The document will be broken out into Accounting Procedure Changes, Model Updates and Resolution Actions, and how the document is kept current.
 - b. There was some discussion surrounding the 5-run update and how that would be discussed in the document. The overall approach presented by Kansas was acknowledged by the other states as a reasonable way to handle the assignment. A more complete version of the document will be disseminated to Nebraska and Colorado for possible discussion at the annual meeting.
16. Summary of Meeting Actions/Assignments
 - a. Kansas (and Colorado) will review the Groundwater Recharge proposal submitted by Nebraska on July 7, 2016.
 - b. Erickson will distribute (or make available) the draft version of the website for comments, and look into a password protection option.
 - c. An updated version of the SWInput sheet and accounting program will be posted by Schreuder and each state will review for potential future action.
 - d. Nebraska and Colorado will review the draft document memorializing RRCA changes (when made available by Kansas).
 - e. Franco will review the RRCA Rules and Regulations to determine notice requirements for Engineering Committee workshops.
 - f. Franco will have a draft EC report ready for review no sooner than the first week of August.
 - g. Franco will send out an amended save the date for the annual meeting.
17. Future Meeting Schedule
 - No future Engineering Committee meetings scheduled.
18. Adjournment
 - a. Adjourned at about approximately 2 pm MST.

RESOLUTION OF THE REPUBLICAN RIVER COMPACT ADMINISTRATION

REGARDING REQUIRED CHANGES TO THE RRCA ACCOUNTING PROCEDURES AND REPORTING REQUIREMENTS REGARDING NON-IRRIGATION SEASON CANAL DIVERSIONS FOR GROUNDWATER RECHARGE PURPOSES

Whereas, the States of Kansas, Nebraska, and Colorado entered into a Final Settlement Stipulation (“FSS”) as of December 15, 2002, to resolve pending litigation in the United States Supreme Court regarding the Republican River Compact (“Compact”) in the case of *Kansas v. Nebraska and Colorado*, no. 126 Original;

Whereas, the FSS was approved by the United States Supreme Court on May 19, 2003;

Whereas, by memorandum dated May 14, 2015 and provided at the quarterly RRCA Engineering Committee Meeting on that same date, the state of Nebraska introduced the reformed RRCA Accounting Procedures and Reporting Requirements regarding non-irrigation season canal recharge diversions and the estimated percent loss assigned to those diversions.

Whereas, the proposed changes to the RRCA Accounting Procedures and Reporting Requirements shall be enacted for the accounting years 2016 and forward.

NOW THEREFORE BE IT RESOLVED , the Republican River Compact Administration approves and adopts the proposal set forth in Nebraska’s May 14, 2015 memorandum, a copy of which is attached hereto as Exhibit A and incorporated as if the same were set forth fully herein with the exception of the following:

Provision: Non-irrigation season canal recharge diversions shall be limited to 10,000 acre-feet. If canal recharge diversions exceed 10,000 acre-feet, the method established for irrigation season canal diversions shall apply.

Approved by the Republican River compact Administration this 27th day of August, 2015.

Gordon W. Fassett, P.E.
Nebraska Member

Date

David Barfield, P.E.
Kansas Member

Date

Dick Wolfe, P.E.
Colorado Member

Date

DATE: July 7, 2016

TO: Jennifer Schellpeper

FROM: Kari Burgert

SUBJECT: Proposed Changes to the RRCA Accounting Procedures Documentation Regarding Attachment 7 of the August 27, 2015, RRCA Accounting Procedures and Reporting Requirements Document

Executive Summary

The purpose of this Memorandum is to provide documentation of the August 2015 RRCA Accounting Procedures and Reporting Requirements edited to suggest changes to non-irrigation season accounting and Attachment 7 in the document.

Proposed changes to Attachment 7 include editing the spreadsheet to adjust for the Estimated Percent Loss for Column 10 of the original attachment to 92% for diversion which take place during the Non-Irrigation period (October-April).

The following sections provide justification for the proposed changes to the RRCA Accounting Procedures documentation. For the proposed changes, editing the table to adjust for the Percent Field and Canal Loss That Returns to the Stream will result in additions to the specific formulas for each sub-basin and the main stem.

Attachment A of this Memorandum provides an example from the year 2009 using the proposed changes to Attachment 7. Attachment B contains the edited Republican River Compact Administration Accounting Procedures and Reporting Requirements (August 2015) with proposed changes for editing Attachment 7 for Percent Field and Canal Loss that Returns to Stream for the Non-Irrigation Season. Attachment C contains a draft resolution regarding the herein proposed edits.

Edits to Attachment 7 Regarding Column 10, “Percent Field and Canal Loss That Returns to the Stream”

In a previous Memorandum entitled “Documentation of Procedures Producing Charts Depicting Net Evaporation, with Executive Summary of Comparisons between Irrigation and Non-Irrigation Seasons or Months for Reservoirs along the Republican River” and summarized in the Memorandum entitled “Changes to the RRCA Accounting Procedures Documentation Including those Ordered by the U.S. Supreme Court and those Regarding Attachment 7 of the August 12, 2010 RRCA Accounting Procedures and Reporting Requirements Document,” it was determined that during the Irrigation Season (May-September), much greater amounts of water are annually lost to evaporative effects than during the Non-

Irrigation Season (October-April). On an annual basis, an average ratio of Irrigation Season Evaporation to Non-Irrigation Season Evaporation was determined to be 70/30 after analyzing data for the 10-year period from 2004-2013.

Given that the current evaporation rate of 18% (Percent Field and Canal Loss That Returns to the Stream = 82%) applied in Column 10 of Attachment 7 of the RRCA Accounting Procedures document is a seasonal value normally used for diversion during the Irrigation season and that the ratio of Irrigation Season to Non-Irrigation Season is equal to 70/30, the following derivation can be implied to determine an appropriate value for the evaporation rate (1-Percent Field and Canal Loss That Returns to the Stream) during the Non-Irrigation Seasons.

Derivation of Non-Irrigation Season Evaporation Rate:

X = Irrigation Season Evaporation Rate (18%)

Y = Non-Irrigation Season Evaporation Rate (___%)

70/30 = Ratio of Irrigation Season to Non-Irrigation Season Evaporation Rates

Where,

$X/Y = 70/30$

And

$Y = X / (70/30)$

Therefore,

$Y = 0.18/(70/30)$

And simplifying,

Y = 0.077

From this derivation, it can be implied then that if Column 10 of Attachment 7 = 82% (1-0.18) for the Irrigation Season, Column 10 of Attachment 7 would then equal 92% (1-0.077) for the Non-Irrigation Season.

Calculations for each canal must then be broken down according to Irrigation Season diversions and Non-Irrigation Season diversion. For Non-Irrigation Season calculations, Column 5 “Field Deliveries” will always be zero, since water is not diverted for field use. As shown in the following example in Attachment B for the year 2009, we will assume a Canal Diversion value of 100 Ac-ft. SWW of 0 Ac-ft., Field Deliveries of 0 Ac-ft., and an Average Field Loss factor of (30%).

Because Column 5 is equal to zero, Column 6 “Canal Loss” will be equal to the original diversion amount minus Column 3 “Spill to Waste-way (SWW)”, and Column 8 “Field Loss” will be zero. Therefore, Column 9 “Total Loss from District” will be equal to the original diversion amount minus Column 3 “SWW”.

Then, Column 11 “Total Return to Stream from Canal and Field Loss” is equal to Column 9 “Total Loss from District” multiplied by the value present in Column 10 (92%) plus Column 3 “SWW.”

Finally, it is then implied that Column 12 “Return as Percent of Canal Diversion” (%BRF) will be equal to the Column 11 value divided by the original diversion amount. %BRF, or Percent of Diversion from Bureau Canals that returns to the Stream (Column 12), is the only value from Attachment 7 which is represented in §IV.B of the RRCA Accounting Procedures document. Therefore, the changes to Attachment 7 must be reflected when calculating the specific formulas for each sub-basin and the main stem. Edits to the formulas must be made to implement this data into the accounting process.

The following example formula from §IV.B #8 of the RRCA Accounting Procedures document for Frenchman Creek in Nebraska depicts the necessary formula additions need to calculate CBCU Nebraska.

$$\text{CBCU Nebraska} = \text{Culbertson Canal Diversion (IRR Season)} \times (1 - \% \text{BRF}) + \text{Culbertson Canal Diversions (Non-IRR Season)} \times (1 - 92\%) + \text{Culbertson Extension (IRR Season)} \times (1 - \% \text{BRF}) + \text{Culbertson Extension (Non-IRR Season)} \times (1 - 92\%) + 0.6 \times \text{Champion Canal Diversion} + 0.6 \times \text{Riverside Canal Diversion} + 0.6 \times \text{Dn} + \% \times \text{Pn} + 0.5 \times \text{M\&In} + \text{EvNFRn} + \text{Enders Reservoir Ev} + \text{GWn}$$

This correction should be applied to all CBCU Nebraska calculations for Sub-Basins and Main-Stem in §IV.B of the RRCA Accounting Procedures document.

A copy of the RRCA Accounting Procedures and Reporting Requirements (August 2015) document containing the proposed changes for editing Attachment 7 for Percent Field and Canal Loss that Returns to Stream for the Non-Irrigation Season can be found in Attachment B.

Conclusions and Final Documentation

Attachment A of this Memorandum provides an example from the year 2009 using the proposed changes to Attachment 7. Attachment B contains the edited Republican River Compact Administration Accounting Procedures and Reporting Requirements (August 2015) with proposed changes for editing Attachment 7 for Percent Field and Canal Loss that Returns to Stream for the Non-Irrigation Season. Attachment C contains a draft resolution regarding the herein proposed edits.

Attachment A

Attachment 7: Calculations of Return Flows from Bureau of Reclamation Canals

Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8	Col 9	Col 10	Col 11	Col 12
Canal	Canal Diversion	Spill to Waste-way	Net Diversion	Field Deliveries	Canal Loss	Average Field Loss Factor	Field Loss	Total Loss from District	Percent field and Canal Loss That Returns to the Stream	Total return to Stream from Canal and Field Loss	Return as Percent of Canal Diversion
Name Canal	Headgate Diversion	Sum of measured spills to river	Col 2 - Col 3	Sum of deliveries to the field	Col 4 – Col 5	1 – Weighted Average Efficiency of Application System for the District*	Col 5 x Col 7	Col 6 + Col 8	Estimated Percent Loss*	Col 9 x Col 10 + Col 3	Col 11 / Col 2
∑ Irrigation Season											
∑ Non-Irrigation Season											
Example	100	5	95	60	35	30%	18	53	82%	48	48%
	100	5	95	0	95	30%	0	95	92%	87.4	87%
Culbertson						30%			82%		
						30%			92%		
Culbertson Extension						30%			82%		
						30%			92%		
Meeker - Driftwood	23,274		23,274	5,603	17,671	30%	1,681	19,352	82%	15,869	68%
	3,491	0	3,491	0	3,491	30%	0	3,491	92%	3,212	92%
Red Willow						30%			82%		
						30%			92%		
Bartley						30%			82%		
						30%			92%		
Cambridge						30%			82%		
						30%			92%		
Naponee						35%			82%		
						35%			92%		
Franklin						35%			82%		
						35%			92%		
Franklin Pump						35%			82%		
						35%			92%		
Almena						30%			82%		
Superior						31%			82%		
						31%			92%		
Nebraska Courtland						23%			82%		
Courtland Canal Above Lovewell (KS)						23%			82%		
Courtland Canal Below Lovewell						23%			82%		

*The average field efficiencies for each district and percent loss that returns to the stream may be reviewed and, if necessary, changed by the RRCA to improve the accuracy of the estimates.

Republican River Compact Administration

ACCOUNTING PROCEDURES AND REPORTING REQUIREMENTS

Revised August 27, 2015

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Introduction

This document describes the definitions, procedures, basic formulas, specific formulas, and data requirements and reporting formats to be used by the RRCA to compute the Virgin Water Supply, Computed Water Supply, Allocations, Imported Water Supply Credit and Computed Beneficial Consumptive Use. These computations shall be used to determine supply, allocations, use and compliance with the Compact according to the Stipulation. These definitions, procedures, basic and specific formulas, data requirements and attachments may be changed by consent of the RRCA consistent with Subsection I.F of the Stipulation. This document will be referred to as the RRCA Accounting Procedures. Attached to these RRCA Accounting Procedures as Figure 1 is the map attached to the Compact that shows the Basin, its streams and the Basin boundaries.

II. Definitions

The following words and phrases as used in these RRCA Accounting Procedures are defined as follows:

Additional Water Administration Year - a year when the projected or actual irrigation water supply is less than 130,000 Acre-feet of storage available for use from Harlan County Lake as determined by the Bureau of Reclamation using the methodology described in the Harlan County Lake Operation Consensus Plan attached as Appendix K to the Stipulation.

Allocation(s): the water supply allocated to each State from the Computed Water Supply;

Annual: yearly from January 1 through December 31;

Basin: the Republican River Basin as defined in Article II of the Compact;

Beneficial Consumptive Use: that use by which the Water Supply of the Basin is consumed through the activities of man, and shall include water consumed by evaporation from any reservoir, canal, ditch, or irrigated area;

Change in Federal Reservoir Storage: the difference between the amount of water in storage in the reservoir on December 31 of each year and the amount of water in storage on December 31 of the previous year. The current area capacity table supplied by the appropriate federal operating agency shall be used to determine the contents of the reservoir on each date;

Compact: the Republican River Compact, Act of February 22, 1943, 1943 Kan. Sess. Laws 612, codified at Kan. Stat. Ann. § 82a-518 (1997); Act of February 24, 1943, 1943 Neb. Laws 377, codified at 2A Neb. Rev. Stat. App. § 1-106 (1995), Act of March 15, 1943, 1943 Colo. Sess. Laws 362, codified at Colo. Rev. Stat. §§ 37-67-101 and 37-67-102 (2001); Republican River Compact, Act of May 26, 1943, ch. 104, 57 Stat. 86;

Computed Beneficial Consumptive Use: for purposes of Compact accounting, the stream flow depletion resulting from the following activities of man:

- Irrigation of lands in excess of two acres;
- Any non-irrigation diversion of more than 50 Acre-feet per year;
- Multiple diversions of 50 Acre-feet or less that are connected or otherwise combined to serve a single project will be considered as a single diversion for accounting purposes if they total more than 50 Acre-feet;
- Net evaporation from Federal Reservoirs;
- Net evaporation from Non-federal Reservoirs within the surface boundaries of the Basin;
- Any other activities that may be included by amendment of these formulas by the RRCA;

Computed Water Supply: the Virgin Water Supply less the Change in Federal Reservoir Storage in any Designated Drainage Basin, and less the Flood Flows;

Designated Drainage Basins: the drainage basins of the specific tributaries and the Main Stem of the Republican River as described in Article III of the Compact. Attached hereto as Figure 3 is a map of the Sub-basins and Main Stem;

Dewatering Well: a Well constructed solely for the purpose of lowering the groundwater elevation;

Federal Reservoirs:

- Bonny Reservoir
- Swanson Lake
- Enders Reservoir
- Hugh Butler Lake
- Harry Strunk Lake
- Keith Sebelius Lake
- Harlan County Lake
- Lovewell Reservoir

Flood Flows: the amount of water deducted from the Virgin Water Supply as part of the computation of the Computed Water Supply due to a flood event as determined by the methodology described in Subsection III.B.1.;

Gaged Flow: the measured flow at the designated stream gage;

Guide Rock: a point at the Superior-Courtland Diversion Dam on the Republican River near Guide Rock, Nebraska; the Superior-Courtland Diversion Dam gage plus any flows through the sluice gates of the dam, specifically excluding any diversions to the Superior and Courtland Canals, shall be the measure of flows at Guide Rock;

Historic Consumptive Use: that amount of water that has been consumed under appropriate and reasonably efficient practices to accomplish without waste the purposes for which the appropriation or other legally permitted use was lawfully made;

Imported Water Supply: the water supply imported by a State from outside the Basin resulting from the activities of man;

Imported Water Supply Credit: the accretions to stream flow due to water imports from outside of the Basin as computed by the RRCA Groundwater Model. The Imported Water Supply Credit of a State shall not be included in the Virgin Water Supply and shall be counted as a credit/offset against the Computed Beneficial Consumptive Use of water allocated to that State, except as provided in Subsection V.B.2. of the Stipulation and Subsections III.I. – J. of these RRCA Accounting Procedures;

Main Stem: the Designated Drainage Basin identified in Article III of the Compact as the North Fork of the Republican River in Nebraska and the main stem of the Republican River between the junction of the North Fork and the Arikaree River and the lowest crossing of the river at the Nebraska-Kansas state line and the small tributaries thereof, and also including the drainage basin Blackwood Creek;

Main Stem Allocation: the portion of the Computed Water Supply derived from the Main Stem and the Unallocated Supply derived from the Sub-basins as shared by Kansas and Nebraska;

Meeting(s): a meeting of the RRCA, including any regularly scheduled annual meeting or any special meeting;

Modeling Committee: the modeling committee established in Subsection IV.C. of the Stipulation;

Moratorium: the prohibition and limitations on construction of new Wells in the geographic area described in Section III. of the Stipulation;

Non-federal Reservoirs: reservoirs other than Federal Reservoirs that have a storage capacity of 15 Acre-feet or greater at the principal spillway elevation;

Northwest Kansas: those portions of the Sub-basins within Kansas;

Replacement Well: a Well that replaces an existing Well that a) will not be used after construction of the new Well and b) will be abandoned within one year after such construction or is used in a manner that is excepted from the Moratorium pursuant to Subsections III.B.1.c.-f. of the Stipulation;

RRCA: Republican River Compact Administration, the administrative body composed of the State officials identified in Article IX of the Compact;

RRCA Accounting Procedures: this document and all attachments hereto;

RRCA Groundwater Model: the groundwater model developed under the provisions of Subsection IV.C. of the Stipulation and as subsequently adopted and revised through action of the RRCA;

State: any of the States of Colorado, Kansas, and Nebraska;

States: the States of Colorado, Kansas and Nebraska;

Stipulation: the Final Settlement Stipulation to be filed in *Kansas v. Nebraska and Colorado*, No. 126, Original, including all Appendices attached thereto;

Sub-basin: the Designated Drainage Basins, except for the Main Stem, identified in Article III of the Compact. For purposes of Compact accounting the following Sub-basins will be defined as described below:

North Fork of the Republican River in Colorado drainage basin is that drainage area above USGS gaging station number 06823000, North Fork Republican River at the Colorado-Nebraska State Line,

Arikaree River drainage basin is that drainage area above USGS gaging station number 06821500, Arikaree River at Haigler, Nebraska,

Buffalo Creek drainage basin is that drainage area above USGS gaging station number 06823500, Buffalo Creek near Haigler, Nebraska,

Rock Creek drainage basin is that drainage area above USGS gaging station number 06824000, Rock Creek at Parks, Nebraska,

South Fork of the Republican River drainage basin is that drainage area above USGS gaging station number 06827500, South Fork Republican River near Benkelman, Nebraska,

Frenchman Creek (River) drainage basin in Nebraska is that drainage area above USGS gaging station number 06835500, Frenchman Creek in Culbertson, Nebraska,

Driftwood Creek drainage basin is that drainage area above USGS gaging station number 06836500, Driftwood Creek near McCook, Nebraska,

Red Willow Creek drainage basin is that drainage area above USGS gaging station number 06838000, Red Willow Creek near Red Willow, Nebraska,

Medicine Creek drainage basin is that drainage area above the Medicine Creek below Harry Strunk Lake, State of Nebraska gaging station number 06842500; and the drainage area between the gage and the confluence with the Main Stem,

Sappa Creek drainage basin is that drainage area above USGS gaging station number 06847500, Sappa Creek near Stamford, Nebraska and the drainage area between the gage and the confluence with the Main Stem; and excluding the Beaver Creek drainage basin area downstream from the State of Nebraska gaging station number 06847000 Beaver Creek near Beaver City, Nebraska to the confluence with Sappa Creek,

Beaver Creek drainage basin is that drainage area above State of Nebraska gaging station number 06847000, Beaver Creek near Beaver City, Nebraska, and the drainage area between the gage and the confluence with Sappa Creek,

Prairie Dog Creek drainage basin is that drainage area above USGS gaging station number 06848500, Prairie Dog Creek near Woodruff, Kansas, and the drainage area between the gage and the confluence with the Main Stem;

Attached hereto as Figure 2 is a line diagram depicting the streams, Federal Reservoirs and gaging stations;

Test hole: a hole designed solely for the purpose of obtaining information on hydrologic and/or geologic conditions;

Trenton Dam: a dam located at 40 degrees, 10 minutes, 10 seconds latitude and 101 degrees, 3 minutes, 35 seconds longitude, approximately two and one-half miles west of the town of Trenton, Nebraska;

Unallocated Supply: the “water supplies of upstream basins otherwise unallocated” as set forth in Article IV of the Compact;

Upstream of Guide Rock, Nebraska: those areas within the Basin lying west of a line proceeding north from the Nebraska-Kansas state line and following the western edge of Webster County, Township 1, Range 9, Sections 34, 27, 22, 15, 10 and 3 through Webster County, Township 2, Range 9, Sections 34, 27 and 22; then proceeding west along the southern edge of Webster County, Township 2, Range 9, Sections 16, 17 and 18; then proceeding north following the western edge of Webster County, Township 2, Range 9, Sections 18, 7 and 6, through Webster County, Township 3, Range 9, Sections 31, 30, 19, 18, 7 and 6 to its intersection with the northern boundary of Webster County. Upstream of Guide Rock, Nebraska shall not include that area in Kansas east of the 99° meridian and south of the Kansas-Nebraska state line;

Virgin Water Supply: the Water Supply within the Basin undepleted by the activities of man;

Water Short Year Administration: administration in a year when the projected or actual irrigation water supply is less than 119,000 acre feet of storage available for use from Harlan County Lake as determined by the Bureau of Reclamation using the methodology described in the Harlan County Lake Operation Consensus Plan attached as Appendix K to the Stipulation.

Water Supply of the Basin or Water Supply within the Basin: the stream flows within the Basin, excluding Imported Water Supply;

Well: any structure, device or excavation for the purpose or with the effect of obtaining groundwater for beneficial use from an aquifer, including wells, water wells, or groundwater wells as further defined and used in each State’s laws, rules, and regulations.

III. Basic Formulas

The basic formulas for calculating Virgin Water Supply, Computed Water Supply, Imported Water Supply, Allocations and Computed Beneficial Consumptive Use are set forth below. The results of these calculations shall be shown in a table format as shown in Table 1.

Basic Formulas for Calculating Virgin Water Supply, Computed Water Supply, Allocations and Computed Beneficial Consumptive Use	
Sub-basin VWS	= Gage + All CBCU + ΔS – IWS
Main Stem VWS	= Hardy Gage – Σ Sub-basin gages + All CBCU in the Main Stem + ΔS – IWS
CWS	= VWS - Δ S – FF
Allocation for each State in each Sub-basin And Main Stem	= CWS x %
State's Allocation	= Σ Allocations for Each State
State's CBCU	= Σ State's CBCUs in each Sub-basin and Main Stem

Abbreviations:

- CBCU = Computed Beneficial Consumptive Use
- FF = Flood Flows
- Gage = Gaged Flow
- IWS = Imported Water Supply Credit
- CWS = Computed Water Supply
- VWS = Virgin Water Supply

% = the ratio used to allocate the Computed Water Supply between the States. This ratio is based on the allocations in the Compact

ΔS = Change in Federal Reservoir Storage

A. Calculation of Annual Virgin Water Supply

1. Sub-basin calculation:

The annual Virgin Water Supply for each Sub-basin will be calculated by adding: a) the annual stream flow in that Sub-basin at the Sub-basin stream gage designated in Section II., b) the annual Computed Beneficial Consumptive Use above that gaging station, and c) the Change in Federal Reservoir Storage in that Sub-basin; and from that total subtract any Imported Water Supply Credit. The Computed Beneficial Consumptive Use will be calculated as described in Subsection III. D. Adjustments for flows diverted around stream gages and for Computed Beneficial Consumptive Uses in the Sub-basin between the Sub-basin stream gage and the confluence of the Sub-basin tributary and the Main Stem shall be made as described in Subsections III. D. 1 and 2 and IV. B.

2. Main Stem Calculation:

The annual Virgin Water Supply for the Main Stem will be calculated by adding: a) the flow at the Hardy gage minus the flows from the Sub-basin gages listed in Section II, b) the annual Computed Beneficial Consumptive Use in the Main Stem, and c) the Change in Federal Reservoir Storage from Swanson Lake and Harlan County Lake; and from that total subtract any Imported Water Supply Credit for the Main Stem. Adjustments for flows diverted around Sub-basin stream gages and for Computed Beneficial Consumptive Uses in a Sub-basin between the Sub-basin stream gage and the confluence of the Sub-basin tributary and the Mains Stem shall be made as described in Subsections III. D. 1 and 2 and IV.B.,

3. Imported Water Supply Credit Calculation:

The amount of Imported Water Supply Credit shall be determined by the RRCA Groundwater Model. The Imported Water Supply Credit of a State shall not be included in the Virgin Water Supply and shall be counted as a credit/offset against the Computed Beneficial Consumptive Use of water allocated to that State. Currently, the Imported Water Supply Credits shall be determined using two runs of the RRCA Groundwater Model:

- a. The “base” run shall be the run with all groundwater pumping, groundwater pumping recharge, and surface water recharge within the model study

boundary for the current accounting year turned “on.”

- b. The “no NE import” run shall be the run with the same model inputs as the base run with the exception that surface water recharge associated with Nebraska’s Imported Water Supply shall be turned “off.” This will be the same “no NE import” run used to determine groundwater Computed Beneficial Consumptive Uses.

The Imported Water Supply Credit shall be the difference in stream flows between these two model runs. Differences in stream flows shall be determined at the same locations as identified in Subsection III.D.1. for the “no pumping” runs. Should another State import water into the Basin in the future, the RRCA will develop a similar procedure to determine Imported Water Supply Credits.

B. Calculation of Computed Water Supply

On any Designated Drainage Basin without a Federal Reservoir, the Computed Water Supply will be equal to the Virgin Water Supply of that Designated Drainage Basin minus Flood Flows.

On any Designated Drainage Basin with a Federal Reservoir, the Computed Water Supply will be equal to the Virgin Water Supply minus the Change in Federal Reservoir Storage in that Designated Drainage Basin and minus Flood Flows.

1. Flood Flows

If in any calendar year there are five consecutive months in which the total actual stream flow¹ at the Hardy gage is greater than 325,000 Acre-feet, or any two consecutive months in which the total actual stream flow is greater than 200,000 Acre-feet, the annual flow in excess of 400,000 Acre-feet at the Hardy gage will be considered to be Flood Flows that will be subtracted from the Virgin Water Supply to calculate the Computed Water Supply, and Allocations. The Flood Flow in excess of 400,000 Acre-feet at the Hardy gage will be subtracted from the Virgin Water Supply of the Main Stem to compute the Computed Water Supply unless the Annual Gaged Flows from a Sub-basin were in excess of the flows shown for that Sub-basin in Attachment 1. These excess Sub-basin flows shall be considered to be Sub-basin Flood Flows.

If there are Sub-basin Flood Flows, the total of all Sub-basin Flood Flows shall be compared to the amount of Flood Flows at the Hardy gage. If the sum of the Sub-basin Flood Flows are in excess of the Flood Flow at the Hardy gage, the flows to

¹ These actual stream flows reflect Gaged Flows after depletions by Beneficial Consumptive Use and change in reservoir storage above the gage.

be deducted from each Sub-basin shall be the product of the Flood Flows for each Sub-basin times the ratio of the Flood Flows at the Hardy gage divided by the sum of the Flood Flows of the Sub-basin gages. If the sum of the Sub-basin Flood Flows is less than the Flood Flow at the Hardy gage, the entire amount of each Sub-basin Flood Flow shall be deducted from the Virgin Water Supply to compute the Computed Water Supply of that Sub-basin for that year. The remainder of the Flood Flows will be subtracted from the flows of the Main Stem.

C. Calculation of Annual Allocations

Article IV of the Compact allocates 54,100 Acre-feet for Beneficial Consumptive Use in Colorado, 190,300 Acre-feet for Beneficial Consumptive Use in Kansas and 234,500 Acre-feet for Beneficial Consumptive Use in Nebraska. The Compact provides that the Compact totals are to be derived from the sources and in the amounts specified in Table 2.

The Allocations derived from each Sub-basin to each State shall be the Computed Water Supply multiplied by the percentages set forth in Table 2. In addition, Kansas shall receive 51.1% of the Main Stem Allocation and the Unallocated Supply and Nebraska shall receive 48.9% of the Main Stem Allocation and the Unallocated Supply.

D. Calculation of Annual Computed Beneficial Consumptive Use

1. Groundwater

Computed Beneficial Consumptive Use of groundwater shall be determined by use of the RRCA Groundwater Model. The Computed Beneficial Consumptive Use of groundwater for each State shall be determined as the difference in streamflows using two runs of the model:

The “no NE import” run shall be the run with all groundwater pumping, groundwater pumping recharge, and surface water recharge within the model study boundary for the current accounting year “on”, with the exception that surface water recharge associated with Nebraska’s Imported Water Supply shall be turned “off.”

The “no State pumping” run shall be the run with the same model inputs as the “no NE import” run with the exception that all groundwater pumping and pumping recharge of that State shall be turned “off.”

An output of the model is baseflows at selected stream cells. Changes in the baseflows predicted by the model between the “no NE import” run and the “no-State- pumping” model run is assumed to be the depletions to streamflows.

i.e., groundwater computed beneficial consumptive use, due to State groundwater pumping at that location. The values for each Sub-basin will include all depletions and accretions upstream of the confluence with the Main Stem. The values for the Main Stem will include all depletions and accretions in stream reaches not otherwise accounted for in a Sub-basin. The values for the Main Stem will be computed separately for the reach above Guide Rock, and the reach below Guide Rock.

2. Surface Water

The Computed Beneficial Consumptive Use of surface water for irrigation and non-irrigation uses shall be computed by taking the diversions from the river and subtracting the return flows to the river resulting from those diversions, as described in Subsections IV.A.2.a.-d. The Computed Beneficial Consumptive Use of surface water from Federal Reservoir and Non-Federal Reservoir evaporation shall be the net reservoir evaporation from the reservoirs, as described in Subsections IV.A.2.e.-f.

For Sub-basins where the gage designated in Section II. is near the confluence with the Main Stem, each State's Sub-basin Computed Beneficial Consumptive Use of surface water shall be the State's Computed Beneficial Consumptive Use of surface water above the Sub-basin gage. For Medicine Creek, Sappa Creek, Beaver Creek and Prairie Dog Creek, where the gage is not near the confluence with the Main Stem, each State's Computed Beneficial Consumptive Use of surface water shall be the sum of the State's Computed Beneficial Consumptive Use of surface water above the gage, and its Computed Beneficial Consumptive Use of surface water between the gage and the confluence with the Main Stem.

E. Calculation to Determine Compact Compliance Using Five-Year Running Averages

Each year, using the procedures described herein, the RRCA will calculate the Annual Allocations by Designated Drainage Basin and total for each State, the Computed Beneficial Consumptive Use by Designated Drainage Basin and total for each State and the Imported Water Supply Credit that a State may use for the preceding year. These results for the current Compact accounting year as well as the results of the previous four accounting years and the five-year average of these results will be displayed in the format shown in Table 3.

F. Calculations To Determine Colorado's and Kansas's Compliance with the Sub-basin Non-Impairment Requirement

The data needed to determine Colorado's and Kansas's compliance with the Sub-basin non-impairment requirement in Subsection IV.B.2. of the Stipulation are shown in Tables 4.A. and B.

G. Calculations To Determine Projected Water Supply

1. Procedures to Determine Water Short Years

The Bureau of Reclamation will provide each of the States with a monthly or, if requested by any one of the States, a more frequent update of the projected or actual irrigation supply from Harlan County Lake for that irrigation season using the methodology described in the Harlan County Lake Operation Consensus Plan, attached as Appendix K to the Stipulation. The steps for the calculation are as follows:

Step 1. At the beginning of the calculation month (1) the total projected inflow for the calculation month and each succeeding month through the end of May shall be added to the previous end of month Harlan County Lake content and (2) the total projected 1993 level evaporation loss for the calculation month and each succeeding month through the end of May shall then be subtracted. The total projected inflow shall be the 1993 level average monthly inflow or the running average monthly inflow for the previous five years, whichever is less.

Step 2. Determine the maximum irrigation water available by subtracting the sediment pool storage (currently 164,111 Acre-feet) and adding the summer sediment pool evaporation (20,000 Acre-feet) to the result from Step 1.

Step 3. For October through January calculations, take the result from Step 2 and using the Shared Shortage Adjustment Table in Attachment 2 hereto, determine the preliminary irrigation water available for release. The calculation using the end of December content (January calculation month) indicates the minimum amount of irrigation water available for release at the end of May. For February through June calculations, subtract the maximum irrigation water available for the January calculation month from the maximum irrigation water available for the calculation month. If the result is negative, the irrigation water available for release (January calculation month) stays the same. If the result is positive the preliminary irrigation

water available for release (January calculation month) is increased by the positive amount.

Step 4. Compare the result from Step 3 to 119,000 Acre-feet. If the result from Step 3 is less than 119,000 Acre-feet Water Short Year Administration is in effect.

Step 5. The final annual Water-Short Year Administration calculation determines the total estimated irrigation supply at the end of June (calculated in July). Use the result from Step 3 for the end of May irrigation release estimate, add the June computed inflow to Harlan County Lake and subtract the June computed gross evaporation loss from Harlan County Lake.

2. Procedures to Determine 130,000 Acre Feet Projected Water Supply

To determine the preliminary irrigation supply for the October through June calculation months, follow the procedure described in steps 1 through 4 of the “Procedures to determine Water Short Years” Subsection III. G. 1. The result from step 4 provides the forecasted water supply, which is compared to 130,000 Acre-feet. For the July through September calculation months, use the previous end of calculation month preliminary irrigation supply, add the previous month’s Harlan County Lake computed inflow and subtract the previous month’s computed gross evaporation loss from Harlan County Lake to determine the current preliminary irrigation supply. The result is compared to 130,000 Acre-feet.

H. Calculation of Computed Water Supply, Allocations and Computed Beneficial Consumptive Use Above and Below Guide Rock During Water-Short Administration Years.

For Water-Short-Administration Years, in addition to the normal calculations, the Computed Water Supply, Allocations, Computed Beneficial Consumptive Use and Imported Water Supply Credits shall also be calculated above Guide Rock as shown in Table 5C. These calculations shall be done in the same manner as in non-Water-Short Administration years except that water supplies originating below Guide Rock shall not be included in the calculations of water supplies originating above Guide Rock. The calculations of Computed Beneficial Consumptive Uses shall be also done in the same manner as in non-Water-Short Administration years except that Computed Beneficial Consumptive Uses from diversions below Guide Rock shall not be included. The depletions from the water diverted by the Superior and Courtland Canals at the Superior-Courtland Diversion Dam shall be included in the calculations of Computed Beneficial Consumptive Use above Guide Rock. Imported Water Supply Credits above Guide Rock, as described in Sub-section III.I., may be used as offsets against the Computed Beneficial Consumptive Use above Guide Rock by the State providing the Imported Water Supply Credits.

The Computed Water Supply of the Main Stem reach between Guide Rock and the Hardy gage shall be determined by taking the difference in stream flow at Hardy and Guide Rock, adding Computed Beneficial Consumptive Uses in the reach (this does not include the Computed Beneficial Consumptive Use from the Superior and Courtland Canal diversions), and subtracting return flows from the Superior and Courtland Canals in the reach. The Computed Water Supply above Guide Rock shall be determined by subtracting the Computed Water Supply of the Main Stem reach between Guide Rock and the Hardy gage from the total Computed Water Supply. Nebraska's Allocation above Guide Rock shall be determined by subtracting 48.9% of the Computed Water Supply of the Main Stem reach between Guide Rock and the Hardy gage from Nebraska's total Allocation. Nebraska's Computed Beneficial Consumptive Uses above Guide Rock shall be determined by subtracting Nebraska's Computed Beneficial Consumptive Uses below Guide Rock from Nebraska's total Computed Beneficial Consumptive Use.

I. Calculation of Imported Water Supply Credits During Water-Short Year Administration Years.

Imported Water Supply Credit during Water-Short Year Administration years shall be calculated consistent with Subsection V.B.2.b. of the Stipulation.

The following methodology shall be used to determine the extent to which Imported Water Supply Credit, as calculated by the RRCA Groundwater Model, can be credited to the State importing the water during Water-Short Year Administration years.

1. Monthly Imported Water Supply Credits

The RRCA Groundwater Model will be used to determine monthly Imported Water Supply Credits by State in each Sub-basin and for the Main Stem. The values for each Sub-basin will include all depletions and accretions upstream of the confluence with the Main Stem. The values for the Main Stem will include all depletions and accretions in stream reaches not otherwise accounted for in a Sub-basin. The values for the Main Stem will be computed separately for the reach 1) above Harlan County Dam, 2) between Harlan County Dam and Guide Rock, and 3) between Guide Rock and the Hardy gage. The Imported Water Supply Credit shall be the difference in stream flow for two runs of the model: a) the "base" run and b) the "no State import" run.

During Water-Short Year Administration years, Nebraska's credits in the Sub-basins shall be determined as described in Section III. A. 3.

2. Imported Water Supply Credits Above Harlan County Dam

Nebraska's Imported Water Supply Credits above Harlan County Dam shall be the sum of all the credits in the Sub-basins and the Main Stem above Harlan County Dam.

3. Imported Water Supply Credits Between Harlan County Dam and Guide Rock During the Irrigation Season

- a. During Water-Short Year Administration years, monthly credits in the reach between Harlan County Dam and Guide Rock shall be determined as the differences in the stream flows between the two runs at Guide Rock.
- b. The irrigation season shall be defined as starting on the first day of release of water from Harlan County Lake for irrigation use and ending on the last day of release of water from Harlan County Lake for irrigation use.
- c. Credit as an offset for a State's Computed Beneficial Consumptive Use above Guide Rock will be given to all the Imported Water Supply accruing in the reach between Harlan County Dam and Guide Rock during the irrigation season. If the period of the irrigation season does not coincide with the period of modeled flows, the amount of the Imported Water Supply credited during the irrigation season for that month shall be the total monthly modeled Imported Water Supply Credit times the number of days in the month occurring during the irrigation season divided by the total number of days in the month.

4. Imported Water Supply Credits Between Harlan County Dam and Guide Rock During the Non-Irrigation Season

- a. Imported Water Supply Credit shall be given between Harlan County Dam and Guide Rock during the period that flows are diverted to fill Lovewell Reservoir to the extent that imported water was needed to meet Lovewell Reservoir target elevations.
- b. Fall and spring fill periods shall be established during which credit shall be given for the Imported Water Supply Credit accruing in the reach. The fall period shall extend from the end of the irrigation season to December 1. The spring period shall extend from March 1 to May 31. The Lovewell target elevations for these fill periods are the projected end of November reservoir level and the projected end of May reservoir level for most

probable inflow conditions as indicated in Table 4 in the current Annual Operating Plan prepared by the Bureau of Reclamation.

c. The amount of water needed to fill Lovewell Reservoir for each period shall be calculated as the storage content of the reservoir at its target elevation at the end of the fill period minus the reservoir content at the start of the fill period plus the amount of net evaporation during this period minus White Rock Creek inflows for the same period.

d. If the fill period as defined above does not coincide with the period of modeled flows, the amount of the Imported Water Supply Credit during the fill period for that month shall be the total monthly modeled Imported Water Supply Credit times the number of days in the month occurring during the fill season divided by the total number of days in the month.

e. The amount of non-imported water available to fill Lovewell Reservoir to the target elevation shall be the amount of water available at Guide Rock during the fill period minus the amount of the Imported Water Supply Credit accruing in the reach during the same period.

f. The amount of the Imported Water Supply Credit that shall be credited against a State's Consumptive Use shall be the amount of water imported by that State that is available in the reach during the fill period or the amount of water needed to reach Lovewell Reservoir target elevations minus the amount of non-imported water available during the fill period, whichever is less.

5. Other Credits

Kansas and Nebraska will explore crediting Imported Water Supply that is otherwise useable by Kansas.

J. Calculations of Compact Compliance in Water-Short Year Administration Years

During Water-Short Year Administration, using the procedures described in Subsections III.A-D, the RRCA will calculate the Annual Allocations for each State, the Computed Beneficial Consumptive Use by each State, and Imported Water Supply Credit that a State may use to offset Computed Beneficial Consumptive Use in that year. The resulting annual and average values will be calculated as displayed in Tables 5 A-C and E.

If Nebraska is implementing an Alternative Water-Short-Year Administration Plan, data to determine Compact compliance will be shown in Table 5D. Nebraska's compliance with the Compact will be determined in the same manner as Nebraska's Above Guide Rock

compliance except that compliance will be based on a three-year running average of the current year and previous two year calculations. In addition, Table 5 D. will display the sum of the previous two-year difference in Allocations above Guide Rock and Computed Beneficial Consumptive Uses above Guide Rock minus any Imported Water Credits and compare the result with the Alternative Water-Short-Year Administration Plan's expected decrease in Computed Beneficial Consumptive Use above Guide Rock. Nebraska will be within compliance with the Compact as long as the three-year running average difference in Column 8 is positive and the sum of the previous year and current year deficits above Guide Rock are not greater than the expected decrease in Computed Beneficial Consumptive Use under the plan.

IV. Specific Formulas

A. Computed Beneficial Consumptive Use

1. Computed Beneficial Consumptive Use of Groundwater:

The Computed Beneficial Consumptive Use caused by groundwater diversion shall be determined by the RRCA Groundwater Model as described in Subsection III.D.1.

2. Computed Beneficial Consumptive Use of Surface Water:

The Computed Beneficial Consumptive Use of surface water shall be calculated as follows:

a) Non-Federal Canals

Computed Beneficial Consumptive Use from diversions by non- federal canals shall be 60 percent of the diversion; the return flow shall be 40 percent of the diversion

b) Individual Surface Water Pumps

Computed Beneficial Consumptive Use from small individual surface water pumps shall be 75 percent of the diversion; return flows will be 25 percent of the diversion unless a state provides data on the amount of different system types in a Sub-basin, in which case the following percentages will be used for each system type:

Gravity Flow. 30%

Center Pivot	17%
LEPA	10%

c) Federal Canals

Computed Beneficial Consumptive Use of diversions by Federal canals will be calculated as shown in Attachment 7. For each Bureau of Reclamation Canal the field deliveries shall be subtracted from the diversion from the river to determine the canal losses. The field delivery shall be multiplied by one minus an average system efficiency for the district to determine the loss of water from the field. Eighty-two percent of the sum of the field loss plus the canal loss shall be considered to be the return flow from the canal diversion for diversions occurring during the irrigation season (May-September). For recharge diversions occurring during the non-irrigation season (October-April), 92 percent of the sum of the field loss plus the canal loss shall be considered to be the return flow from the canal diversion. The assumed field efficiencies and the amount of the field and canal loss that reaches the stream may be reviewed by the RRCA and adjusted as appropriate to insure their accuracy.

d) Non-irrigation Uses

Any non-irrigation uses diverting or pumping more than 50 acre-feet per year will be required to measure diversions. Non-irrigation uses diverting more than 50 Acre-feet per year will be assessed a Computed Beneficial Consumptive Use of 50% of what is pumped or diverted, unless the entity presents evidence to the RRCA demonstrating a different percentage should be used.

e) Evaporation from Federal Reservoirs

Net Evaporation from Federal Reservoirs will be calculated as follows:

(1) Harlan County Lake, Evaporation Calculation

April 1 through October 31:

Evaporation from Harlan County Lake is calculated by the Corps of Engineers on a daily basis from April 1 through October 31. Daily readings are taken from a Class A evaporation pan maintained near the project office. Any precipitation recorded at the project office is added to the pan reading to obtain the actual evaporation amount.

The pan value is multiplied by a pan coefficient that varies by month. These values are:

March	.56
April	.52
May	.53
June	.60
July	.68
August	.78
September	.91
October	1.01

The pan coefficients were determined by studies the Corps of Engineers conducted a number of years ago. The result is the evaporation in inches. It is divided by 12 and multiplied by the daily lake surface area in acres to obtain the evaporation in Acre-feet. The lake surface area is determined by the 8:00 a.m. elevation reading applied to the lake's area-capacity data. The area-capacity data is updated periodically through a sediment survey. The last survey was completed in December 2000.

November 1 through March 31

During the winter season, a monthly total evaporation in inches has been determined. The amount varies with the percent of ice cover. The values used are:

HARLAN COUNTY LAKE

Estimated Evaporation in Inches
Winter Season -- Monthly Total

PERCENTAGE OF ICE COVER

	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
JAN	0.88	0.87	0.85	0.84	0.83	0.82	0.81	0.80	0.78	0.77	0.76
FEB	0.90	0.88	0.87	0.86	0.85	0.84	0.83	0.82	0.81	0.80	0.79
MAR	1.29	1.28	1.27	1.26	1.25	1.24	1.23	1.22	1.21	1.20	1.19
OCT	4.87			NO ICE							
NOV	2.81			NO ICE							
DEC	1.31	1.29	1.27	1.25	1.24	1.22	1.20	1.18	1.17	1.16	1.14

The monthly total is divided by the number of days in the month

to obtain a daily evaporation value in inches. It is divided by 12 and multiplied by the daily lake surface area in acres to obtain the evaporation in Acre-feet. The lake surface area is determined by the 8:00 a.m. elevation reading applied to the lake's area-capacity data. The area-capacity data is updated periodically through a sediment survey. The last survey was completed in December 2000.

To obtain the net evaporation, the monthly precipitation on the lake is subtracted from the monthly gross evaporation. The monthly precipitation is calculated by multiplying the sum of the month's daily precipitation in inches by the average of the end of the month lake surface area for the previous month and the end of the month lake surface area for the current month in acres and dividing the result by 12 to obtain the precipitation for the month in acre feet.

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. 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.

(2) Evaporation Computations for Bureau of Reclamation Reservoirs

The Bureau of Reclamation computes the amount of evaporation loss on a monthly basis at Reclamation reservoirs. The following procedure is utilized in calculating the loss in Acre-feet.

An evaporation pan reading is taken each day at the dam site. This measurement is the amount of water lost from the pan over a 24-hour period in inches. The evaporation pan reading is adjusted for any precipitation recorded during the 24-hour period. Instructions for determining the daily pan evaporation are found in the "National Weather Service Observing Handbook No. 2 – Substation Observations." All dams located in the Kansas River Basin with the exception of Bonny Dam are National Weather Service Cooperative

Observers. The daily evaporation pan readings are totaled at the end of each month and converted to a “free water surface” (FWS) evaporation, also referred to as “lake” evaporation. The FWS evaporation is determined by multiplying the observed pan evaporation by a coefficient of .70 at each of the reservoirs. This coefficient can be affected by several factors including water and air temperatures. The National Oceanic and Atmospheric Administration (NOAA) has published technical reports describing the determination of pan coefficients. The coefficient used is taken from the “NOAA Technical Report NWS 33, Map of coefficients to convert class A pan evaporation to free water surface evaporation”. This coefficient is used for the months of April through October when evaporation pan readings are recorded at the dams. The monthly FWS evaporation is then multiplied by the average surface area of the reservoir during the month in acres. Dividing this value by twelve will result in the amount of water lost to evaporation in Acre-feet during the month.

During the winter months when the evaporation pan readings are not taken, monthly evaporation tables based on the percent of ice cover are used. The tables used were developed by the Corps of Engineers and were based on historical average evaporation rates. A separate table was developed for each of the reservoirs. The monthly evaporation rates are multiplied by the .70 coefficient for pan to free water surface adjustment, divided by twelve to convert inches to feet and multiplied by the average reservoir surface area during the month in acres to obtain the total monthly evaporation loss in Acre-feet.

To obtain the net evaporation, the monthly precipitation on the lake is subtracted from the monthly gross evaporation. The monthly precipitation is calculated by multiplying the sum of the month's daily precipitation in inches by the average of the end of the month lake surface area for the previous month and the end of the month lake surface area for the current month in acres and dividing the result by 12 to obtain the precipitation for the month in acre feet.

f) Non-Federal Reservoir Evaporation:

For Non-Federal Reservoirs with a storage capacity less than 200 Acre-feet, the presumptive average annual surface area is 25% of the area at the principal spillway elevation. Net evaporation for each such Non-Federal Reservoir will be calculated by multiplying the presumptive average annual surface area by the net evaporation from the nearest climate and evaporation

station to the Non-Federal Reservoir. A State may provide actual data in lieu of the presumptive criteria.

Net evaporation from Non-Federal Reservoirs with 200 Acre-feet of storage or greater will be calculated by multiplying the average annual surface area (obtained from the area-capacity survey) and the net evaporation from the nearest evaporation and climate station to the reservoir. If the average annual surface area is not available, the Non-Federal Reservoirs with 200 Acre-feet of storage or greater will be presumed to be full at the principal spillway elevation.

B. Specific Formulas for Each Sub-basin and the Main Stem

All calculations shall be based on the calendar year and shall be rounded to the nearest 10 Acre-feet using the conventional rounding formula of rounding up for all numbers equal to five or higher and otherwise rounding down.

Abbreviations:

CBCU	= Computed Beneficial Consumptive Use
CWS	= Computed Water Supply
D	= Non-Federal Canal Diversions for Irrigation
Ev	= Evaporation from Federal Reservoirs
EvNFR	= Evaporation from Non-Federal Reservoirs
FF	= Flood Flow
GW	= Groundwater Computed Beneficial Consumptive Use (includes irrigation and non-irrigation uses)
IWS	= Imported Water Supply Credit from Nebraska
M&I	= Non-Irrigation Surface Water Diversions (Municipal and Industrial)
P	= Small Individual Surface Water Pump Diversions for Irrigation
RF	= Return Flow
VWS	= Virgin Water Supply
c	= Colorado
k	= Kansas
n	= Nebraska
ΔS	= Change in Federal Reservoir Storage
%	= Average system efficiency for individual pumps in the Sub-basin
% BRF	= Percent of Diversion from Bureau Canals that returns to the stream
###	= Value expected to be zero

3. North Fork of Republican River in Colorado ²

$$\text{CBCU Colorado} = 0.6 \times \text{Haigler Canal Diversion Colorado} + 0.6 \times D_c + \% \times P_c + 0.5 \times M\&I_c + E_vNFR_c + G_Wc$$

$$\text{CBCU Kansas} = G_Wk$$

$$\text{CBCU Nebraska} = 0.6 \times \text{Haigler Canal Diversion Nebraska} + G_Wn$$

Note: The diversion for Haigler Canal is split between Colorado and Nebraska based on the percentage of land irrigated in each state

$$\text{VWS} = \text{North Fork of the Republican River at the State Line, Stn. No. 06823000} + \text{CBCUc} + \text{CBCUk} + \text{CBCUn} + \text{Nebraska Haigler Canal RF} - \text{IWS}$$

Note: The Nebraska Haigler Canal RF returns to the Main Stem

$$\text{CWS} = \text{VWS} - \text{FF}$$

$$\text{Allocation Colorado} = 0.224 \times \text{CWS}$$

$$\text{Allocation Nebraska} = 0.246 \times \text{CWS}$$

$$\text{Unallocated} = 0.53 \times \text{CWS}$$

4. Arikaree River ²

$$\text{CBCU Colorado} = 0.6 \times D_c + \% \times P_c + 0.5 \times M\&I_c + E_vNFR_c + G_Wc$$

$$\text{CBCU Kansas} = 0.6 \times D_k + \% \times P_k + 0.5 \times M\&I_k + E_vNFR_k + G_Wk$$

$$\text{CBCU Nebraska} = 0.6 \times D_n + \% \times P_n + 0.5 \times M\&I_n + E_vNFR_n + G_Wn$$

$$\text{VWS} = \text{Arikaree Gage at Haigler Stn. No. 06821500} + \text{CBCUc} + \text{CBCUk} + \text{CBCUn} - \text{IWS}$$

² The RRCA will investigate whether return flows from the Haigler Canal diversion in Colorado may return to the Arikaree River, not the North Fork of the Republican River, as indicated in the formulas. If there are return flows from the Haigler Canal to the Arikaree River, these formulas will be changed to recognize those returns.

$$\text{CWS} = \text{VWS} - \text{FF}$$

$$\text{Allocation Colorado} = 0.785 \times \text{CWS}$$

$$\text{Allocation Kansas} = 0.051 \times \text{CWS}$$

$$\text{Allocation Nebraska} = 0.168 \times \text{CWS}$$

$$\text{Unallocated} = -0.004 \times \text{CWS}$$

5. Buffalo Creek

$$\text{CBCU Colorado} = 0.6 \times \text{Dc} + \% \times \text{Pc} + 0.5 \times \text{M\&In} + \text{EvNFRc} + \text{GWc}$$

$$\text{CBCU Kansas} = \text{GWk}$$

$$\text{CBCU Nebraska} = 0.6 \times \text{Dn} + \% \times \text{Pn} + 0.5 \times \text{M\&In} + \text{EvNFRn} + \text{GWn}$$

$$\text{VWS} = \text{Buffalo Creek near Haigler Gage Stn. No. 06823500} + \text{CBCUc} + \text{CBCUk} + \text{CBCUn} - \text{IWS}$$

$$\text{CWS} = \text{VWS} - \text{FF}$$

$$\text{Allocation Nebraska} = 0.330 \times \text{CWS}$$

$$\text{Unallocated} = 0.670 \times \text{CWS}$$

6. Rock Creek

$$\text{CBCU Colorado} = \text{GWc}$$

$$\text{CBCU Kansas} = \text{GWk}$$

$$\text{CBCU Nebraska} = 0.6 \times \text{Dn} + \% \times \text{Pn} + 0.5 \times \text{M\&In} + \text{EvNFRn} + \text{GWn}$$

$$\text{VWS} = \text{Rock Creek at Parks Gage Stn. No. 06824000} + \text{CBCUc} + \text{CBCUk} + \text{CBCUn} - \text{IWS}$$

$$\text{CWS} = \text{VWS} - \text{FF}$$

$$\text{Allocation Nebraska} = 0.400 \times \text{CWS}$$

Unallocated = 0.600 x CWS

7. South Fork Republican River

CBCU Colorado = 0.6 x Hale Ditch Diversion + 0.6 x Dc + % x Pc + 0.5 x M&Ic + EvNFRc + Bonny Reservoir Ev + GWc

CBCU Kansas = 0.6 x Dk + % x Pk + 0.5 x M&Ik + EvNFRk + GWk

CBCU Nebraska = 0.6 x Dn + % x Pn + 0.5 x M&In + EvNFRn + GWn

VWS = South Fork Republican River near Benkelman Gage Stn. No. 06827500 + CBCUc + CBCUk + CBCUn + ΔS Bonny Reservoir – IWS

CWS = VWS - ΔS Bonny Reservoir - FF

Allocation Colorado = 0.444 x CWS

Allocation Kansas = 0.402 x CWS

Allocation Nebraska = 0.014 x CWS

Unallocated = 0.140 x CWS

8. Frenchman Creek in Nebraska

CBCU Colorado = GWc

CBCU Kansas = GWk

CBCU Nebraska = Culbertson Canal Diversions (IRR Season) x (1-%BRF) + Culbertson Canal Diversions (Non-IRR Season) x (1-92%) + Culbertson Extension (IRR Season) x (1-%BRF) + Culbertson Extension (Non-IRR Season) x (1-92%) + 0.6 x Champion Canal Diversion + 0.6 x Riverside Canal Diversion + 0.6 x Dn + % x Pn + 0.5 x M&In + EvNFRn + Enders Reservoir Ev + GWn

VWS = Frenchman Creek in Culbertson, Nebraska Gage Stn. No. 06835500 + CBCUc + CBCUk + CBCUn + 0.17 x

Culbertson Diversion RF + Culbertson Extension RF + 0.78
x Riverside Diversion RF + ΔS Enders Reservoir – IWS

Note: 17% of the Culbertson Diversion RF and 100% of the
Culbertson Extension RF return to the Main Stem

CWS = VWS - ΔS Enders Reservoir – FF

Allocation Nebraska = 0.536 x CWS

Unallocated = 0.464 x CWS

9. Driftwood Creek

CBCU Colorado = GWc

CBCU Kansas = 0.6 x Dk + % x Pk + 0.5 x M&Ik + EvNFRk + GWk

CBCU Nebraska = 0.6 x Dn + % x Pn + 0.5 x M&In + EvNFRn + GWn

VWS = Driftwood Creek near McCook Gage Stn. No. 06836500 +
CBCUc + CBCUk + CBCUn – 0.24 x Meeker Driftwood
Canal RF - IWS

Note: 24 % of the Meeker Driftwood Canal RF returns to
Driftwood Creek

CWS = VWS – FF

Allocation Kansas = 0.069 x CWS

Allocation Nebraska = 0.164 x CWS

Unallocated = 0.767 x CWS

10. Red Willow Creek in Nebraska

CBCU Colorado = GWc

CBCU Kansas = GWk

CBCU Nebraska = 0.1 x Red Willow Canal CBCU + 0.6 x Dn + % x Pn + 0.5
x M&In + EvNFRn + 0.1 x Hugh Butler Lake Ev + GWn

Note:

Red Willow Canal CBCU = Red Willow Canal Diversion
(IRR Season) x (1- % BRF) + Red Willow Canal Diversion
(Non-IRR Season) x (1-92%)

90% of the Red Willow Canal CBCU and 90% of Hugh
Butler Lake Ev charged to Nebraska's CBCU in the Main
Stem

VWS = Red Willow Creek near Red Willow Gage Stn. No.
06838000 + CBCUc + CBCUk + CBCUn + 0.9 x Red
Willow Canal CBCU + 0.9 x Hugh Butler Lake Ev + 0.9
x Red Willow Canal RF + ΔS Hugh Butler Lake – IWS

Note: 90% of the Red Willow Canal RF returns to the Main
Stem

CWS = VWS - ΔS Hugh Butler Lake - FF

Allocation Nebraska = 0.192 x CWS

Unallocated = 0.808 x CWS

11. Medicine Creek

CBCU Colorado = GWc

CBCU Kansas = GWk

CBCU Nebraska = 0.6 x Dn above and below gage + % x Pn above and below
gage + 0.5 x M&In above and below gage + EvNFRn above
and below gage + GWn

Note: Harry Strunk Lake Ev charged to Nebraska's CBCU
in the Main Stem.

CU from Harry Strunk releases in the Cambridge Canal is
charged to the Main stem (no adjustment to the VWS
formula is needed as this water shows up in the Medicine
Creek gage).

VWS = Medicine Creek below Harry Strunk Lake Gage Stn. No.

$$06842500 + \text{CBCUc} + \text{CBCUk} + \text{CBCUn} - 0.6 \times \text{Dn below gage} - \% \times \text{Pn below gage} - 0.5 * \text{M\&In below gage} - \text{EvNFRn below gage} + \text{Harry Strunk Lake Ev} + \Delta\text{S Harry Strunk Lake} - \text{IWS}$$

Note: The CBCU surface water terms for Nebraska which occur below the gage are added in the VWS for the Main Stem

$$\text{CWS} = \text{VWS} - \Delta\text{S Harry Strunk Lake} - \text{FF}$$

$$\text{Allocation Nebraska} = 0.091 \times \text{CWS}$$

$$\text{Unallocated} = 0.909 \times \text{CWS}$$

12. Beaver Creek

$$\text{CBCU Colorado} = 0.6 \times \text{Dc} + \% \times \text{Pc} + 0.5 \times \text{M\&Ic} + \text{EvNFRc} + \text{GWc}$$

$$\text{CBCU Kansas} = 0.6 \times \text{Dk} + \% \times \text{Pk} + 0.5 \times \text{M\&Ik} + \text{EvNFRk} + \text{GWk}$$

$$\text{CBCU Nebraska} = 0.6 \times \text{Dn above and below gage} + \% \times \text{Pn above and below gage} + 0.5 \times \text{M\&In above and below gage} + \text{EvNFRn above and below gage} + \text{GWn}$$

$$\text{VWS} = \text{Beaver Creek near Beaver City gage Stn. No. 06847000} + \text{BCUc} + \text{CBCUk} + \text{CBCUn} - 0.6 \times \text{Dn below gage} - \% \times \text{Pn below gage} - 0.5 * \text{M\&In below gage} - \text{EvNFRn below gage} - \text{IWS}$$

Note: The CBCU surface water terms for Nebraska which occur below the gage are added in the VWS for the Main Stem

$$\text{CWS} = \text{VWS} - \text{FF}$$

$$\text{Allocation Colorado} = 0.200 \times \text{CWS}$$

$$\text{Allocation Kansas} = 0.388 \times \text{CWS}$$

$$\text{Allocation Nebraska} = 0.406 \times \text{CWS}$$

Unallocated = 0.006 x CWS

13. Sappa Creek

CBCU Colorado = GWc

CBCU Kansas = 0.6 x Dk + % x Pk + 0.5 x M&Ik + EvNFRk + GWk

CBCU Nebraska = 0.6 x Dn above and below gage + % x Pn above and below gage + 0.5 x M&In above and below gage + EvNFRn above and below gage + GWn

VWS = Sappa Creek near Stamford gage Stn. No. 06847500 – Beaver Creek near Beaver City gage Stn. No. 06847000 + CBCUc + CBCUk + CBCUn – 0.6 x Dn below gage - % x Pn below gage – 0.5 * M&In below gage - EvNFRn below gage – IWS

Note: The CBCU surface water terms for Nebraska which occur below the gage are added in the VWS for the Main Stem

CWS = VWS - FF

Allocation Kansas = 0.411 x CWS

Allocation Nebraska = 0.411 x CWS

Unallocated = 0.178 x CWS

14. Prairie Dog Creek

CBCU Colorado = GWc

CBCU Kansas = Almena Canal Diversion x (1-%BRF) + 0.6 x Dk + % x Pk + 0.5 x M&Ik + EvNFRk + Keith Sebelius Lake Ev + GWk

CBCU Nebraska = 0.6 x Dn below gage + % x Pn below gage + 0.5 x M&In below gage + EvNFRn + GWn below gage

VWS = Prairie Dog Creek near Woodruff, Kansas USGS Stn. No.

$06848500 + \text{CBCUc} + \text{CBCUk} + \text{CBCUn} - 0.6 \times \text{Dn below gage} - \% \times \text{Pn below gage} - 0.5 \times \text{M\&In below gage} - \text{EvNFRn below gage} + \Delta\text{S Keith Sebelius Lake} - \text{IWS}$

Note: The CBCU surface water terms for Nebraska which occur below the gage are added in the VWS for the Main Stem

CWS = VWS - $\Delta\text{S Keith Sebelius Lake}$ - FF

Allocation Kansas = $0.457 \times \text{CSW}$

Allocation Nebraska = $0.076 \times \text{CWS}$

Unallocated = $0.467 \times \text{CWS}$

15. The North Fork of the Republican River in Nebraska and the Main Stem of the Republican River between the junction of the North Fork and the Arikaree River and the Republican River near Hardy

CBCU Colorado = GWc

CBCU Kansas =
 (Deliveries from the Courtland Canal to Kansas above Lovewell) $\times (1 - \% \text{BRF})$
 + Amount of transportation loss of Courtland Canal deliveries to Lovewell that does not return to the river, charged to Kansas
 + (Diversions of Republican River water from Lovewell Reservoir by the Courtland Canal below Lovewell) $\times (1 - \% \text{BRF})$
 + $0.6 \times \text{Dk}$
 + $\% \times \text{Pk}$
 + $0.5 \times \text{M\&Ik}$
 + EvNFRk
 + Harlan County Lake Ev charged to Kansas
 + Lovewell Reservoir Ev charged to the Republican River
 + GWk

CBCU Nebraska =
 Deliveries from Courtland Canal to Nebraska lands $\times (1 - \% \text{BRF})$
 + Superior Canal (IRR Season) $\times (1 - \% \text{BRF})$ + Superior Canal

(Non-IRR Season) x (1 - 92%)
 + Franklin Pump Canal (IRR Season) x (1- %BRF) + Franklin Pump Canal (Non-IRR Season) x (1 - 92 %)
 + Franklin Canal (IRR Season) x (1- %BRF) + Franklin Canal (Non-IRR Season) x (1 - 92%)
 + Naponee Canal (IRR Season) x (1- %BRF) + Naponee Canal (Non-IRR Season) x (1 - 92%)
 + Cambridge Canal (IRR Season) x (1- %BRF) + Cambridge Canal (Non-IRR Season) x (1 - 92%)
 + Bartley Canal (IRR Season) x (1- %BRF) + Bartley Canal (Non-IRR Season) x (1 - 92%)
 + Meeker-Driftwood Canal (IRR Season) x (1- %BRF) + Meeker-Driftwood Canal (Non-IRR Season) x (1- 92%)
 + 0.9 x Red Willow Canal CBCU
 + 0.6 x Dn
 + % x Pn
 + 0.5 x M&In
 + EvNFRn
 + 0.9 x Hugh Butler Lake Ev
 + Harry Strunk Lake Ev
 + Swanson Lake Ev
 + Harlan County Lake Ev charged to Nebraska
 + GWn

Notes:

The allocation of transportation losses in the Courtland Canal above Lovewell between Kansas and Nebraska shall be done by the Bureau of Reclamation and reported in their “Courtland Canal Above Lovewell” spreadsheet. Deliveries and losses associated with deliveries to both Nebraska and Kansas above Lovewell shall be reflected in the Bureau’s Monthly Water District reports. Losses associated with delivering water to Lovewell shall be separately computed.

Amount of transportation loss of the Courtland Canal deliveries to Lovewell that does not return to the river, charged to Kansas shall be 18% of the Bureau’s estimate of losses associated with these deliveries.

Red Willow Canal CBCU = Red Willow Canal Diversion x (IRR Season) x (1- % BRF) + Red Willow Canal Diversion (Non-IRR Season) x (1 - 92%)

10% of the Red Willow Canal CBCU is charged to Nebraska’s CBCU in Red Willow Creek sub-basin

10% of Hugh Butler Lake Ev is charged to Nebraska's CBCU in the Red Willow Creek sub-basin

None of the Harry Strunk Lake EV is charged to Nebraska's CBCU in the Medicine Creek sub-basin

VWS

=

Republican River near Hardy Gage Stn. No. 06853500

- North Fork of the Republican River at the State Line, Stn.

No. 06823000

- Arikaree Gage at Haigler Stn. No. 06821500

- Buffalo Creek near Haigler Gage Stn. No. 06823500

- Rock Creek at Parks Gage Stn. No. 06824000

-South Fork Republican River near Benkelman Gage Stn. No. 06827500

- Frenchman Creek in Culbertson Stn. No. 06835500

- Driftwood Creek near McCook Gage Stn. No. 06836500

- Red Willow Creek near Red Willow Gage Stn. No. 06838000

- Medicine Creek below Harry Strunk Lake Gage Stn. No. 06842500

- Sappa Creek near Stamford Gage Stn. No. 06847500

- Prairie Dog Creek near Woodruff, Kansas Stn. No. 68-485000

+ CBCUc

+ CBCUn

+ 0.6 x Dk

+ % x Pk

+ 0.5 x M&Ik

+ EvNFRk

+ Harlan County Lake Ev charged to Kansas

+Amount of transportation loss of the Courtland Canal above the Stateline that does not return to the river, charged to Kansas

+GWk

- 0.9 x Red Willow Canal CBCU

- 0.9 x Hugh Butler Ev

- Harry Strunk Ev

+ 0.6 x Dn below Medicine Creek gage

+ % x Pn below Medicine Creek gage
+ 0.5 * M&In below Medicine Creek gage
+ EvNFRn below Medicine Creek gage
+ 0.6 x Dn below Beaver Creek gage
+ % x Pn below Beaver Creek gage
+ 0.5 * M&In below Beaver Creek gage
+ EvNFRn below Beaver Creek gage

+ 0.6 x Dn below Sappa Creek gage
+ % x Pn below Sappa Creek gage
+ 0.5 * M&In below Sappa Creek gage
+ EvNFRn below Sappa Creek gage

+ 0.6 x Dn below Prairie Dog Creek gage
+ % x Pn below Prairie Dog Creek gage
+ 0.5 * M&In below Prairie Dog Creek gage
+ EvNFRn below Prairie Dog Creek gage

+ Change in Storage Harlan County Lake
+ Change in Storage Swanson Lake

- Nebraska Haigler Canal RF
- 0.78 x Riverside Canal RF
- 0.17 x Culbertson Canal RF
- Culbertson Canal Extension RF to Main Stem
+ 0.24 x Meeker Driftwood Canal RF which returns to
Driftwood Creek
- 0.9 x Red Willow Canal RF

+ Courtland Canal at Kansas-Nebraska State Line Gage Stn
No. 06852500

- Courtland Canal RF in Kansas above Lovewell Reservoir

-IWS

Notes:

None of the Nebraska Haigler Canal RF returns to the North
Fork of the Republican River

83% of the Culbertson Diversion RF and none of the
Culbertson Extension RF return to Frenchman Creek

24 % of the Meeker Driftwood Canal RF returns to
Driftwood Creek.

10% of the Red Willow Canal RF returns to Red Willow Creek

Courtland Canal RF in Kansas above Lovewell Reservoir =
 $0.015 \times$ (Courtland Canal at Kansas-Nebraska State Line
Gage Stn No. 06852500)

CWS = VWS - Change in Storage Harlan County Lake - Change in
Storage Swanson Lake - FF

Allocation Kansas = $0.511 \times$ CWS

Allocation Nebraska = $0.489 \times$ CWS

V. Annual Data/ Information Requirements, Reporting, and Verification

The following information for the previous calendar year shall be provided to the members of the RRCA Engineering Committee by April 15th of each year, unless otherwise specified.

All information shall be provided in electronic format, if available.

Each State agrees to provide all information from their respective State that is needed for the RRCA Groundwater Model and RRCA Accounting Procedures and Reporting Requirements, including but not limited to the following:

A. Annual Reporting

1. Surface water diversions and irrigated acreage:

Each State will tabulate the canal, ditch, and other surface water diversions that are required by RRCA annual compact accounting and the RRCA Groundwater Model on a monthly format (or a procedure to distribute annual data to a monthly basis) and will forward the surface water diversions to the other States. This will include available diversion, wasteway, and farm delivery data for canals diverting from the Platte River that contribute to Imported Water Supply into the Basin. Each State will provide the water right number, type of use, system type, location, diversion amount, and acres irrigated.

2. Groundwater pumping and irrigated acreage:

Each State will tabulate and provide all groundwater well pumping estimates that are required for the RRCA Groundwater Model to the other States.

Colorado – will provide an estimate of pumping based on a county format that is based upon system type, Crop Irrigation Requirement (CIR), irrigated acreage, crop distribution, and irrigation efficiencies. Colorado will require installation of a totalizing flow meter, installation of an hours meter with a measurement of the pumping rate, or determination of a power conversion coefficient for 10% of the active wells in the Basin by December 31, 2005. Colorado will also provide an annual tabulation for each groundwater well that measures groundwater pumping by a totalizing flow meter, hours meter or power conversion coefficient that includes: the groundwater well permit number, location, reported hours, use, and irrigated acreage.

Kansas - will provide an annual tabulation by each groundwater well that includes: water right number, groundwater pumping determined by a meter on each well (or group of wells in a manifold system) or by reported hours of use and rate; location; system type (gravity, sprinkler, LEPA, drip, etc.); and irrigated acreage. Crop distribution will be provided on a county basis.

Nebraska – will provide an annual tabulation through the representative Natural Resource District (NRD) in Nebraska that includes: the well registration number or other ID number; groundwater pumping determined by a meter on each well (or group of wells in a manifold system) or by reported hours of use and rate; wells will be identified by; location; system type (gravity, sprinkler, LEPA, drip, etc.); and irrigated acreage. Crop distribution will be provided on a county basis.

3. Climate information:

Each State will tabulate and provide precipitation, temperature, relative humidity or dew point, and solar radiation for the following climate stations:

State	Identification	Name
Colorado		
Colorado	C050109	Akron 4 E
Colorado	C051121	Burlington
Colorado	C054413	Julesburg
Colorado	C059243	Wray
Kansas	C140439	Atwood 2 SW
Kansas	C141699	Colby 1SW
Kansas	C143153	Goodland
Kansas	C143837	Hoxie

Kansas	C145856	Norton 9 SSE
Kansas	C145906	Oberlin1 E
Kansas	C147093	Saint Francis
Kansas	C148495	Wakeeny
Nebraska	C250640	Beaver City
Nebraska	C250810	Bertrand
Nebraska	C252065	Culbertson
Nebraska	C252690	Elwood 8 S
Nebraska	C253365	Gothenburg
Nebraska	C253735	Hebron
Nebraska	C253910	Holdredge
Nebraska	C254110	Imperial
Nebraska	C255090	Madrid
Nebraska	C255310	McCook
Nebraska	C255565	Minden
Nebraska	C256480	Palisade
Nebraska	C256585	Paxton
Nebraska	C257070	Red Cloud
Nebraska	C258255	Stratton
Nebraska	C258320	Superior
Nebraska	C258735	Upland
Nebraska	C259020	Wauneta 3 NW

4. Crop Irrigation Requirements:

Each State will tabulate and provide estimates of crop irrigation requirement information on a county format. Each State will provide the percentage of the crop irrigation requirement met by pumping; the percentage of groundwater irrigated lands served by sprinkler or flood irrigation systems, the crop irrigation requirement; crop distribution; crop coefficients; gain in soil moisture from winter and spring precipitation, net crop irrigation requirement; and/or other information necessary to compute a soil/water balance.

5. Streamflow Records from State-Maintained Gaging Records:

Streamflow gaging records from the following State maintained gages will be provided:

Station No	Name
00126700	Republican River near Trenton
06831500	Frenchman Creek near Imperial
06832500	Frenchman Creek near Enders

06835000	Stinking Water Creek near Palisade
06837300	Red Willow Creek above Hugh Butler Lake
06837500	Red Willow Creek near McCook
06841000	Medicine Creek above Harry Strunk Lake
06842500	Medicine Creek below Harry Strunk Lake
06844000	Muddy Creek at Arapahoe
06844210	Turkey Creek at Edison
06847000	Beaver Creek near Beaver City
	Republican River at Riverton
06851500	Thompson Creek at Riverton
06852000	Elm Creek at Amboy
	Republican River at the Superior-Courtland Diversion Dam

6. Platte River Reservoirs:

The State of Nebraska will provide the end-of-month contents, inflow data, outflow data, area-capacity data, and monthly net evaporation, if available, from Johnson Lake; Elwood Reservoir; Sutherland Reservoir; Maloney Reservoir; and Jeffrey Lake.

7. Water Administration Notification:

The State of Nebraska will provide the following information that describes the protection of reservoir releases from Harlan County Lake and for the administration of water rights junior in priority to February 26, 1948:

Date of notification to Nebraska water right owners to curtail their diversions, the amount of curtailment, and length of time for curtailment.

The number of notices sent.

The number of diversions curtailed and amount of curtailment in the Harlan County Lake to Guide Rock reach of the Republican River.

8. Moratorium:

Each State will provide a description of all new Wells constructed in the Basin Upstream of Guide Rock including the owner, location (legal description), depth and diameter or dimension of the constructed water well, casing and screen information, static water level, yield of the water well in gallons per minute or gallons per hour, and intended use of the water well.

Designation whether the Well is a:

- a. Test hole;
- b. Dewatering Well with an intended use of one year or less;
- c. Well designed and constructed to pump fifty gallons per minute or less;
- d. Replacement Water Well, including a description of the Well that is replaced providing the information described above for new Wells and a description of the historic use of the Well that is replaced;
- e. Well necessary to alleviate an emergency situation involving provision of water for human consumption, including a brief description of the nature of the emergency situation and the amount of water intended to be pumped by and the length of time of operation of the new Well;
- f. Transfer Well, including a description of the Well that is transferred providing the information described above for new Wells and a description of the Historic Consumptive Use of the Well that is transferred;
- g. Well for municipal and/or industrial expansion of use;

Wells in the Basin in Northwest Kansas or Colorado. Kansas and Colorado will provide the information described above for new Wells along with copies of any other information that is required to be filed with either State or local agencies under the laws, statutes, rules and regulations in existence as of April 30, 2002, and;

Any changes in State law in the previous year relating to existing Moratorium.

9. Non-Federal Reservoirs:

Each State will conduct an inventory of Non Federal Reservoirs by December 31, 2004, for inclusion in the annual Compact Accounting. The inventory shall include the following information: the location, capacity (in Acre-feet) and area (in acres) at the principal spillway elevation of each Non-Federal Reservoir. The States will annually provide any updates to the initial inventory of Non-Federal Reservoirs, including enlargements that are constructed in the previous year.

Owners/operators of Non-Federal Reservoirs with 200 Acre-feet of storage capacity or greater at the principal spillway elevation will be required to provide an area-capacity survey from State-approved plans or prepared by a licensed professional engineer or land surveyor.

B. RRCA Groundwater Model Data Input Files

1. Monthly groundwater pumping, surface water recharge, groundwater recharge, and precipitation recharge provided by county and indexed to the one square mile cell size.
2. Potential Evapotranspiration rate is set as a uniform rate for all phreatophyte vegetative classes – the amount is X at Y climate stations and is interpolated spatially using kriging.

C. Inputs to RRCA Accounting

1. Surface Water Information

- a. Streamflow gaging station records: obtained as preliminary USGS or Nebraska streamflow records, with adjustments to reflect a calendar year, at the following locations:

Arikaree River at Haigler, Nebraska
North Fork Republican River at Colorado-Nebraska state line
Buffalo Creek near Haigler, Nebraska
Rock Creek at Parks, Nebraska
South Fork Republican River near Benkelman, Nebraska
Frenchman Creek at Culbertson, Nebraska
Red Willow Creek near Red Willow, Nebraska
Medicine Creek below Harry Strunk Lake, Nebraska*
Beaver Creek near Beaver City, Nebraska*
Sappa Creek near Stamford, Nebraska
Prairie Dog Creek near Woodruff, Kansas
Courtland Canal at Nebraska-Kansas state line
Republican River near Hardy, Nebraska
Republican River at Superior-Courtland Diversion Dam near Guide Rock,
Nebraska (new)*

- b. Federal reservoir information: obtained from the United States Bureau of Reclamation:

Daily free water surface evaporation, storage, precipitation, reservoir release information, and updated area-capacity tables.

Federal Reservoirs:
Bonny Reservoir

Swanson Lake
Harry Strunk Lake
Hugh Butler Lake
Enders Reservoir
Keith Sebelius Lake
Harlan County Lake
Lovewell Reservoir

- c. Non-federal reservoirs obtained by each state: an updated inventory of reservoirs that includes the location, surface area (acres), and capacity (in Acre-feet), of each non-federal reservoir with storage capacity of fifteen (15) Acre-feet or greater at the principal spillway elevation. Supporting data to substantiate the average surface water areas that are different than the presumptive average annual surface area may be tendered by the offering State.

- d. Diversions and related data from USBR

Irrigation diversions by canal, ditch, and pumping station that irrigate more than two (2) acres
Diversions for non-irrigation uses greater than 50 Acre-feet
Farm Deliveries
Wasteway measurements
Irrigated acres

- e. Diversions and related data – from each respective State

Irrigation diversions by canal, ditch, and pumping station that irrigate more than two (2) acres
Diversions for non-irrigation uses greater than 50 Acre-feet
Wasteway measurements, if available

2. Groundwater Information

(From the RRCA Groundwater model as output files as needed for the accounting procedures)

- a. Imported water - mound credits in amount and time that occur in defined streamflow points/reaches of measurement or compliance – ex: gaging stations near confluence or state lines

- b. Groundwater depletions to streamflow (above points of measurement or compliance – ex: gaging stations near confluence or state lines)

3. Summary

The aforementioned data will be aggregated by Sub-basin as needed for RRCA accounting.

D. Verification

1. Documentation to be Available for Inspection Upon Request

- a. Well permits/ registrations database
- b. Copies of well permits/ registrations issued in calendar year
- c. Copies of surface water right permits or decrees
- d. Change in water right/ transfer historic use analyses
- e. Canal, ditch, or other surface water diversion records
- f. Canal, ditch, or other surface water measurements
- g. Reservoir storage and release records
- h. Irrigated acreage

2. Site Inspection

- a. Accompanied – reasonable and mutually acceptable schedule among representative state and/or federal officials.
- b. Unaccompanied – inspection parties shall comply with all laws and regulations of the State in which the site inspection occurs.

Table 1: Annual Virgin and Computed Water Supply, Allocations and Computed Beneficial Consumptive Uses by State, Main Stem and Sub-basin

Designated Drainage Basin	Col. 1: Virgin Water Supply	Col. 2: Computed Water Supply	Col. 3: Allocations				Col. 4: Computed Beneficial Consumptive Use		
			Colorado	Nebraska	Kansas	Unallocated	Colorado	Nebraska	Kansas
North Fork in Colorado									
Arikaree									
Buffalo									
Rock									
South Fork of Republican River									
Frenchman									
Driftwood									
Red Willow									
Medicine									
Beaver									
Sappa									
Prairie Dog									
North Fork of Republican River in Nebraska and Main Stem									
Total All Basins									
North Fork Of Republican River in Nebraska and Mainstem Including Unallocated Water									
Total									

Table 2: Original Compact Virgin Water Supply and Allocations

Designated Drainage Basin	Virgin Water Supply	Colorado Allocation	% of Total Drainage Basin Supply	Kansas Allocation	% of Total Drainage Basin Supply	Nebraska Allocation	% of Total Drainage Basin Supply	Unallocated	% of Total Drainage Basin Supply
North Fork - CO	44,700	10,000	22.4			11,000	24.6	23,700	53.0
Arikaree River	19,610	15,400	78.5	1,000	5.1	3,300	16.8	-90	-0.4
Buffalo Creek	7,890					2,600	33.0	5,290	67.0
Rock Creek	11,000					4,400	40.0	6,600	60.0
South Fork	57,200	25,400	44.4	23,000	40.2	800	1.4	8,000	14.0
Frenchman Creek	98,500					52,800	53.6	45,700	46.4
Driftwood Creek	7,300			500	6.9	1,200	16.4	5,600	76.7
Red Willow Creek	21,900					4,200	19.2	17,700	80.8
Medicine Creek	50,800					4,600	9.1	46,200	90.9
Beaver Creek	16,500	3,300	20.0	6,400	38.8	6,700	40.6	100	0.6
Sappa Creek	21,400			8,800	41.1	8,800	41.1	3,800	17.8
Prairie Dog Creek	27,600			12,600	45.7	2,100	7.6	12,900	46.7
Sub-total Tributaries	384,400							175,500	
Main Stem + Blackwood Creek	94,500								
Main Stem + Unallocated	270,000			138,000	51.1	132,000	48.9		
Total	478,900	54,100		190,300		234,500			

Table 3A: Table to Be Used to Calculate Colorado's Five-Year Running Average Allocation and Computed Beneficial Consumptive Use for Determining Compact Compliance

Colorado				
	Col. 1	Col. 2	Col. 3	Col. 4
Year	Allocation	Computed Beneficial Consumptive	Imported Water Supply Credit	Difference between Allocation and the Computed Beneficial Consumptive Use offset by Imported Water Supply Credit Col 1 – (Col 2- Col 3)
Year t= -4				
Year t= -3				
Year t= -2				
Year t= -1				
Current Year t= 0				
Average				

Table 3B. Table to Be Used to Calculate Kansas's Five-Year Running Average Allocation and Computed Beneficial Consumptive Use for Determining Compact Compliance

Kansas				
	Col. 1	Col. 2	Col. 3	Col. 4
Year	Allocation	Computed Beneficial Consumptive	Imported Water Supply Credit	Difference between Allocation and the Computed Beneficial Consumptive Use offset by Imported Water Supply Credit Col 1 – (Col 2- Col 3)
Year t= -4				
Year t= -3				
Year t= -2				
Year t= -1				
Current Year t= 0				
Average				

Table 3C. Table to Be Used to Calculate Nebraska's Five-Year Running Average Allocation and Computed Beneficial Consumptive Use for Determining Compact Compliance

Nebraska				
	Col. 1	Col. 2	Col. 3	Col. 4
Year	Allocation	Computed Beneficial Consumptive	Imported Water Supply Credit	Difference between Allocation and the Computed Beneficial Consumptive Use offset by Imported Water Supply Credit Col 1 – (Col 2- Col 3)
Year T= -4				
Year T= -3				
Year T= -2				
Year T= -1				
Current Year T= 0				
Average				

Table 4A: Colorado Compliance with the Sub-basin Non-impairment Requirement

	Col 1	Col 2	Col 3	Col 4	Col 5	Col 6
Sub-basin	Colorado Sub-basin Allocation (5-year running average)	Unallocated Supply (5-year running average)	Credits from Imported Water Supply (5-year running average)	Total Supply Available = Col 1+ Col 2 + Col 3 (5-year running average)	Colorado Computed Beneficial Consumptive Use (5-year running average)	Difference Between Available Supply and Computed Beneficial Consumptive Use = Col 4 – Col 5 (5-year running average)
North Fork Republican River Colorado						
Arikaree River						
South Fork Republican River						
Beaver Creek						

Table 4B: Kansas Compliance with the Sub-basin Non-impairment Requirement

	Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7
Sub-basin	Kansas Sub-basin Allocation (5-year running average)	Unallocated Supply (5-year running average)	Unused Allocation from Colorado (5-year running average)	Credits from Imported Water Supply (5-year running average)	Total Supply Available = Col 1+ Col 2+ Col 3 + Col 4 (5-year running average)	Kansas Computed Beneficial Consumptive Use (5-year running average)	Difference Between Available Supply and Computed Beneficial Consumptive Use = Col 5 – Col 6 (5-year running average)
Arikaree River							
South Fork Republican River							
Driftwood Creek							
Beaver Creek							
Sappa Creek							
Prairie Dog Creek							

Table 5A: Colorado Compliance During Water-Short Year Administration

Colorado				
	Col. 1	Col. 2	Col. 3	Col 4
Year	Allocation minus Allocation for Beaver Creek	Computed Beneficial Consumptive minus Computed Beneficial Consumptive Use for Beaver Creek	Imported Water Supply Credit excluding Beaver Creek	Difference between Allocation and the Computed Beneficial Consumptive Use offset by Imported Water Supply Credit for All Basins Except Beaver Creek Col 1 – (Col 2 – Col 3)
Year T= -4				
Year T= -3				
Year T= -2				
Year T= -1				
Current Year T= 0				
Average				

Table 5B: Kansas Compliance During Water-Short Year Administration

Kansas						
Year	Allocation			Computed Beneficial Consumptive Use`	Imported Water Supply Credit	Difference Between Allocation and the Computed Beneficial Consumptive Use offset by Imported Water Supply Credit
Column	1	2	3	4	5	6
	Sum Sub-basins	Kansas's Share of the Unallocated Supply	Total Col 1 + Col 2			Col 3 – (Col 4 – Col 5)
Previous Year						
Current Year						
Average						

Table 5C: Nebraska Compliance During Water-Short Year Administration

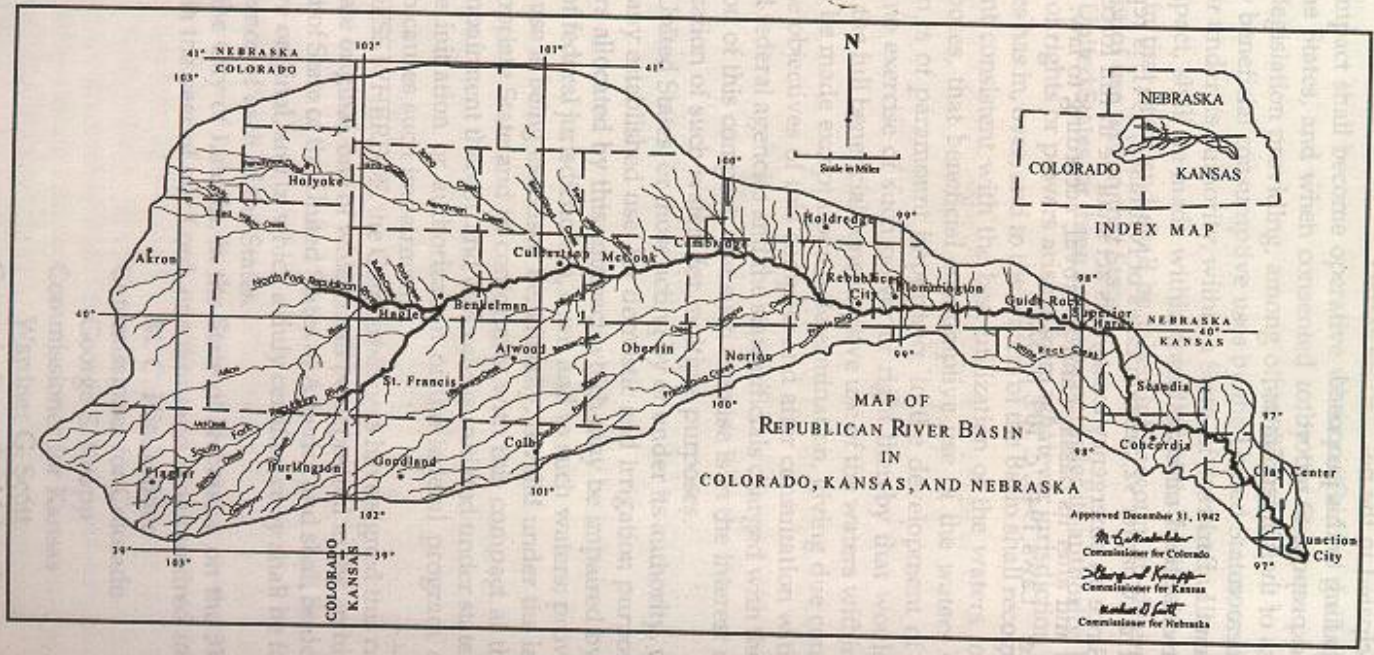
Nebraska								
Year	Allocation			Computed Beneficial Consumptive Use			Imported Water Supply Credit	Difference Between Allocation and the Computed Beneficial Consumptive Use offset by Imported Water Supply Credit Above Guide Rock
Column	Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8
	State Wide Allocation	Allocation below Guide Rock	State Wide Allocation above Guide Rock	State Wide CBCU	CBCU below Guide Rock	State Wide CBCU above Guide Rock	Credits above Guide Rock	Col 3 – (Col 6 – Col 7)
Previous Year								
Current Year								
Average								

Year	Allocation			Computed Beneficial Consumptive Use			Imported Water Supply Credit	Difference Between Allocation and the Computed Beneficial Consumptive Use offset by Imported Water Supply Credit Above Guide Rock
Column	Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8
	State Wide Allocation	Allocation below Guide Rock	State Wide Allocation above Guide Rock	State Wide CBCU	CBCU below Guide Rock	State Wide CBCU above Guide Rock	Credits above Guide Rock	Col 3 – (Col 6- Col 7)
Year = -2								
Year = -1								
Current Year								
Three-Year Average								
Sum of Previous Two-year Difference								
Expected Decrease in CBCU Under Plan								

Table 5E: Nebraska Tributary Compliance During Water-Short Year Administration

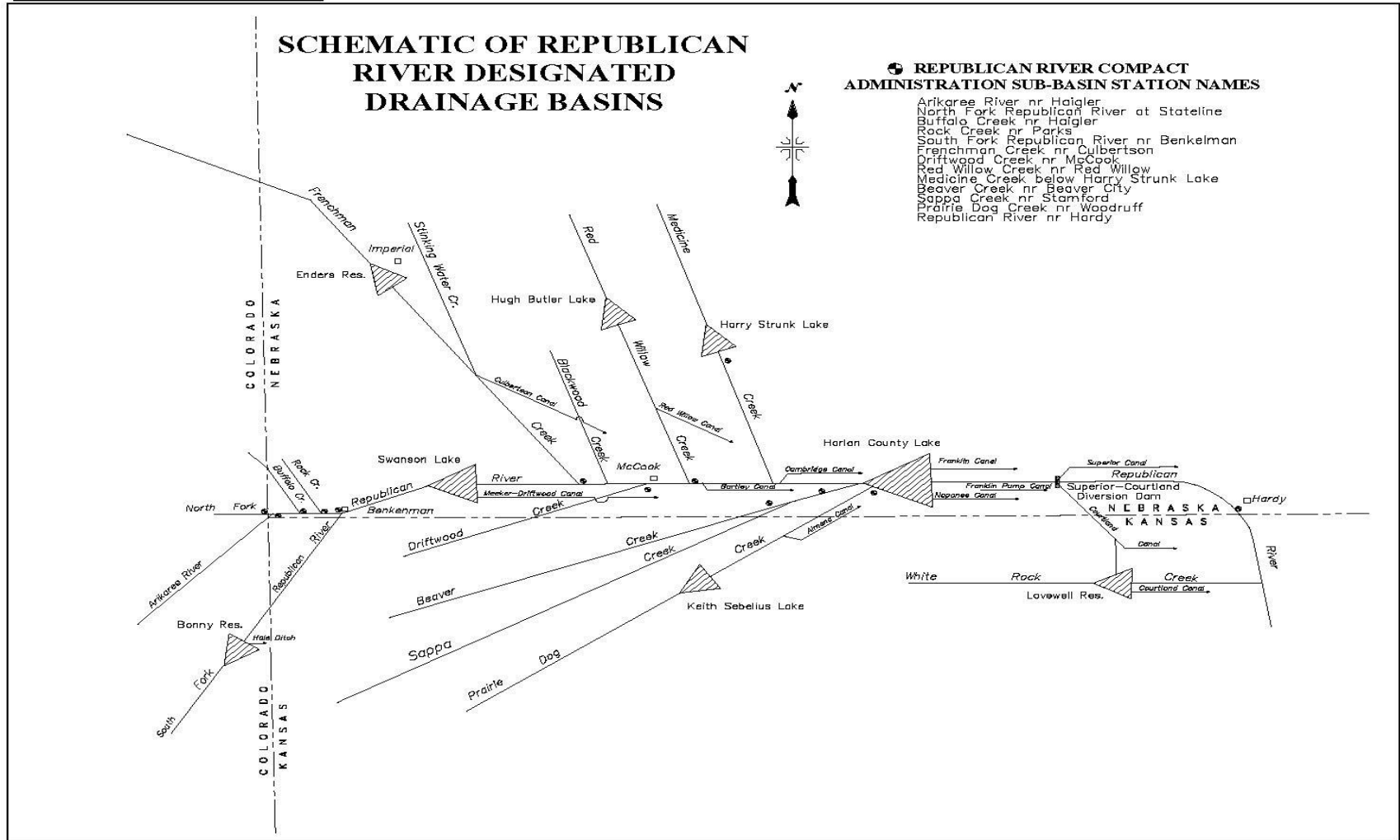
Year	Sum of Nebraska Sub-basin Allocations	Sum of Nebraska's Share of Sub-basin Unallocated Supplies	Total Available Water Supply for Nebraska	Computed Beneficial Consumptive Use	Imported Water Supply Credit	Difference between Allocation And the Computed Beneficial Consumptive Use offset by Imported Water Supply Credit
	Col 1	Col 2	Col 3	Col 4	Col 5	Col 6
Previous Year						Col 3 -(Col 4-Col 5)
Current Year						
Average						

Figure 1



Basin Map Attached to Compact that Shows the Streams and the Basin Boundaries

Figure 2



Line Diagram of Designated Drainage Basins Showing Federal Reservoirs and Sub-basin Gaging Stations

Attachment 1: Sub-basin Flood Flow Thresholds

Sub-basin	Sub-basin Flood Flow Threshold Acre-feet per Year ³
Arikaree River	16,400
North Fork of Republican River	33,900
Buffalo Creek	4,800
Rock Creek	9,800
South Fork of Republican River	30,400
Frenchman Creek	51,900
Driftwood Creek	9,400
Red Willow Creek	15,100
Medicine Creek	55,100
Beaver Creek	13,900
Sappa Creek	26,900
Prairie Dog	15,700

³ Flows considered to be Flood Flows are flows in excess of the 94% flow based on a flood frequency analysis for the years 1971-2000. The Gaged Flows are measured after depletions by Beneficial Consumptive Use and change in reservoir storage.

Attachment 2: Description of the Consensus Plan for Harlan County Lake

The Consensus Plan for operating Harlan County Lake was conceived after extended discussions and negotiations between Reclamation and the Corps. The agreement shaped at these meetings provides for sharing the decreasing water supply into Harlan County Lake. The agreement provides a consistent procedure for: updating the reservoir elevation/storage relationship, sharing the reduced inflow and summer evaporation, and providing a January forecast of irrigation water available for the following summer.

During the interagency discussions the two agencies found agreement in the following areas:

- The operating plan would be based on current sediment accumulation in the irrigation pool and other zones of the project.
- Evaporation from the lake affects all the various lake uses in proportion to the amount of water in storage for each use.
- During drought conditions, some water for irrigation could be withdrawn from the sediment pool.
- Water shortage would be shared between the different beneficial uses of the project, including fish, wildlife, recreation and irrigation.

To incorporate these areas of agreement into an operation plan for Harlan County Lake, a mutually acceptable procedure addressing each of these items was negotiated and accepted by both agencies.

1. Sediment Accumulation.

The most recent sedimentation survey for Harlan County project was conducted in 1988, 37 years after lake began operation. Surveys were also performed in 1962 and 1972; however, conclusions reached after the 1988 survey indicate that the previous calculations are unreliable. The 1988 survey indicates that, since closure of the dam in 1951, the accumulated sediment is distributed in each of the designated pools as follows:

Flood Pool	2,387 Acre-feet
Irrigation Pool	4,853 Acre-feet
Sedimentation Pool	33,527 Acre-feet

To insure that the irrigation pool retained 150,000 Acre-feet of storage, the bottom of the irrigation pool was lowered to 1,932.4 feet, msl, after the 1988 survey.

To estimate sediment accumulation in the lake since 1988, we assumed similar conditions have occurred at the project during the past 11 years. Assuming a consistent rate of deposition since 1988, the irrigation pool has trapped an additional 1,430 Acre-feet.

A similar calculation of the flood control pool indicates that the flood control pool has captured an additional 704 Acre-feet for a total of 3,090 Acre-feet since construction.

The lake elevations separating the different pools must be adjusted to maintain a 150,000-acre-foot irrigation pool and a 500,000-acre-foot flood control pool. Adjusting these elevations results in the following new elevations for the respective pools (using the 1988 capacity tables).

Top of Irrigation Pool	1,945.70 feet, msl
Top of Sediment Pool	1,931.75 feet, msl

Due to the variability of sediment deposition, we have determined that the elevation capacity relationship should be updated to reflect current conditions. We will complete a new sedimentation survey of Harlan County Lake this summer, and new area capacity tables should be available by early next year. The new tables may alter the pool elevations achieved in the Consensus Plan for Harlan County Lake.

2. Summer Evaporation.

Evaporation from a lake is affected by many factors including vapor pressure, wind, solar radiation, and salinity of the water. Total water loss from the lake through evaporation is also affected by the size of the lake. When the lake is lower, the surface area is smaller and less water loss occurs. Evaporation at Harlan County Lake has been estimated since the lake's construction using a Weather Service Class A pan which is 4 feet in diameter and 10 inches deep. We and Reclamation have jointly reviewed this information and assumed future conditions to determine an equitable method of distributing the evaporation loss from the project between irrigation and the other purposes.

During those years when the irrigation purpose expected a summer water yield of 119,000 Acre-feet or more, it was determined that an adequate water supply existed and no sharing of evaporation was necessary. Therefore, evaporation evaluation focused on the lower pool elevations when water was scarce. Times of water shortage would also generally be times of higher evaporation rates from the lake.

Reclamation and we agreed that evaporation from the lake during the summer (June through September) would be distributed between the irrigation and sediment pools based on their relative percentage of the total storage at the time of evaporation. If the sediment pool held 75 percent of the total storage, it would be charged 75 percent of the evaporation. If the sediment pool held 50 percent of the total storage, it would be charged 50 percent of the evaporation. At the bottom of the irrigation pool (1,931.75 feet, msl) all of the evaporation would be charged to the sediment pool.

Due to downstream water rights for summer inflow, neither the irrigation nor the sediment pool is credited with summer inflow to the lake. The summer inflows would be

assumed passed through the lake to satisfy the water right holders. Therefore, Reclamation and we did not distribute the summer inflow between the project purposes.

As a result of numerous lake operation model computer runs by Reclamation, it became apparent that total evaporation from the project during the summer averaged about 25,000 Acre-feet during times of lower lake elevations. These same models showed that about 20 percent of the evaporation should be charged to the irrigation pool, based on percentage in storage during the summer months. About 20 percent of the total lake storage is in the irrigation pool when the lake is at elevation 1,935.0 feet, msl. As a result of the joint study, Reclamation and we agreed that the irrigation pool would be credited with 20,000 Acre-feet of water during times of drought to share the summer evaporation loss.

Reclamation and we further agreed that the sediment pool would be assumed full each year. In essence, if the actual pool elevation were below 1,931.75 feet, msl, in January, the irrigation pool would contain a negative storage for the purpose of calculating available water for irrigation, regardless of the prior year's summer evaporation from sediment storage.

3. Irrigation withdrawal from sediment storage.

During drought conditions, occasional withdrawal of water from the sediment pool for irrigation is necessary. Such action is contemplated in the Field Working Agreement and the Harlan County Lake Regulation Manual: "Until such time as sediment fully occupies the allocated reserve capacity, it will be used for irrigation and various conservation purposes, including public health, recreation, and fish and wildlife preservation."

To implement this concept into an operation plan for Harlan County Lake, Reclamation and we agreed to estimate the net spring inflow to Harlan County Lake. The estimated inflow would be used by the Reclamation to provide a firm projection of water available for irrigation during the next season.

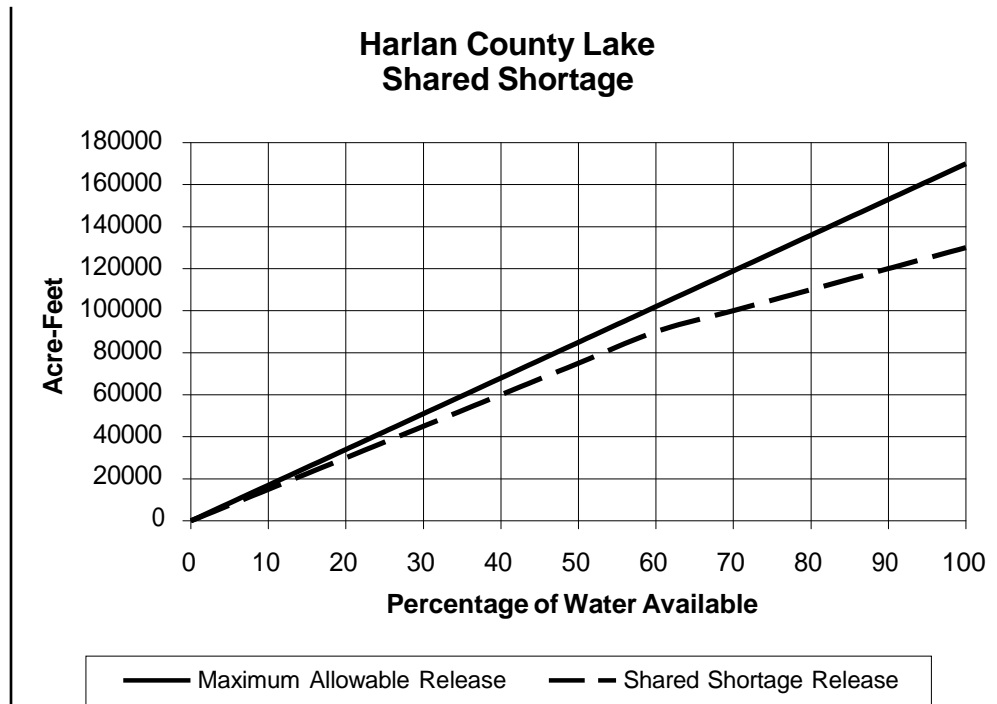
Since the construction of Harlan County Lake, inflows to the lake have been depleted by upstream irrigation wells and farming practices. Reclamation has recently completed an in-depth study of these depleted flows as a part of their contract renewal process. The study concluded that if the current conditions had existed in the basin since 1931, the average spring inflow to the project would have been 57,600 Acre-feet of water. The study further concluded that the evaporation would have been 8,800 Acre-feet of water during the same period. Reclamation and we agreed to use these values to calculate the net inflow to the project under the current conditions.

In addition, both agencies also recognized that the inflow to the project could continue to decrease with further upstream well development and water conservation farming. Due to these concerns, Reclamation and we determined that the previous 5-year inflow values would be averaged each year and compared to 57,600 Acre-feet. The inflow estimate for Harlan County Lake would be the smaller of these two values.

The estimated inflow amount would be used in January of each year to forecast the amount of water stored in the lake at the beginning of the irrigation season. Based on this forecast, the irrigation districts would be provided a firm estimate of the amount of water available for the next season. The actual storage in the lake on May 31 would be reviewed each year. When the actual water in storage is less than the January forecast, Reclamation may draw water from sediment storage to make up the difference.

4. Water Shortage Sharing.

A final component of the agreement involves a procedure for sharing the water available during times of shortage. Under the shared shortage procedure, the irrigation purpose of the project would remove less water than otherwise allowed and alleviate some of the adverse effects to the other purposes. The procedure would also extend the water supply during times of drought by “banking” some water for the next irrigation season. The following graph illustrates the shared shortage releases.



5. Calculation of Irrigation Water Available

Each January, the Reclamation would provide the Bostwick irrigation districts a firm estimate of the quantity of water available for the following season. The firm estimate of water available for irrigation would be calculated by using the following equation and shared shortage adjustment:

$$\text{Storage} + \text{Summer Sediment Pool Evaporation} + \text{Inflow} - \text{Spring Evaporation} = \text{Maximum Irrigation Water Available}$$

The variables in the equation are defined as:

- Maximum Irrigation Water Available. Maximum irrigation supply from Harlan County Lake for that irrigation season.
- Storage. Actual storage in the irrigation pool at the end of December. The sediment pool is assumed full. If the pool elevation is below the top of the sediment pool, a negative irrigation storage value would be used.
- Inflow. The inflow would be the smaller of the past 5-year average inflow to the project from January through May, or 57,600 Acre-feet.
- Spring Evaporation. Evaporation from the project would be 8,800 Acre-feet which is the average January through May evaporation.
- Summer Sediment Pool Evaporation. Summer evaporation from the sediment pool during June through September would be 20,000 Acre-feet. This is an estimate based on lower pool elevations, which characterize the times when it would be critical to the computations.

6. Shared Shortage Adjustment

To ensure that an equitable distribution of the available water occurs during short-term drought conditions, and provide for a “banking” procedure to increase the water stored for subsequent years, a shared shortage plan would be implemented. The maximum water available for irrigation according to the above equation would be reduced according to the following table. Linear interpolation of values will occur between table values.

Shared Shortage Adjustment Table

Irrigation Water Available (Acre-feet)	Irrigation Water Released (Acre-feet)
0	0
17,000	15,000
34,000	30,000
51,000	45,000
68,000	60,000
85,000	75,000
102,000	90,000
119,000	100,000
136,000	110,000
153,000	120,000
170,000	130,000

7. Annual Shutoff Elevation for Harlan County Lake

The annual shutoff elevation for Harlan County Lake would be estimated each January and finally established each June.

The annual shutoff elevation for irrigation releases will be estimated by Reclamation each January in the following manner:

1. Estimate the May 31 Irrigation Water Storage (IWS) (Maximum 150,000 Acre-feet) by taking the December 31 irrigation pool storage plus the January-May inflow estimate (57,600 Acre-feet or the average inflow for the last 5-year period, whichever is less) minus the January-May evaporation estimate (8,800 Acre-feet).
2. Calculate the estimated Irrigation Water Available, including all summer evaporation, by adding the Estimated Irrigation Water Storage (from item 1) to the estimated sediment pool summer evaporation (20,000 AF).
3. Use the above Shared Shortage Adjustment Table to determine the acceptable Irrigation Water Release from the Irrigation Water Available.
4. Subtract the Irrigation Water Release (from item 3) from the Estimated IWS (from item 1). The elevation of the lake corresponding to the resulting irrigation storage is the Estimated Shutoff Elevation. The shutoff elevation will not be below the bottom of the irrigation pool if over 119,000 AF of water is supplied to the districts, nor below 1,927.0 feet, msl. If the shutoff elevation is below the irrigation pool, the maximum irrigation release is 119,000 AF.

The annual shutoff elevation for irrigation releases would be finalized each June in accordance with the following procedure:

1. Compare the estimated May 31 IWS with the actual May 31 IWS.
2. If the actual end of May IWS is less than the estimated May IWS, lower the shutoff elevation to account for the reduced storage.
3. If the actual end of May IWS is equal to or greater than the estimated end of May IWS, the estimated shutoff elevation is the annual shutoff elevation.
4. The shutoff elevation will never be below elevation 1,927.0 feet, msl, and will not be below the bottom of the irrigation pool if more than 119,000 Acre-feet of water is supplied to the districts.

Attachment 3: Inflows to Harlan County Lake 1993 Level of Development

BASELINE RUN - 1993 LEVEL INFLOW TO HARLAN COUNTY RESERVOIR

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1931	10.2	10.8	13.4	5.0	18.8	15.8	4.3	1.8	1.8	0.0	0.1	0.1	82.1
1932	6.8	16.6	18.5	4.6	3.8	47.6	3.8	2.8	4.8	0.0	0.0	0.4	109.7
1933	0.4	0.0	3.9	30.2	31.0	5.4	1.8	0.0	10.4	0.0	2.6	5.5	91.2
1934	2.1	0.0	3.2	1.8	0.7	7.3	0.8	0.0	1.3	0.0	2.2	0.0	19.4
1935	0.3	0.1	0.7	4.2	0.8	389.3	6.1	19.1	26.1	2.4	5.2	0.9	455.2
1936	0.3	0.0	11.9	0.0	35.9	4.7	0.4	0.0	1.8	0.0	1.6	3.8	60.4
1937	4.8	12.9	6.0	2.5	0.0	12.6	6.3	6.9	2.4	0.0	0.0	12.4	66.8
1938	9.9	7.8	8.7	10.4	18.7	8.6	7.3	7.8	4.9	0.2	0.0	4.7	89.0
1939	2.7	7.5	9.6	12.2	6.6	13.3	5.0	4.1	0.0	0.0	0.0	0.0	61.0
1940	0.0	0.0	12.2	5.2	4.6	23.7	2.8	3.2	0.0	3.6	0.0	1.4	56.7
1941	0.0	10.6	10.6	7.7	17.2	67.1	28.9	19.7	14.9	8.3	6.7	7.1	198.8
1942	3.3	10.6	0.5	34.1	30.8	83.9	11.7	10.9	36.5	3.1	8.7	0.3	234.4
1943	1.2	11.2	14.6	31.4	4.7	28.3	4.8	0.3	0.9	0.0	0.0	11.8	109.2
1944	0.1	4.3	9.0	43.1	31.9	63.9	26.6	15.4	0.5	0.3	3.0	4.5	202.6
1945	4.3	7.8	5.7	9.5	4.1	53.5	5.0	0.9	1.5	5.0	6.0	6.3	109.6
1946	5.9	11.2	9.3	4.9	7.0	3.1	1.6	11.4	28.1	129.9	25.0	12.1	249.5
1947	1.1	3.2	10.4	8.2	11.9	195.4	22.3	5.9	2.9	0.2	0.3	0.3	262.1
1948	6.2	9.8	24.1	5.4	0.2	39.8	13.5	6.8	4.2	0.0	0.1	0.1	110.2
1949	2.0	1.5	25.2	16.3	49.0	57.4	9.2	5.5	2.1	3.0	2.8	0.3	174.3
1950	0.3	5.7	10.8	10.9	28.9	10.1	12.7	9.3	7.8	7.2	3.8	3.1	110.6
1951	3.8	3.4	7.1	5.3	42.0	39.9	42.1	10.1	36.0	15.5	14.8	8.9	228.9
1952	16.4	21.4	26.3	23.8	34.6	4.0	9.3	3.1	1.5	11.7	4.3	0.1	156.5
1953	1.8	4.6	5.3	3.3	15.1	9.5	1.8	0.2	0.0	0.0	2.8	0.1	44.5
1954	1.0	6.8	1.9	3.2	7.1	2.4	0.0	1.2	0.0	0.0	0.0	0.0	23.6
1955	0.0	4.0	6.3	4.8	2.9	6.4	2.7	0.0	1.4	0.0	0.0	0.0	28.5
1956	1.6	3.4	2.9	2.4	1.3	1.5	0.0	0.6	0.0	0.0	0.0	0.0	13.7
1957	0.0	4.1	6.2	12.8	3.5	62.4	21.3	1.2	2.0	3.4	4.5	4.7	126.1
1958	0.8	3.0	14.2	14.0	18.7	1.3	3.4	2.2	0.0	0.4	0.0	0.6	58.6
1959	1.9	15.4	16.4	8.5	13.6	4.2	1.4	1.2	0.0	4.3	1.0	4.5	72.4
1960	1.4	12.3	71.4	23.9	21.7	53.7	14.1	3.2	0.0	0.0	0.2	2.8	204.7
1961	2.3	6.4	7.7	7.4	26.5	24.0	7.2	4.9	0.0	2.3	4.8	1.7	95.2

Attachment 3: Inflows to Harlan County Lake 1993 Level of Development

BASELINE RUN - 1993 LEVEL INFLOW TO HARLAN COUNTY RESERVOIR

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1962	4.5	9.1	16.2	9.9	14.4	42.6	41.6	21.1	2.3	8.7	8.3	5.7	184.4
1963	3.4	18.2	18.2	15.0	12.7	14.7	3.4	6.1	8.7	0.8	5.3	1.8	108.3
1964	5.4	7.6	8.3	8.4	9.9	11.9	7.2	6.5	2.4	1.9	1.4	2.3	73.2
1965	6.0	8.1	11.1	12.8	32.8	40.0	22.9	6.5	37.2	53.7	19.5	11.0	261.6
1966	8.9	21.4	15.7	11.4	12.0	34.7	12.4	2.5	3.5	5.4	6.8	5.7	140.4
1967	7.2	11.5	11.5	12.9	9.1	75.3	43.7	15.3	4.4	7.3	6.9	5.4	210.5
1968	3.9	10.2	8.5	11.6	10.8	12.5	3.1	2.7	1.6	2.0	4.3	3.4	74.6
1969	4.2	10.8	24.5	15.1	18.9	17.5	17.0	12.6	16.6	9.2	11.8	9.9	168.1
1970	3.5	8.7	8.5	10.5	11.1	7.7	4.6	3.2	0.5	3.3	4.7	4.5	70.8
1971	4.1	10.3	12.4	12.8	18.3	7.2	8.4	6.2	1.9	4.2	7.3	7.1	100.2
1972	5.5	8.1	9.2	8.3	14.8	8.5	6.5	4.4	0.1	2.9	7.6	4.1	80.0
1973	11.4	14.2	19.0	16.2	17.4	20.9	9.1	1.9	8.4	19.6	11.9	13.2	163.2
1974	13.2	13.4	12.0	14.3	15.4	17.2	5.5	0.0	0.0	0.0	4.9	5.5	101.4
1975	7.2	8.2	13.6	14.8	12.0	48.1	11.6	7.4	0.1	3.0	6.2	7.3	139.5
1976	7.0	10.2	10.1	16.0	12.1	3.5	2.2	1.8	0.9	1.0	3.2	3.1	71.1
1977	4.4	9.6	12.9	21.2	31.5	12.1	5.9	1.9	10.6	4.1	5.5	5.3	125.0
1978	5.0	6.5	20.6	12.9	11.8	3.8	0.0	1.0	0.0	0.0	0.3	1.6	63.5
1979	1.3	7.6	21.5	18.8	15.9	5.4	10.4	10.6	1.6	0.9	3.6	6.2	103.8
1980	5.7	9.3	11.6	15.2	10.4	2.1	2.5	0.0	0.0	0.0	2.5	2.2	61.5
1981	5.5	6.0	11.6	14.9	22.5	6.4	11.5	16.3	4.3	2.5	6.7	6.2	114.4
1982	5.3	12.5	17.9	14.3	26.8	27.1	8.9	2.7	0.0	6.5	6.3	15.5	143.8
1983	6.5	9.7	27.2	16.4	41.4	74.2	10.7	7.6	3.8	3.1	6.7	5.2	212.5
1984	6.8	14.6	17.2	32.9	40.6	15.5	8.1	4.5	0.0	5.5	4.8	6.2	156.7
1985	6.9	14.1	13.6	11.9	27.4	9.9	10.0	2.0	6.0	8.5	5.6	5.8	121.7
1986	9.1	9.4	12.2	11.7	34.3	13.0	13.5	4.6	3.3	5.9	5.4	7.1	129.5
1987	5.9	9.2	19.7	24.1	24.3	11.7	19.0	5.7	2.3	2.7	8.2	7.0	139.8
1988	6.2	13.7	11.6	15.2	15.2	7.0	17.9	10.4	0.6	2.0	5.9	5.4	111.1
1989	5.4	5.9	10.5	9.1	11.4	11.8	14.0	6.2	0.2	3.1	3.1	3.5	84.2
1990	6.6	7.7	13.2	9.7	15.5	1.4	4.3	10.7	0.6	3.2	2.0	2.7	77.6
1991	2.4	8.0	9.0	10.6	15.2	3.9	1.9	0.5	0.0	0.0	2.7	4.8	59.0
1992	8.0	8.8	12.7	8.5	4.5	6.1	6.5	9.4	2.4	6.9	6.7	5.2	85.7
1993	5.2	14.4	71.6	22.7	21.0	17.0	68.0	37.5	23.3	16.8	30.1	17.7	345.3
Avg	4.5	8.8	14.1	13.0	17.2	30.6	11.0	6.2	5.4	6.3	5.0	4.7	126.8

BASELINE - 1993 LEVEL FLOWS - HARLAN COUNTY EVAPORATION

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1931	0.7	0.9	1.6	2.9	4.2	7.4	6.9	5.2	2.7	2.1	1.2	0.4	36.2
1932	0.6	0.8	1.5	2.7	4.1	5.0	6.8	5.0	2.7	2.1	1.2	0.4	32.9
1933	0.6	0.8	1.4	2.5	3.8	7.8	6.1	4.2	2.7	2.1	1.2	0.4	33.6
1934	0.6	0.8	1.4	2.4	4.5	6.5	8.0	6.2	2.7	2.0	1.2	0.4	36.7
1935	0.6	0.8	1.3	2.3	2.2	3.6	9.7	6.2	3.1	2.5	1.4	0.5	34.2
1936	0.7	0.9	1.6	2.9	5.5	6.8	8.7	6.5	2.7	2.1	1.2	0.4	40.0
1937	0.6	0.8	1.4	2.5	3.6	4.0	6.2	6.5	2.7	2.1	1.2	0.4	32.0
1938	0.6	0.9	1.5	2.7	3.4	4.9	6.5	5.7	2.7	2.1	1.2	0.4	32.6
1939	0.6	0.8	1.4	2.6	4.3	4.9	6.8	4.6	2.7	2.1	1.2	0.4	32.4
1940	0.6	0.8	1.4	2.4	3.5	5.0	6.5	4.6	2.7	2.1	1.2	0.4	31.2
1941	0.6	0.8	1.4	2.5	3.9	4.2	6.7	5.3	2.8	2.1	1.3	0.5	32.1
1942	0.6	0.9	1.5	2.8	4.0	5.2	8.3	5.1	3.2	2.5	1.5	0.5	36.1
1943	0.7	1.0	1.8	3.2	4.3	5.7	7.9	6.3	2.7	2.1	1.2	0.4	37.3
1944	0.6	0.8	1.4	2.7	4.2	5.3	7.0	5.8	3.5	2.6	1.5	0.5	35.9
1945	0.7	1.0	1.8	3.1	3.8	3.0	6.7	5.7	2.9	2.2	1.3	0.5	32.7
1946	0.6	0.9	1.6	2.8	3.5	5.1	5.6	4.4	2.9	2.7	1.8	0.6	32.5
1947	1.0	1.5	2.9	3.2	3.4	-1.2	5.8	5.3	3.7	1.7	0.5	0.1	27.9
1948	0.8	0.7	1.5	3.6	3.1	2.4	4.2	4.7	3.0	2.7	0.8	0.3	27.8
1949	0.1	0.9	0.7	1.8	1.1	0.7	6.5	4.1	3.1	1.7	1.5	0.4	22.6
1950	0.7	0.1	0.8	2.8	2.0	5.6	0.8	2.8	4.5	2.3	1.6	0.6	24.6
1951	0.5	0.2	2.1	0.7	-0.1	1.9	3.5	4.1	0.4	3.1	2.2	0.9	19.5
1952	1.1	1.2	1.9	2.5	5.2	6.2	1.5	3.4	3.6	2.9	1.1	-0.1	30.5
1953	0.5	1.0	1.5	2.9	4.7	4.5	4.6	6.6	5.3	3.3	0.1	0.0	35.0
1954	0.7	0.6	2.2	3.6	0.3	4.9	6.7	1.6	3.6	1.6	1.5	0.6	27.9
1955	0.5	1.0	2.1	4.6	3.4	-0.5	7.3	6.9	2.7	2.6	1.4	0.4	32.4
1956	0.6	1.1	1.9	2.8	3.9	4.5	5.0	3.7	4.7	3.7	1.3	0.5	33.7
1957	0.7	1.0	1.3	0.5	-0.6	-1.1	6.1	3.7	2.3	1.7	1.2	0.4	17.2
1958	0.7	0.1	1.0	0.6	2.3	4.4	1.0	1.9	3.3	3.3	1.0	0.6	20.2
1959	0.4	1.0	1.1	2.1	1.0	3.5	5.0	4.8	2.3	0.7	1.5	0.6	24.0
1960	0.1	0.7	2.0	2.7	0.9	0.1	4.9	3.6	3.9	2.0	1.3	0.4	22.6
1961	0.9	1.0	1.4	2.7	-1.1	0.6	5.1	2.9	1.2	2.4	0.7	0.1	17.9

Attachment 4: Evaporation Loss Harlan County Lake 1993 Level of Development

BASELINE - 1993 LEVEL FLOWS - HARLAN COUNTY EVAPORATION

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1962	0.6	0.6	0.9	3.7	3.4	1.5	0.3	1.6	2.0	2.0	1.7	0.3	18.6
1963	0.7	1.4	1.3	4.5	4.6	6.3	6.1	3.1	-0.8	2.7	1.5	0.4	31.8
1964	0.8	0.8	1.7	3.2	5.6	1.2	6.9	3.0	3.0	3.3	1.2	0.6	31.3
1965	0.4	0.7	1.2	2.8	1.5	-0.5	2.0	2.8	-3.9	1.7	2.1	0.4	11.2
1966	0.9	0.8	2.9	2.7	7.5	2.8	5.8	3.7	2.7	2.8	1.5	0.4	34.5
1967	0.7	1.2	2.5	3.0	2.0	-2.9	1.6	4.5	3.5	2.0	1.6	0.4	20.1
1968	0.9	1.2	2.8	2.6	3.2	4.9	4.7	1.8	2.3	0.7	1.2	0.2	26.5
1969	0.4	0.6	2.4	3.3	0.1	3.8	-0.7	2.9	2.2	-1.0	1.5	0.4	15.9
1970	0.7	1.4	2.3	2.8	4.7	4.4	6.5	5.9	0.9	1.0	1.5	0.7	32.8
1971	0.7	0.2	2.0	2.9	0.7	5.1	3.4	4.5	1.4	1.5	0.2	0.5	23.1
1972	0.8	1.3	2.0	1.7	1.1	0.0	3.3	1.8	2.1	1.7	-0.4	0.1	15.5
1973	0.5	1.1	-0.7	2.5	3.4	6.7	-1.7	4.2	-3.0	0.2	0.2	0.2	13.6
1974	0.7	1.5	2.6	1.5	3.7	2.5	9.1	2.6	3.4	1.4	1.1	0.3	30.4
1975	0.7	0.7	2.0	2.1	0.8	1.1	4.3	2.7	3.0	3.4	0.7	0.6	22.1
1976	0.8	1.2	1.7	0.7	1.5	5.0	5.9	5.7	-0.2	1.4	1.4	0.7	25.8
1977	0.7	1.3	0.2	1.1	0.0	4.6	4.0	0.6	2.0	1.6	1.0	0.4	17.5
1978	0.5	0.7	1.2	3.4	3.9	6.2	7.1	4.5	4.5	3.0	1.1	0.5	36.6
1979	0.5	0.6	1.1	3.9	4.4	4.6	3.5	5.1	4.1	2.8	1.4	0.7	32.7
1980	0.5	0.6	1.2	3.4	3.7	4.7	6.8	6.0	3.9	2.7	1.3	0.6	35.4
1981	0.5	0.6	1.2	3.8	3.2	4.8	4.2	3.7	2.9	1.7	1.3	0.7	28.6
1982	0.5	0.7	1.2	3.9	3.8	3.9	5.1	3.8	2.9	2.2	1.4	0.8	30.2
1983	0.5	0.7	1.4	2.9	4.2	5.3	8.6	7.2	4.6	1.8	1.5	0.6	39.3
1984	0.6	0.8	1.4	2.9	4.2	5.8	7.2	5.7	4.7	1.4	1.4	0.7	36.8
1985	0.5	0.7	1.3	2.3	4.0	4.5	5.6	3.5	3.8	1.5	1.5	0.7	29.9
1986	0.6	0.7	1.3	2.8	4.4	5.8	6.7	4.0	2.7	1.3	1.4	0.7	32.4
1987	0.5	0.8	1.3	3.1	4.2	6.2	6.9	3.5	3.1	2.2	1.4	0.7	33.9
1988	0.5	0.7	1.3	3.5	4.9	6.6	4.6	4.8	3.5	2.2	1.4	0.7	34.7
1989	0.5	0.7	1.2	4.2	4.5	4.4	4.8	3.6	3.0	2.5	1.4	0.7	31.5
1990	0.5	0.7	1.2	3.0	3.5	5.6	6.4	4.0	5.0	3.4	1.4	0.6	35.3
1991	0.5	0.7	1.2	2.8	3.3	5.5	6.0	5.0	5.1	3.2	1.3	0.6	35.2
1992	0.6	0.7	1.2	1.8	3.2	2.2	4.1	3.5	4.2	2.9	1.9	1.0	27.3
1993	0.6	0.5	1.0	2.2	3.1	4.6	4.2	4.9	4.5	4.4	3.1	1.2	34.3
Avg	0.6	0.8	1.5	2.7	3.2	3.9	5.3	4.3	2.8	2.2	1.3	0.5	29.1

Attachment 5: Projected Water Supply Spread Sheet Calculations

Trigger Calculations Based on Harlan County Lake Irrigation Supply	Units-1000 Acre-feet		Irrigation Trigger		119.0		Assume that during irrigation release season HCL Inflow = Evaporation Loss						
			Total Irrigation Supply		130.0								
			Bottom Irrigation		164.1								
			Evaporation Adjust		20.0								
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
1993 Level AVE inflow	6.3	5	4.7	4.5	8.8	14.1	13.0	17.2	30.6	11.0	6.2	5.4	126.8
1993 Level AVE evap (1931-93)	2.2	1.3	0.5	0.6	0.8	1.5	2.7	3.2	3.9	5.3	4.3	2.8	29.1
Avg. Inflow Last 5 Years	10.8	13.0	12.3	12.9	16.6	22.4	19.4	18.1	14.8	16.5	11.0	4.7	172.6

Year 2001-2002 Oct - Jun Trigger and Irrigation Supply Calculation									
Calculation Month	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Previous EOM Content	236.5	235.9	238.6	242.9	248.1	255.1	263.8	269.6	276.2
Inflow to May 31	73.6	67.3	62.3	57.6	53.1	44.3	30.2	17.2	0.0
Last 5 Yrs Avg Inflow to May 31	125.6	114.8	101.7	89.5	76.6	59.9	37.5	18.1	0.0
Evap to May 31	12.8	10.6	9.3	8.8	8.2	7.4	5.9	3.2	0.0
Est. Cont May 31	297.3	292.6	291.6	291.7	293.0	292.0	288.1	283.6	276.2
Est. Elevation May 31	1944.44	1944.08	1944.00	1944.01	1944.11	1944.03	1943.72	1943.37	1942.77
Max. Irrigation Available	153.2	148.5	147.5	147.6	148.9	147.9	144.0	139.5	132.1
Irrigation Release Est.	120.1	117.4	116.8	116.8	118.1	117.1	116.8	116.8	116.8
Trigger - Yes/No	NO	YES	YES	YES	YES	YES	YES	YES	YES
130 kAF Irrigation Supply - Yes/No	NO	NO	NO	NO	NO	NO	NO	NO	NO

Attachment 5: Projected Water Supply Spread Sheet Calculations

Year 2002 Jul - Sep Final Trigger and Total Irrigation Supply Calculation				
CalculationMonth		Jul	Aug	Sep
Previous EOM Irrigation Release Est.		116.8	116.0	109.7
Previous Month Inflow		5.5	0.5	1.3
Previous Month Evap		6.3	6.8	6.6
Irrigation Release Estimate		116.0	109.7	104.4
Final Trigger - Yes/No		YES		
130 kAF Irrigation Supply - Yes/No		NO	NO	NO

Attachment 6: Computing Water Supplies and Consumptive Use Above Guide Rock

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
Total Main Stem VWS	Hardy gage	Superior-Courtland Diversion Dam Gage	Courtland Canal Diversions	Superior Canal Diversions	Courtland Canal Returns	Superior Canal Returns	Total Bostwick Returns Below Guide Rock	NE CBCU Below Guide Rock	KS CBCU Below Guide Rock	Total CBCU Below Guide Rock	Gain Guide Rock to Hardy	VWS Guide Rock to Hardy	Main Stem Virgin Water Supply Above Guide Rock	Nebraska Main Stem Allocation Above Hardy	Kansas Main Stem Allocation Above Hardy	Nebraska Guide Rock to Hardy Allocation	Kansas Guide Rock to Hardy Allocation
							Col F+ Col G			Col I+ Col J	+ Col B - Col C+ Col K - Col H	+ Col L + Col K	Col A - Col M	.489 x Col N	.511 x Col N	.489 x Col M	.511 x Col M

Attachment 7: Calculations of Return Flows from Bureau of Reclamation Canals

Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8	Col 9	Col 10	Col 11	Col 12
Canal	Canal Diversion	Spill to Waste-way	Net Diversion	Field Deliveries	Canal Loss	Average Field Loss Factor	Field Loss	Total Loss from District	Percent field and Canal Loss That Returns to the Stream	Total return to Stream from Canal and Field Loss	Return as Percent of Canal Diversion
Name Canal	Headgate Diversion	Sum of measured spills to river	Col 2 - Col 3	Sum of deliveries to the field	Col 4 – Col 5	1 – Weighted Average Efficiency of Application System for the District*	Col 5 x Col 7	Col 6 + Col 8	Estimated Percent Loss*	Col 9 x Col 10 + Col 3	Col 11 / Col 2
∑ Irrigation Season											
∑ Non-Irrigation Season											
Example	100	5	95	60	35	30%	18	53	82%	48.46	48.5%
	100	5	95	0	95	30%	0	95	92%	87.4	87.4%
Culbertson						30%			82%		
						30%			92%		
Culbertson Extension						30%			82%		
						30%			92%		
Meeker - Driftwood						30%			82%		
						30%			92%		
Red Willow						30%			82%		
						30%			92%		
Bartley						30%			82%		
						30%			92%		
Cambridge						30%			82%		
						30%			92%		
Naponee						35%			82%		
						35%			92%		
Franklin						35%			82%		
						35%			92%		
Franklin Pump						35%			82%		
						35%			92%		
Almena						30%			82%		
Superior						31%			82%		
						31%			92%		
Nebraska Courtland						23%			82%		
Courtland Canal Above Lovewell (KS)						23%			82%		
Courtland Canal Below Lovewell						23%			82%		

*The average field efficiencies for each district and percent loss that returns to the stream may be reviewed and, if necessary, changed by the RRCA to improve the accuracy of the estimates.

RESOLUTION OF THE REPUBLICAN RIVER COMPACT ADMINISTRATION

REGARDING REQUIRED CHANGES TO THE RRCA ACCOUNTING PROCEDURES AND REPORTING REQUIREMENTS REGARDING NON-IRRIGATION SEASON CANAL DIVERSIONS FOR GROUNDWATER RECHARGE PURPOSES

Whereas, the States of Kansas, Nebraska, and Colorado entered into a Final Settlement Stipulation (“FSS”) as of December 15, 2002, to resolve pending litigation in the United States Supreme Court regarding the Republican River Compact (“Compact”) in the case of *Kansas v. Nebraska and Colorado*, no. 126 Original;

Whereas, the FSS was approved by the United States Supreme Court on May 19, 2003;

Whereas, by memorandum dated May 14, 2015 and provided at the quarterly RRCA Engineering Committee Meeting on that same date, the state of Nebraska introduced the reformed RRCA Accounting Procedures and Reporting Requirements regarding non-irrigation season canal recharge diversions and the estimated percent loss assigned to those diversions.

Whereas, the proposed changes to the RRCA Accounting Procedures and Reporting Requirements shall be enacted for the accounting years 2016 and forward.

NOW THEREFORE BE IT RESOLVED, the Republican River Compact Administration approves and adopts the proposal set forth in Nebraska’s May 14, 2015 memorandum, a copy of which is attached hereto as Exhibit A and incorporated as if the same were set forth fully herein with the exception of the following:

Provision: Non-irrigation season canal recharge diversions shall be limited to 10,000 acre-feet. If canal recharge diversions exceed 10,000 acre-feet, the method established for irrigation season canal diversions shall apply.

Approved by the Republican River compact Administration this 27th day of August, 2015.

Gordon W. Fassett, P.E.
Nebraska Member

Date

David Barfield, P.E.
Kansas Member

Date

Dick Wolfe, P.E.
Colorado Member

Date



COLORADO
Division of Water Resources
Department of Natural Resources

1313 Sherman Street, Room 821
Denver, CO 80203

February 24, 2016

Bob Swanson, Director
USGS Nebraska Water Science Center
5231 South 19th Street
Lincoln, NE 68512

Dear Mr. Swanson:

In order to administer the Republican River Compact (Compact), Nebraska, Colorado, and Kansas (the States) must annually exchange and analyze hydrologic data from throughout the Republican River Basin. By April 15 each year, the States exchange data from the previous calendar year. However, the States are often unable to finalize the analyses on-time because USGS has not finalized the data from the stream gages in the basin.

The Republican River Compact Administration (RRCA) appreciates the high-quality data and service that is provided by the USGS. However, the RRCA feels that the USGS could better support Compact accounting efforts in two key ways and therefore requests: First, that preliminary data from USGS stream gages in the Republican River Basin be worked and finalized on a monthly basis to assist ongoing compliance forecasting the States are performing throughout the year. And second, that the USGS finalize all stream gage records for the Basin at the end of each calendar year and make that information available to the Compact Administration by April 1 of each year.

Given the specific responsibilities of the USGS outlined in Article IX of the Republican River Compact to collect and publish these necessary data, we ask that you please consider these requests and let us know whether you believe they are feasible. The RRCA would be happy to further elaborate or answer any questions you might have regarding this request.

Sincerely,

Dick Wolfe, P.E.
Director/State Engineer
Chairman RRCA

Cc: Director, Nebraska Department of Natural Resources
Chief Engineer, Kansas Division of Water Resources





United States Department of the Interior

U.S. GEOLOGICAL SURVEY
Water Resources Discipline
Nebraska Water Science Center
5231 South 19th Street
Lincoln, NE 68512-1271

RECEIVED

APR 18 2016

WATER RESOURCES
STATE ENGINEER
COLO

April 13, 2016

Dick Wolfe, Director/State Engineer
Colorado Division of Water Resources
1313 Sherman Street, Room 821
Denver, CO 80203

Dear Mr. Wolfe:

Thank you for your patience in waiting for the response to your letter of February 24, 2016 regarding requested changes to operation of streamgages that supporting the Republican River Compact Administration (RRCA). Jason Lambrecht (Data Chief, USGS Nebraska Water Science Center (NEWSC)) has been actively pursuing further verification of the requests, which follow:

Request 1: "...preliminary data from USGS stream gages in the Republican River Basin be worked and finalized on a monthly basis to assist ongoing compliance forecasting the States are performing throughout the year."

Request 2: "...the USGS finalize all stream gage records for the Basin at the end of each calendar year and make that information available to the Compact Administration by April 1 of each year."

Because the USGS had further questions regarding this, a phone conference was held on April 6, 2016, with Ivan Franco, Willem Schreuder, Brian Loving (Data Chief, USGS Kansas Water Science Center), Jason Lambrecht, and John Miller (North Platte Field Office Chief, USGS NEWSC) to further discuss the requests.

Discussion during the call regarding Request 1 verified that the RRCA did not require finalized (approved) daily data on a monthly basis, and preliminary (provisional) data was acceptable so long as the data on the NWIS webpage was complete and not missing any daily discharge record. Mr. Schreuder said that the main issue for the RRCA was trying to make monthly projections the USGS records didn't display estimated discharge during periods of backwater from ice (October to December).

Mr. Miller and Mr. Loving assured Mr. Schreuder that the USGS can maintain full record for the 15 Compact streamgages. Also, it was agreed that the RRCA would contact Mr. Miller regarding questions pertaining to the 13 Nebraska streamgages, or Nathan Sullivan (USGS Hays Field Office Chief) pertaining to the two Kansas streamgages.

The USGS will comply with Request 2 and provide finalized (approved) daily streamflow information for the previous calendar year (January 1 to December 31) by April 1 of the following year. Data for both requests will be available through USGS NWISWeb. Mr. Schreuder

said that the RRCA would obtain the data from the USGS NWISWeb and did not require the data to be sent to the RRCA in any other format.

Please feel free to contact me directly, if you have further questions on these two requests.

Sincerely,



Robert B. Swanson

Director, USGS Nebraska Water Science Center

Copy to: Andrew Ziegler
John Miller
Brian Loving



COLORADO
Division of Water Resources
Department of Natural Resources

1313 Sherman Street, Room 821
Denver, CO 80203

May 16, 2016

Bob Swanson, Director
USGS Nebraska Water Science Center
5231 South 19th Street
Lincoln, NE 68512

Dear Mr. Swanson:

This office has received your letter dated April 13, 2016, and the Republican River Compact Administration (RRCA) would like to thank the U.S. Geological Survey (USGS) for working with staff to accommodate the two requests for changes in the way the USGS provides stream gage data to the RRCA. The summary of events outlined in your letter serves as an accurate record of the understanding reached by the USGS and RRCA.

The RRCA looks forward to utilizing the complete record of preliminary gage data, without gaps in daily discharge due to icing, etc., on a monthly basis. As a point of clarification, the RRCA will look for this complete (preliminary) record by the 5th of each month on USGS NWISWeb. Furthermore, the USGS's willingness to provide finalized stream gage records for the entire basin at the end of each calendar year, and make that information available through USGS NWISWeb by April 1st of each year, will be of great value in producing timely RRCA accounting.

The RRCA looks forward to continued work and collaboration with the USGS in administering the Republican River Compact. Should you have any further questions or comments please feel free to contact me directly.

Sincerely,

Dick Wolfe, P.E.
Director/State Engineer
Chairman RRCA

Cc: Director, Nebraska Department of Natural Resources
Chief Engineer, Kansas Division of Water Resources



NDNR's Approach to Estimate Non-Federal Reservoirs Evaporation for RRCA Accounting

Amy Zoller

November 13, 2015

For the purposes of RRCA accounting, the net evaporation from non-federal reservoirs within the boundaries of Nebraska's portion of the Republican River Basin is estimated once a year. As the compact specifies, the estimates should be based on the presumptive average annual surface area of the non-federal reservoirs, as well as the calculated net evaporation from the nearest climate and evaporation station to the reservoir. The state may provide actual data in lieu of the presumptive criteria.

For several years, the state of Nebraska's Department of Natural Resources (NDNR) estimated presumptive annual surface area by interpreting the physical extent of reservoirs using Farm Service Agency (FSA) aerial imagery. The imagery showed the extent of reservoir surface area at a fine (1m)² or (2m)² cell resolution during the growing season for most years. FSA has only contracted to acquire imagery every three years, but because the aerial imagery is in a high demand by multiple agencies, the FSA is often able to obtain additional funds and can fill in certain years. As such, there were only a couple of years (2008 and 2011) that imagery was not available. In these cases, NDNR used the previous year's imagery to estimate average annual surface area. This was considered the best available data, as actual surveys of reservoirs do not exist for small water bodies that do not require a surface water permit or a dam safety plan.

In 2009 and 2012, the Natural Resources Conservation District acquired LiDAR (Light detection and Ranging) digital elevation data (DEMs) that together covered nearly all of the extent of the Republican River Basin within the boundaries of Nebraska. The NDNR IT and dam safety sections performed tests on the LiDAR data with respect to known reservoir volumes and areas, and ultimately developed a program that could use the LiDAR data to estimate reservoir volume and surface area for those reservoirs that had not been physically surveyed. The estimated volumes and surface areas were linked to GIS point data layers (i.e. Nebraska inventory of dams) that represent the intersection of the dam and the outflow stream, for water bodies across the state.

The refined Nebraska dams GIS dataset has enabled NDNR to improve their method of estimating net evaporation for compact accounting purposes. The updated Nebraska dams GIS dataset has completely populated attributes that show Normal Surface Area (principle spillway) and Normal Storage Volume of each reservoir, based off of actual surveys, where available, or from calculations derived from LiDAR analysis/processing as discussed above. NDNR's dam safety section updates the dataset annually on a rotating basis across basins. As such, the number of non-federal reservoirs that NDNR includes in compact accounting may vary slightly year to year due to updates to the database (e.g. some reservoirs do not hold water anymore, or recon shows a previously undetected reservoir, etc.). To summarize, the general approach that NDNR currently implements to estimate net evaporation from non-federal reservoirs follows:

1. Query the Nebraska dams GIS dataset for reservoirs that have a normal storage capacity of 15 AF or greater, but less than 200 AF.
2. Calculate the presumptive average annual surface area as $0.25 * \text{the surface area at the principle surface area}$, interpreted as “normal surface area” in Nebraska inventory of dams (presumptive criteria specified in the compact).
3. Use climate and pan evaporation measurements from the nearest Federal reservoir to estimate net evaporation.
4. Multiply the net evaporation from the nearest Federal reservoir by the presumptive average annual surface area on non-federal reservoirs to estimate net evaporation from these small water bodies
5. For reservoirs 200AF or greater, NDNR field staff perform on-site check(s) of the reservoirs during the year, and report their observations on how reservoir storage. For these larger reservoirs, the presumptive criteria is “full at the principle spillway”, so calculations are performed in the same way as #3-5, but assuming these are full, unless field staff have noted they are empty or only partially full.
6. Summarize net-evaporation estimates for all non-federal reservoirs by sub-basin for accounting purposes.

This is a general description of the methods that NDNR uses to calculate net evaporation from non-federal reservoirs. NDNR is committed to using the best available science, methods and data for compact accounting. If further information is needed please do not hesitate to contact me. Thank you.

Amy L. Zoller, MS
Integrated Water Management Coordinator
State of Nebraska
Department of Natural Resources
301 Centennial Mall South
P.O. Box 94676
Lincoln, NE 68509-4676
Office: [\(402\) 471-0625](tel:4024710625)
amy.zoller@nebraska.gov

RESOLUTION OF THE REPUBLICAN RIVER COMPACT ADMINISTRATION

REGARDING REQUIRED CHANGES TO THE RRCA ACCOUNTING PROCEDURES AND REPORTING REQUIREMENTS REGARDING NON-IRRIGATION SEASON CANAL DIVERSIONS FOR GROUNDWATER RECHARGE PURPOSES

Whereas, the States of Kansas, Nebraska, and Colorado entered into a Final Settlement Stipulation (“FSS”) as of December 15, 2002, to resolve pending litigation in the United States Supreme Court regarding the Republican River Compact (“Compact”) in the case of *Kansas v. Nebraska and Colorado*, no. 126 Original;

Whereas, the FSS was approved by the United States Supreme Court on May 19, 2003;

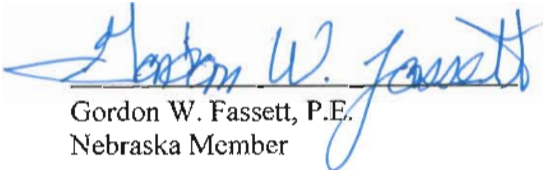
Whereas, by memorandum dated July 7, 2016 and provided at the quarterly RRCA Engineering Committee Meeting on that same date, the state of Nebraska introduced the reformed RRCA Accounting Procedures and Reporting Requirements regarding non-irrigation season canal recharge diversions and the estimated percent loss assigned to those diversions.

Whereas, the proposed changes to the RRCA Accounting Procedures and Reporting Requirements shall be enacted for the accounting years 2016 and forward.

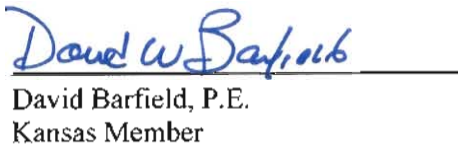
NOW THEREFORE BE IT RESOLVED, the Republican River Compact Administration approves and adopts the proposal set forth in Nebraska’s July 7, 2016 memorandum, a copy of which is attached hereto as Exhibit A and incorporated as if the same were set forth fully herein with the exception of the following:


Provision: Non-irrigation season canal recharge diversions shall be limited to 10,000 acre-feet. If canal recharge diversions exceed 10,000 acre-feet, the method established for irrigation season canal diversions shall apply.

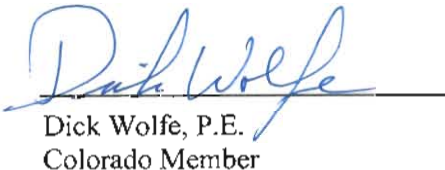
Approved by the Republican River compact Administration this 24th day of August, 2016.

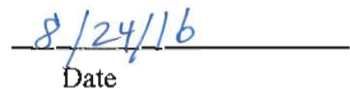

Gordon W. Fassett, P.E.
Nebraska Member


Date


David Barfield, P.E.
Kansas Member


Date


Dick Wolfe, P.E.
Colorado Member


Date

Rules and Regulations

Republican River Compact Administration

Revised August 24, 2016

1. Pursuant to Article IX of the Republican River Compact ("Compact"), the States of Colorado, Nebraska and Kansas have the duty to administer the Compact through the officials in such States who are now or may hereafter be charged with the duty of administering the public water supplies in each of such States. Such officials shall be the members of an administrative body hereby designated as the Republican River Compact Administration ("RRCA"). The purpose of the RRCA shall be to administer the Compact. Such administration shall include but not be limited to the responsibilities as are assigned to it in the Final Settlement Stipulation dated December 15, 2002, approved by the States of Colorado, Nebraska and Kansas and filed in the case of *Kansas v. Nebraska and Colorado*, No. 126, Original, in the Supreme Court of the United States ("Final Settlement Stipulation").
2. As of the effective date of these Rules and Regulations, the officials who are charged with the duty of administering the public water supplies in each of the three States, and who therefore constitute the Members¹ are the individuals who hold the following offices: the State Engineer of the Division of Water Resources of the Colorado Department of Natural Resources; the Director of Natural Resources for the State of Nebraska; and, the Chief Engineer of the Division of Water Resources of the Kansas Department of Agriculture.
3. Each RRCA Member's term shall run concurrent with his or her term of office as the official charged with administering the public water supplies in his or her State.

¹ Reference in the RRCA records to "Commissioner(s)" refers to the Members as described in these Rules and Regulations.

4. Each State official shall be recognized as a Member of the RRCA upon furnishing to the other Members satisfactory evidence that he or she is the official in his or her State charged with the duty of administering the public water supplies in such State.
5. Any Member of the RRCA may appoint an alternate person to serve in his or her place. In the event any Member is unable to perform his or her official duties, the appointing authority of the State represented by that Member may appoint the Member's alternate to serve in his or her place. Any such alternate shall be recognized as that State's representative to the RRCA upon presentation to the Members from the other States of a written appointment letter signed by the absent Member, or, as applicable, by the appointing authority of the State involved. An appointment of an alternate shall be valid only for the period of the appointment.
6. The Chair of the RRCA shall be a Member of the RRCA. Each Chair shall serve a term encompassing two annual meetings. The Chair's term shall begin upon the conclusion of the last meeting chaired by the previous Chair and shall expire at the conclusion of the second annual meeting at which he or she serves as Chair. Unless otherwise agreed by all Members, the rotation of the Chair shall be by State in the following order beginning at the conclusion of the annual meeting in 2003: Colorado; Kansas; and Nebraska.
7. The Chair, or his or her alternate, shall preside at all meetings of the RRCA. The Chair may initiate or second motions and vote on all matters coming before the RRCA. The Chair shall issue notice of all meetings to all members as to the time, place, and agenda of the meeting at least 15 days in advance of any regular meeting, unless otherwise agreed by the Members, and as soon as possible prior to any special meeting. Any issue to be raised for dispute resolution at a regular meeting pursuant to paragraph 15 of these Rules and Regulations shall be distributed to the members at least 30 days in advance of the regular meeting. The agenda shall include all items for which a Member makes a timely request for inclusion on the agenda. The Chair or

other person designated by the RRCA shall also keep a record of the proceedings, including official meeting minutes, of all meetings and of all transactions of the RRCA during his or her term of office. The record of proceedings shall include: minutes; Annual Report; reports required by the Final Settlement Stipulation; committee and subcommittee reports; the data, computations and results required in the Accounting Procedures; and such other matters as deemed appropriate by the RRCA. Meeting minutes will not be official until approved by the RRCA. Unless otherwise agreed to by all Members of the RRCA, the Chair shall be responsible for the preparation of an electronic recording of each meeting, unless any Member requests in advance a transcript of each meeting. The Chair will be responsible for providing a copy of the record of proceedings for that year. The RRCA, through the Chair, will maintain an official repository of records of the proceedings.

8. The RRCA hereby creates a standing Engineering Committee that shall be composed of one representative from each State appointed by the RRCA Member from that State. The RRCA may create other standing, ad hoc or special committees composed of members of the RRCA and/or other persons appointed by the Members. The RRCA may assign to such committees any tasks that it determines to be appropriate.
9. The RRCA shall hold a regular annual meeting prior to September 1st each year. However, the Chair may waive an annual meeting, or hold the meeting at a later date, upon unanimous written consent of the Members. The annual meeting shall be held at a location in the Chair's State at a time and place acceptable to the other members.
10. The RRCA shall hold a special meeting, other than a meeting to address a "fast track issue" as provided for in the Section VII of the Final Settlement Stipulation, upon written request of any Member and with the concurrence of the other two Members. The Chair of the RRCA shall poll all of the Members prior to setting the meeting date, time, and place of a specially scheduled

meeting. All Members shall make a good faith effort to arrange a mutually agreeable date, time, and place for all meetings.

11. A quorum for a RRCA meeting shall be present only when all of the Members or their duly appointed alternates are in attendance. The RRCA may act only by unanimous vote of all members or duly appointed alternates. Each State shall have one vote. The Chair shall document each action of the RRCA by formal written resolution or such action shall be recorded in the approved minutes. The RRCA shall honor a request by any Member or duly appointed alternate that action on any matter be by formal resolution.
12. The RRCA shall prepare and approve an annual report that includes the official actions taken by the RRCA at the annual meeting and at any special meetings, a summary of the compact accounting for the previous year and such other matters as the RRCA may deem appropriate. The Chair shall furnish copies of the report to the President of the United States, the Governors of the States of Colorado, Nebraska and Kansas, the officials of appropriate State and federal agencies and to any other person, as the RRCA determines appropriate.
13. The RRCA may make amendments, revisions, deletions, or additions to these Rules and Regulations at any meeting of the RRCA. Unless otherwise agreed to by the RRCA, written notice and a copy of any proposed change must be sent to all Members by the Member proposing the change at least 15 days in advance of any meeting at which the RRCA shall consider such changes. Any Member may offer modifications of any such proposed changes at any time prior to the RRCA acting on those proposed changes.
14. Compact accounting and data exchanges among the States shall be done annually in accordance with the Final Settlement Stipulation, including the RRCA Accounting Procedures and Reporting Requirements, dated August 24, 2016, and the Republican River Compact Administration Groundwater Model, Version 12s2 (V12s2), dated August 6, 2010. Unless otherwise agreed to

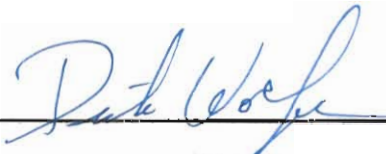
by the RRCA Members, the annual accounting shall be completed by the Engineering Committee and submitted to the RRCA no later than June 1st of the year following for which the accounting is being done. The RRCA may modify the RRCA Accounting Procedures and the RRCA Groundwater model only by contemporaneously amending these Rules and Regulations to show the date, title or version, as appropriate, of the RRCA Accounting Procedures and/or the RRCA Groundwater model that the RRCA shall use. At the time of any modification, the RRCA shall specify the time and method for implementation of each modification.

15. Any dispute arising among the States shall be resolved in accordance with the procedures set forth in Article VII of the Final Settlement Stipulation.

Adopted by the Republican River Compact Administration this 24th day of August, 2016.



David W. Barfield
Commissioner for Kansas



Dick Wolfe
Commissioner for Colorado



Gordon W. Fassett
Commissioner for Nebraska

DATE: July 7, 2016

TO: Jennifer Schellpeper

FROM: Kari Burgert

SUBJECT: Proposed Changes to the RRCA Accounting Procedures Documentation Regarding Attachment 7 of the August 27, 2015, RRCA Accounting Procedures and Reporting Requirements Document

Executive Summary

The purpose of this Memorandum is to provide documentation of the August 2015 RRCA Accounting Procedures and Reporting Requirements edited to suggest changes to non-irrigation season accounting and Attachment 7 in the document.

Proposed changes to Attachment 7 include editing the spreadsheet to adjust for the Estimated Percent Loss for Column 10 of the original attachment to 92% for diversion which take place during the Non-Irrigation period (October-April).

The following sections provide justification for the proposed changes to the RRCA Accounting Procedures documentation. For the proposed changes, editing the table to adjust for the Percent Field and Canal Loss That Returns to the Stream will result in additions to the specific formulas for each sub-basin and the main stem.

Attachment A of this Memorandum provides an example from the year 2009 using the proposed changes to Attachment 7. Attachment B contains the edited Republican River Compact Administration Accounting Procedures and Reporting Requirements (August 2015) with proposed changes for editing Attachment 7 for Percent Field and Canal Loss that Returns to Stream for the Non-Irrigation Season. Attachment C contains a draft resolution regarding the herein proposed edits.

Edits to Attachment 7 Regarding Column 10, “Percent Field and Canal Loss That Returns to the Stream”

In a previous Memorandum entitled “Documentation of Procedures Producing Charts Depicting Net Evaporation, with Executive Summary of Comparisons between Irrigation and Non-Irrigation Seasons or Months for Reservoirs along the Republican River” and summarized in the Memorandum entitled “Changes to the RRCA Accounting Procedures Documentation Including those Ordered by the U.S. Supreme Court and those Regarding Attachment 7 of the August 12, 2010 RRCA Accounting Procedures and Reporting Requirements Document,” it was determined that during the Irrigation Season (May-September), much greater amounts of water are annually lost to evaporative effects than during the Non-

Irrigation Season (October-April). On an annual basis, an average ratio of Irrigation Season Evaporation to Non-Irrigation Season Evaporation was determined to be 70/30 after analyzing data for the 10-year period from 2004-2013.

Given that the current evaporation rate of 18% (Percent Field and Canal Loss That Returns to the Stream = 82%) applied in Column 10 of Attachment 7 of the RRCA Accounting Procedures document is a seasonal value normally used for diversion during the Irrigation season and that the ratio of Irrigation Season to Non-Irrigation Season is equal to 70/30, the following derivation can be implied to determine an appropriate value for the evaporation rate (1-Percent Field and Canal Loss That Returns to the Stream) during the Non-Irrigation Seasons.

Derivation of Non-Irrigation Season Evaporation Rate:

X = Irrigation Season Evaporation Rate (18%)

Y = Non-Irrigation Season Evaporation Rate (___%)

70/30 = Ratio of Irrigation Season to Non-Irrigation Season Evaporation Rates

Where,

$X/Y = 70/30$

And

$Y = X / (70/30)$

Therefore,

$Y = 0.18/(70/30)$

And simplifying,

Y = 0.077

From this derivation, it can be implied then that if Column 10 of Attachment 7 = 82% (1-0.18) for the Irrigation Season, Column 10 of Attachment 7 would then equal 92% (1-0.077) for the Non-Irrigation Season.

Calculations for each canal must then be broken down according to Irrigation Season diversions and Non-Irrigation Season diversion. For Non-Irrigation Season calculations, Column 5 “Field Deliveries” will always be zero, since water is not diverted for field use. As shown in the following example in Attachment B for the year 2009, we will assume a Canal Diversion value of 100 Ac-ft. SWW of 0 Ac-ft., Field Deliveries of 0 Ac-ft., and an Average Field Loss factor of (30%).

Because Column 5 is equal to zero, Column 6 “Canal Loss” will be equal to the original diversion amount minus Column 3 “Spill to Waste-way (SWW)”, and Column 8 “Field Loss” will be zero. Therefore, Column 9 “Total Loss from District” will be equal to the original diversion amount minus Column 3 “SWW”.

Then, Column 11 “Total Return to Stream from Canal and Field Loss” is equal to Column 9 “Total Loss from District” multiplied by the value present in Column 10 (92%) plus Column 3 “SWW.”

Finally, it is then implied that Column 12 “Return as Percent of Canal Diversion” (%BRF) will be equal to the Column 11 value divided by the original diversion amount. %BRF, or Percent of Diversion from Bureau Canals that returns to the Stream (Column 12), is the only value from Attachment 7 which is represented in §IV.B of the RRCA Accounting Procedures document. Therefore, the changes to Attachment 7 must be reflected when calculating the specific formulas for each sub-basin and the main stem. Edits to the formulas must be made to implement this data into the accounting process.

The following example formula from §IV.B #8 of the RRCA Accounting Procedures document for Frenchman Creek in Nebraska depicts the necessary formula additions need to calculate CBCU Nebraska.

$$\text{CBCU Nebraska} = \text{Culbertson Canal Diversion (IRR Season)} \times (1 - \% \text{BRF}) + \text{Culbertson Canal Diversions (Non-IRR Season)} \times (1 - 92\%) + \text{Culbertson Extension (IRR Season)} \times (1 - \% \text{BRF}) + \text{Culbertson Extension (Non-IRR Season)} \times (1 - 92\%) + 0.6 \times \text{Champion Canal Diversion} + 0.6 \times \text{Riverside Canal Diversion} + 0.6 \times \text{Dn} + \% \times \text{Pn} + 0.5 \times \text{M\&In} + \text{EvNFRn} + \text{Enders Reservoir Ev} + \text{GWn}$$

This correction should be applied to all CBCU Nebraska calculations for Sub-Basins and Main-Stem in §IV.B of the RRCA Accounting Procedures document.

A copy of the RRCA Accounting Procedures and Reporting Requirements (August 2015) document containing the proposed changes for editing Attachment 7 for Percent Field and Canal Loss that Returns to Stream for the Non-Irrigation Season can be found in Attachment B.

Conclusions and Final Documentation

Attachment A of this Memorandum provides an example from the year 2009 using the proposed changes to Attachment 7. Attachment B contains the edited Republican River Compact Administration Accounting Procedures and Reporting Requirements (August 2015) with proposed changes for editing Attachment 7 for Percent Field and Canal Loss that Returns to Stream for the Non-Irrigation Season. Attachment C contains a draft resolution regarding the herein proposed edits.

Attachment A

Attachment 7: Calculations of Return Flows from Bureau of Reclamation Canals

Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8	Col 9	Col 10	Col 11	Col 12
Canal	Canal Diversion	Spill to Waste-way	Net Diversion	Field Deliveries	Canal Loss	Average Field Loss Factor	Field Loss	Total Loss from District	Percent field and Canal Loss That Returns to the Stream	Total return to Stream from Canal and Field Loss	Return as Percent of Canal Diversion
Name Canal	Headgate Diversion	Sum of measured spills to river	Col 2 - Col 3	Sum of deliveries to the field	Col 4 – Col 5	1 – Weighted Average Efficiency of Application System for the District*	Col 5 x Col 7	Col 6 + Col 8	Estimated Percent Loss*	Col 9 x Col 10 + Col 3	Col 11 / Col 2
∑ Irrigation Season											
∑ Non-Irrigation Season											
Example	100	5	95	60	35	30%	18	53	82%	48	48%
	100	5	95	0	95	30%	0	95	92%	87.4	87%
Culbertson						30%			82%		
						30%			92%		
Culbertson Extension						30%			82%		
						30%			92%		
Meeker - Driftwood	23,274		23,274	5,603	17,671	30%	1,681	19,352	82%	15,869	68%
	3,491	0	3,491	0	3,491	30%	0	3,491	92%	3,212	92%
Red Willow						30%			82%		
						30%			92%		
Bartley						30%			82%		
						30%			92%		
Cambridge						30%			82%		
						30%			92%		
Naponee						35%			82%		
						35%			92%		
Franklin						35%			82%		
						35%			92%		
Franklin Pump						35%			82%		
						35%			92%		
Almena						30%			82%		
Superior						31%			82%		
						31%			92%		
Nebraska Courtland						23%			82%		
Courtland Canal Above Lovewell (KS)						23%			82%		
Courtland Canal Below Lovewell						23%			82%		

*The average field efficiencies for each district and percent loss that returns to the stream may be reviewed and, if necessary, changed by the RRCA to improve the accuracy of the estimates.

Republican River Compact Administration

ACCOUNTING PROCEDURES AND REPORTING REQUIREMENTS

Revised August 27, 2015

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Introduction

This document describes the definitions, procedures, basic formulas, specific formulas, and data requirements and reporting formats to be used by the RRCA to compute the Virgin Water Supply, Computed Water Supply, Allocations, Imported Water Supply Credit and Computed Beneficial Consumptive Use. These computations shall be used to determine supply, allocations, use and compliance with the Compact according to the Stipulation. These definitions, procedures, basic and specific formulas, data requirements and attachments may be changed by consent of the RRCA consistent with Subsection I.F of the Stipulation. This document will be referred to as the RRCA Accounting Procedures. Attached to these RRCA Accounting Procedures as Figure 1 is the map attached to the Compact that shows the Basin, its streams and the Basin boundaries.

II. Definitions

The following words and phrases as used in these RRCA Accounting Procedures are defined as follows:

Additional Water Administration Year - a year when the projected or actual irrigation water supply is less than 130,000 Acre-feet of storage available for use from Harlan County Lake as determined by the Bureau of Reclamation using the methodology described in the Harlan County Lake Operation Consensus Plan attached as Appendix K to the Stipulation.

Allocation(s): the water supply allocated to each State from the Computed Water Supply;

Annual: yearly from January 1 through December 31;

Basin: the Republican River Basin as defined in Article II of the Compact;

Beneficial Consumptive Use: that use by which the Water Supply of the Basin is consumed through the activities of man, and shall include water consumed by evaporation from any reservoir, canal, ditch, or irrigated area;

Change in Federal Reservoir Storage: the difference between the amount of water in storage in the reservoir on December 31 of each year and the amount of water in storage on December 31 of the previous year. The current area capacity table supplied by the appropriate federal operating agency shall be used to determine the contents of the reservoir on each date;

Compact: the Republican River Compact, Act of February 22, 1943, 1943 Kan. Sess. Laws 612, codified at Kan. Stat. Ann. § 82a-518 (1997); Act of February 24, 1943, 1943 Neb. Laws 377, codified at 2A Neb. Rev. Stat. App. § 1-106 (1995), Act of March 15, 1943, 1943 Colo. Sess. Laws 362, codified at Colo. Rev. Stat. §§ 37-67-101 and 37-67-102 (2001); Republican River Compact, Act of May 26, 1943, ch. 104, 57 Stat. 86;

Computed Beneficial Consumptive Use: for purposes of Compact accounting, the stream flow depletion resulting from the following activities of man:

- Irrigation of lands in excess of two acres;
- Any non-irrigation diversion of more than 50 Acre-feet per year;
- Multiple diversions of 50 Acre-feet or less that are connected or otherwise combined to serve a single project will be considered as a single diversion for accounting purposes if they total more than 50 Acre-feet;
- Net evaporation from Federal Reservoirs;
- Net evaporation from Non-federal Reservoirs within the surface boundaries of the Basin;
- Any other activities that may be included by amendment of these formulas by the RRCA;

Computed Water Supply: the Virgin Water Supply less the Change in Federal Reservoir Storage in any Designated Drainage Basin, and less the Flood Flows;

Designated Drainage Basins: the drainage basins of the specific tributaries and the Main Stem of the Republican River as described in Article III of the Compact. Attached hereto as Figure 3 is a map of the Sub-basins and Main Stem;

Dewatering Well: a Well constructed solely for the purpose of lowering the groundwater elevation;

Federal Reservoirs:

- Bonny Reservoir
- Swanson Lake
- Enders Reservoir
- Hugh Butler Lake
- Harry Strunk Lake
- Keith Sebelius Lake
- Harlan County Lake
- Lovewell Reservoir

Flood Flows: the amount of water deducted from the Virgin Water Supply as part of the computation of the Computed Water Supply due to a flood event as determined by the methodology described in Subsection III.B.1.;

Gaged Flow: the measured flow at the designated stream gage;

Guide Rock: a point at the Superior-Courtland Diversion Dam on the Republican River near Guide Rock, Nebraska; the Superior-Courtland Diversion Dam gage plus any flows through the sluice gates of the dam, specifically excluding any diversions to the Superior and Courtland Canals, shall be the measure of flows at Guide Rock;

Historic Consumptive Use: that amount of water that has been consumed under appropriate and reasonably efficient practices to accomplish without waste the purposes for which the appropriation or other legally permitted use was lawfully made;

Imported Water Supply: the water supply imported by a State from outside the Basin resulting from the activities of man;

Imported Water Supply Credit: the accretions to stream flow due to water imports from outside of the Basin as computed by the RRCA Groundwater Model. The Imported Water Supply Credit of a State shall not be included in the Virgin Water Supply and shall be counted as a credit/offset against the Computed Beneficial Consumptive Use of water allocated to that State, except as provided in Subsection V.B.2. of the Stipulation and Subsections III.I. – J. of these RRCA Accounting Procedures;

Main Stem: the Designated Drainage Basin identified in Article III of the Compact as the North Fork of the Republican River in Nebraska and the main stem of the Republican River between the junction of the North Fork and the Arikaree River and the lowest crossing of the river at the Nebraska-Kansas state line and the small tributaries thereof, and also including the drainage basin Blackwood Creek;

Main Stem Allocation: the portion of the Computed Water Supply derived from the Main Stem and the Unallocated Supply derived from the Sub-basins as shared by Kansas and Nebraska;

Meeting(s): a meeting of the RRCA, including any regularly scheduled annual meeting or any special meeting;

Modeling Committee: the modeling committee established in Subsection IV.C. of the Stipulation;

Moratorium: the prohibition and limitations on construction of new Wells in the geographic area described in Section III. of the Stipulation;

Non-federal Reservoirs: reservoirs other than Federal Reservoirs that have a storage capacity of 15 Acre-feet or greater at the principal spillway elevation;

Northwest Kansas: those portions of the Sub-basins within Kansas;

Replacement Well: a Well that replaces an existing Well that a) will not be used after construction of the new Well and b) will be abandoned within one year after such construction or is used in a manner that is excepted from the Moratorium pursuant to Subsections III.B.1.c.-f. of the Stipulation;

RRCA: Republican River Compact Administration, the administrative body composed of the State officials identified in Article IX of the Compact;

RRCA Accounting Procedures: this document and all attachments hereto;

RRCA Groundwater Model: the groundwater model developed under the provisions of Subsection IV.C. of the Stipulation and as subsequently adopted and revised through action of the RRCA;

State: any of the States of Colorado, Kansas, and Nebraska;

States: the States of Colorado, Kansas and Nebraska;

Stipulation: the Final Settlement Stipulation to be filed in *Kansas v. Nebraska and Colorado*, No. 126, Original, including all Appendices attached thereto;

Sub-basin: the Designated Drainage Basins, except for the Main Stem, identified in Article III of the Compact. For purposes of Compact accounting the following Sub-basins will be defined as described below:

North Fork of the Republican River in Colorado drainage basin is that drainage area above USGS gaging station number 06823000, North Fork Republican River at the Colorado-Nebraska State Line,

Arikaree River drainage basin is that drainage area above USGS gaging station number 06821500, Arikaree River at Haigler, Nebraska,

Buffalo Creek drainage basin is that drainage area above USGS gaging station number 06823500, Buffalo Creek near Haigler, Nebraska,

Rock Creek drainage basin is that drainage area above USGS gaging station number 06824000, Rock Creek at Parks, Nebraska,

South Fork of the Republican River drainage basin is that drainage area above USGS gaging station number 06827500, South Fork Republican River near Benkelman, Nebraska,

Frenchman Creek (River) drainage basin in Nebraska is that drainage area above USGS gaging station number 06835500, Frenchman Creek in Culbertson, Nebraska,

Driftwood Creek drainage basin is that drainage area above USGS gaging station number 06836500, Driftwood Creek near McCook, Nebraska,

Red Willow Creek drainage basin is that drainage area above USGS gaging station number 06838000, Red Willow Creek near Red Willow, Nebraska,

Medicine Creek drainage basin is that drainage area above the Medicine Creek below Harry Strunk Lake, State of Nebraska gaging station number 06842500; and the drainage area between the gage and the confluence with the Main Stem,

Sappa Creek drainage basin is that drainage area above USGS gaging station number 06847500, Sappa Creek near Stamford, Nebraska and the drainage area between the gage and the confluence with the Main Stem; and excluding the Beaver Creek drainage basin area downstream from the State of Nebraska gaging station number 06847000 Beaver Creek near Beaver City, Nebraska to the confluence with Sappa Creek,

Beaver Creek drainage basin is that drainage area above State of Nebraska gaging station number 06847000, Beaver Creek near Beaver City, Nebraska, and the drainage area between the gage and the confluence with Sappa Creek,

Prairie Dog Creek drainage basin is that drainage area above USGS gaging station number 06848500, Prairie Dog Creek near Woodruff, Kansas, and the drainage area between the gage and the confluence with the Main Stem;

Attached hereto as Figure 2 is a line diagram depicting the streams, Federal Reservoirs and gaging stations;

Test hole: a hole designed solely for the purpose of obtaining information on hydrologic and/or geologic conditions;

Trenton Dam: a dam located at 40 degrees, 10 minutes, 10 seconds latitude and 101 degrees, 3 minutes, 35 seconds longitude, approximately two and one-half miles west of the town of Trenton, Nebraska;

Unallocated Supply: the “water supplies of upstream basins otherwise unallocated” as set forth in Article IV of the Compact;

Upstream of Guide Rock, Nebraska: those areas within the Basin lying west of a line proceeding north from the Nebraska-Kansas state line and following the western edge of Webster County, Township 1, Range 9, Sections 34, 27, 22, 15, 10 and 3 through Webster County, Township 2, Range 9, Sections 34, 27 and 22; then proceeding west along the southern edge of Webster County, Township 2, Range 9, Sections 16, 17 and 18; then proceeding north following the western edge of Webster County, Township 2, Range 9, Sections 18, 7 and 6, through Webster County, Township 3, Range 9, Sections 31, 30, 19, 18, 7 and 6 to its intersection with the northern boundary of Webster County. Upstream of Guide Rock, Nebraska shall not include that area in Kansas east of the 99° meridian and south of the Kansas-Nebraska state line;

Virgin Water Supply: the Water Supply within the Basin undepleted by the activities of man;

Water Short Year Administration: administration in a year when the projected or actual irrigation water supply is less than 119,000 acre feet of storage available for use from Harlan County Lake as determined by the Bureau of Reclamation using the methodology described in the Harlan County Lake Operation Consensus Plan attached as Appendix K to the Stipulation.

Water Supply of the Basin or Water Supply within the Basin: the stream flows within the Basin, excluding Imported Water Supply;

Well: any structure, device or excavation for the purpose or with the effect of obtaining groundwater for beneficial use from an aquifer, including wells, water wells, or groundwater wells as further defined and used in each State’s laws, rules, and regulations.

III. Basic Formulas

The basic formulas for calculating Virgin Water Supply, Computed Water Supply, Imported Water Supply, Allocations and Computed Beneficial Consumptive Use are set forth below. The results of these calculations shall be shown in a table format as shown in Table 1.

Basic Formulas for Calculating Virgin Water Supply, Computed Water Supply, Allocations and Computed Beneficial Consumptive Use	
Sub-basin VWS	= Gage + All CBCU + ΔS – IWS
Main Stem VWS	= Hardy Gage – Σ Sub-basin gages + All CBCU in the Main Stem + ΔS – IWS
CWS	= VWS - Δ S – FF
Allocation for each State in each Sub-basin And Main Stem	= CWS x %
State's Allocation	= Σ Allocations for Each State
State's CBCU	= Σ State's CBCUs in each Sub-basin and Main Stem

Abbreviations:

- CBCU = Computed Beneficial Consumptive Use
- FF = Flood Flows
- Gage = Gaged Flow
- IWS = Imported Water Supply Credit
- CWS = Computed Water Supply
- VWS = Virgin Water Supply

% = the ratio used to allocate the Computed Water Supply between the States. This ratio is based on the allocations in the Compact

ΔS = Change in Federal Reservoir Storage

A. Calculation of Annual Virgin Water Supply

1. Sub-basin calculation:

The annual Virgin Water Supply for each Sub-basin will be calculated by adding: a) the annual stream flow in that Sub-basin at the Sub-basin stream gage designated in Section II., b) the annual Computed Beneficial Consumptive Use above that gaging station, and c) the Change in Federal Reservoir Storage in that Sub-basin; and from that total subtract any Imported Water Supply Credit. The Computed Beneficial Consumptive Use will be calculated as described in Subsection III. D. Adjustments for flows diverted around stream gages and for Computed Beneficial Consumptive Uses in the Sub-basin between the Sub-basin stream gage and the confluence of the Sub-basin tributary and the Main Stem shall be made as described in Subsections III. D. 1 and 2 and IV. B.

2. Main Stem Calculation:

The annual Virgin Water Supply for the Main Stem will be calculated by adding: a) the flow at the Hardy gage minus the flows from the Sub-basin gages listed in Section II, b) the annual Computed Beneficial Consumptive Use in the Main Stem, and c) the Change in Federal Reservoir Storage from Swanson Lake and Harlan County Lake; and from that total subtract any Imported Water Supply Credit for the Main Stem. Adjustments for flows diverted around Sub-basin stream gages and for Computed Beneficial Consumptive Uses in a Sub-basin between the Sub-basin stream gage and the confluence of the Sub-basin tributary and the Mains Stem shall be made as described in Subsections III. D. 1 and 2 and IV.B.,

3. Imported Water Supply Credit Calculation:

The amount of Imported Water Supply Credit shall be determined by the RRCA Groundwater Model. The Imported Water Supply Credit of a State shall not be included in the Virgin Water Supply and shall be counted as a credit/offset against the Computed Beneficial Consumptive Use of water allocated to that State. Currently, the Imported Water Supply Credits shall be determined using two runs of the RRCA Groundwater Model:

- a. The “base” run shall be the run with all groundwater pumping, groundwater pumping recharge, and surface water recharge within the model study

boundary for the current accounting year turned “on.”

- b. The “no NE import” run shall be the run with the same model inputs as the base run with the exception that surface water recharge associated with Nebraska’s Imported Water Supply shall be turned “off.” This will be the same “no NE import” run used to determine groundwater Computed Beneficial Consumptive Uses.

The Imported Water Supply Credit shall be the difference in stream flows between these two model runs. Differences in stream flows shall be determined at the same locations as identified in Subsection III.D.1. for the “no pumping” runs. Should another State import water into the Basin in the future, the RRCA will develop a similar procedure to determine Imported Water Supply Credits.

B. Calculation of Computed Water Supply

On any Designated Drainage Basin without a Federal Reservoir, the Computed Water Supply will be equal to the Virgin Water Supply of that Designated Drainage Basin minus Flood Flows.

On any Designated Drainage Basin with a Federal Reservoir, the Computed Water Supply will be equal to the Virgin Water Supply minus the Change in Federal Reservoir Storage in that Designated Drainage Basin and minus Flood Flows.

1. Flood Flows

If in any calendar year there are five consecutive months in which the total actual stream flow¹ at the Hardy gage is greater than 325,000 Acre-feet, or any two consecutive months in which the total actual stream flow is greater than 200,000 Acre-feet, the annual flow in excess of 400,000 Acre-feet at the Hardy gage will be considered to be Flood Flows that will be subtracted from the Virgin Water Supply to calculate the Computed Water Supply, and Allocations. The Flood Flow in excess of 400,000 Acre-feet at the Hardy gage will be subtracted from the Virgin Water Supply of the Main Stem to compute the Computed Water Supply unless the Annual Gaged Flows from a Sub-basin were in excess of the flows shown for that Sub-basin in Attachment 1. These excess Sub-basin flows shall be considered to be Sub-basin Flood Flows.

If there are Sub-basin Flood Flows, the total of all Sub-basin Flood Flows shall be compared to the amount of Flood Flows at the Hardy gage. If the sum of the Sub-basin Flood Flows are in excess of the Flood Flow at the Hardy gage, the flows to

¹ These actual stream flows reflect Gaged Flows after depletions by Beneficial Consumptive Use and change in reservoir storage above the gage.

be deducted from each Sub-basin shall be the product of the Flood Flows for each Sub-basin times the ratio of the Flood Flows at the Hardy gage divided by the sum of the Flood Flows of the Sub-basin gages. If the sum of the Sub-basin Flood Flows is less than the Flood Flow at the Hardy gage, the entire amount of each Sub-basin Flood Flow shall be deducted from the Virgin Water Supply to compute the Computed Water Supply of that Sub-basin for that year. The remainder of the Flood Flows will be subtracted from the flows of the Main Stem.

C. Calculation of Annual Allocations

Article IV of the Compact allocates 54,100 Acre-feet for Beneficial Consumptive Use in Colorado, 190,300 Acre-feet for Beneficial Consumptive Use in Kansas and 234,500 Acre-feet for Beneficial Consumptive Use in Nebraska. The Compact provides that the Compact totals are to be derived from the sources and in the amounts specified in Table 2.

The Allocations derived from each Sub-basin to each State shall be the Computed Water Supply multiplied by the percentages set forth in Table 2. In addition, Kansas shall receive 51.1% of the Main Stem Allocation and the Unallocated Supply and Nebraska shall receive 48.9% of the Main Stem Allocation and the Unallocated Supply.

D. Calculation of Annual Computed Beneficial Consumptive Use

1. Groundwater

Computed Beneficial Consumptive Use of groundwater shall be determined by use of the RRCA Groundwater Model. The Computed Beneficial Consumptive Use of groundwater for each State shall be determined as the difference in streamflows using two runs of the model:

The “no NE import” run shall be the run with all groundwater pumping, groundwater pumping recharge, and surface water recharge within the model study boundary for the current accounting year “on”, with the exception that surface water recharge associated with Nebraska’s Imported Water Supply shall be turned “off.”

The “no State pumping” run shall be the run with the same model inputs as the “no NE import” run with the exception that all groundwater pumping and pumping recharge of that State shall be turned “off.”

An output of the model is baseflows at selected stream cells. Changes in the baseflows predicted by the model between the “no NE import” run and the “no-State- pumping” model run is assumed to be the depletions to streamflows.

i.e., groundwater computed beneficial consumptive use, due to State groundwater pumping at that location. The values for each Sub-basin will include all depletions and accretions upstream of the confluence with the Main Stem. The values for the Main Stem will include all depletions and accretions in stream reaches not otherwise accounted for in a Sub-basin. The values for the Main Stem will be computed separately for the reach above Guide Rock, and the reach below Guide Rock.

2. Surface Water

The Computed Beneficial Consumptive Use of surface water for irrigation and non-irrigation uses shall be computed by taking the diversions from the river and subtracting the return flows to the river resulting from those diversions, as described in Subsections IV.A.2.a.-d. The Computed Beneficial Consumptive Use of surface water from Federal Reservoir and Non-Federal Reservoir evaporation shall be the net reservoir evaporation from the reservoirs, as described in Subsections IV.A.2.e.-f.

For Sub-basins where the gage designated in Section II. is near the confluence with the Main Stem, each State's Sub-basin Computed Beneficial Consumptive Use of surface water shall be the State's Computed Beneficial Consumptive Use of surface water above the Sub-basin gage. For Medicine Creek, Sappa Creek, Beaver Creek and Prairie Dog Creek, where the gage is not near the confluence with the Main Stem, each State's Computed Beneficial Consumptive Use of surface water shall be the sum of the State's Computed Beneficial Consumptive Use of surface water above the gage, and its Computed Beneficial Consumptive Use of surface water between the gage and the confluence with the Main Stem.

E. Calculation to Determine Compact Compliance Using Five-Year Running Averages

Each year, using the procedures described herein, the RRCA will calculate the Annual Allocations by Designated Drainage Basin and total for each State, the Computed Beneficial Consumptive Use by Designated Drainage Basin and total for each State and the Imported Water Supply Credit that a State may use for the preceding year. These results for the current Compact accounting year as well as the results of the previous four accounting years and the five-year average of these results will be displayed in the format shown in Table 3.

F. Calculations To Determine Colorado's and Kansas's Compliance with the Sub-basin Non-Impairment Requirement

The data needed to determine Colorado's and Kansas's compliance with the Sub-basin non-impairment requirement in Subsection IV.B.2. of the Stipulation are shown in Tables 4.A. and B.

G. Calculations To Determine Projected Water Supply

1. Procedures to Determine Water Short Years

The Bureau of Reclamation will provide each of the States with a monthly or, if requested by any one of the States, a more frequent update of the projected or actual irrigation supply from Harlan County Lake for that irrigation season using the methodology described in the Harlan County Lake Operation Consensus Plan, attached as Appendix K to the Stipulation. The steps for the calculation are as follows:

Step 1. At the beginning of the calculation month (1) the total projected inflow for the calculation month and each succeeding month through the end of May shall be added to the previous end of month Harlan County Lake content and (2) the total projected 1993 level evaporation loss for the calculation month and each succeeding month through the end of May shall then be subtracted. The total projected inflow shall be the 1993 level average monthly inflow or the running average monthly inflow for the previous five years, whichever is less.

Step 2. Determine the maximum irrigation water available by subtracting the sediment pool storage (currently 164,111 Acre-feet) and adding the summer sediment pool evaporation (20,000 Acre-feet) to the result from Step 1.

Step 3. For October through January calculations, take the result from Step 2 and using the Shared Shortage Adjustment Table in Attachment 2 hereto, determine the preliminary irrigation water available for release. The calculation using the end of December content (January calculation month) indicates the minimum amount of irrigation water available for release at the end of May. For February through June calculations, subtract the maximum irrigation water available for the January calculation month from the maximum irrigation water available for the calculation month. If the result is negative, the irrigation water available for release (January calculation month) stays the same. If the result is positive the preliminary irrigation

water available for release (January calculation month) is increased by the positive amount.

Step 4. Compare the result from Step 3 to 119,000 Acre-feet. If the result from Step 3 is less than 119,000 Acre-feet Water Short Year Administration is in effect.

Step 5. The final annual Water-Short Year Administration calculation determines the total estimated irrigation supply at the end of June (calculated in July). Use the result from Step 3 for the end of May irrigation release estimate, add the June computed inflow to Harlan County Lake and subtract the June computed gross evaporation loss from Harlan County Lake.

2. Procedures to Determine 130,000 Acre Feet Projected Water Supply

To determine the preliminary irrigation supply for the October through June calculation months, follow the procedure described in steps 1 through 4 of the “Procedures to determine Water Short Years” Subsection III. G. 1. The result from step 4 provides the forecasted water supply, which is compared to 130,000 Acre-feet. For the July through September calculation months, use the previous end of calculation month preliminary irrigation supply, add the previous month’s Harlan County Lake computed inflow and subtract the previous month’s computed gross evaporation loss from Harlan County Lake to determine the current preliminary irrigation supply. The result is compared to 130,000 Acre-feet.

H. Calculation of Computed Water Supply, Allocations and Computed Beneficial Consumptive Use Above and Below Guide Rock During Water-Short Administration Years.

For Water-Short-Administration Years, in addition to the normal calculations, the Computed Water Supply, Allocations, Computed Beneficial Consumptive Use and Imported Water Supply Credits shall also be calculated above Guide Rock as shown in Table 5C. These calculations shall be done in the same manner as in non-Water-Short Administration years except that water supplies originating below Guide Rock shall not be included in the calculations of water supplies originating above Guide Rock. The calculations of Computed Beneficial Consumptive Uses shall be also done in the same manner as in non-Water-Short Administration years except that Computed Beneficial Consumptive Uses from diversions below Guide Rock shall not be included. The depletions from the water diverted by the Superior and Courtland Canals at the Superior-Courtland Diversion Dam shall be included in the calculations of Computed Beneficial Consumptive Use above Guide Rock. Imported Water Supply Credits above Guide Rock, as described in Sub-section III.I., may be used as offsets against the Computed Beneficial Consumptive Use above Guide Rock by the State providing the Imported Water Supply Credits.

The Computed Water Supply of the Main Stem reach between Guide Rock and the Hardy gage shall be determined by taking the difference in stream flow at Hardy and Guide Rock, adding Computed Beneficial Consumptive Uses in the reach (this does not include the Computed Beneficial Consumptive Use from the Superior and Courtland Canal diversions), and subtracting return flows from the Superior and Courtland Canals in the reach. The Computed Water Supply above Guide Rock shall be determined by subtracting the Computed Water Supply of the Main Stem reach between Guide Rock and the Hardy gage from the total Computed Water Supply. Nebraska's Allocation above Guide Rock shall be determined by subtracting 48.9% of the Computed Water Supply of the Main Stem reach between Guide Rock and the Hardy gage from Nebraska's total Allocation. Nebraska's Computed Beneficial Consumptive Uses above Guide Rock shall be determined by subtracting Nebraska's Computed Beneficial Consumptive Uses below Guide Rock from Nebraska's total Computed Beneficial Consumptive Use.

I. Calculation of Imported Water Supply Credits During Water-Short Year Administration Years.

Imported Water Supply Credit during Water-Short Year Administration years shall be calculated consistent with Subsection V.B.2.b. of the Stipulation.

The following methodology shall be used to determine the extent to which Imported Water Supply Credit, as calculated by the RRCA Groundwater Model, can be credited to the State importing the water during Water-Short Year Administration years.

1. Monthly Imported Water Supply Credits

The RRCA Groundwater Model will be used to determine monthly Imported Water Supply Credits by State in each Sub-basin and for the Main Stem. The values for each Sub-basin will include all depletions and accretions upstream of the confluence with the Main Stem. The values for the Main Stem will include all depletions and accretions in stream reaches not otherwise accounted for in a Sub-basin. The values for the Main Stem will be computed separately for the reach 1) above Harlan County Dam, 2) between Harlan County Dam and Guide Rock, and 3) between Guide Rock and the Hardy gage. The Imported Water Supply Credit shall be the difference in stream flow for two runs of the model: a) the "base" run and b) the "no State import" run.

During Water-Short Year Administration years, Nebraska's credits in the Sub-basins shall be determined as described in Section III. A. 3.

2. Imported Water Supply Credits Above Harlan County Dam

Nebraska's Imported Water Supply Credits above Harlan County Dam shall be the sum of all the credits in the Sub-basins and the Main Stem above Harlan County Dam.

3. Imported Water Supply Credits Between Harlan County Dam and Guide Rock During the Irrigation Season

- a. During Water-Short Year Administration years, monthly credits in the reach between Harlan County Dam and Guide Rock shall be determined as the differences in the stream flows between the two runs at Guide Rock.
- b. The irrigation season shall be defined as starting on the first day of release of water from Harlan County Lake for irrigation use and ending on the last day of release of water from Harlan County Lake for irrigation use.
- c. Credit as an offset for a State's Computed Beneficial Consumptive Use above Guide Rock will be given to all the Imported Water Supply accruing in the reach between Harlan County Dam and Guide Rock during the irrigation season. If the period of the irrigation season does not coincide with the period of modeled flows, the amount of the Imported Water Supply credited during the irrigation season for that month shall be the total monthly modeled Imported Water Supply Credit times the number of days in the month occurring during the irrigation season divided by the total number of days in the month.

4. Imported Water Supply Credits Between Harlan County Dam and Guide Rock During the Non-Irrigation Season

- a. Imported Water Supply Credit shall be given between Harlan County Dam and Guide Rock during the period that flows are diverted to fill Lovewell Reservoir to the extent that imported water was needed to meet Lovewell Reservoir target elevations.
- b. Fall and spring fill periods shall be established during which credit shall be given for the Imported Water Supply Credit accruing in the reach. The fall period shall extend from the end of the irrigation season to December 1. The spring period shall extend from March 1 to May 31. The Lovewell target elevations for these fill periods are the projected end of November reservoir level and the projected end of May reservoir level for most

probable inflow conditions as indicated in Table 4 in the current Annual Operating Plan prepared by the Bureau of Reclamation.

c. The amount of water needed to fill Lovewell Reservoir for each period shall be calculated as the storage content of the reservoir at its target elevation at the end of the fill period minus the reservoir content at the start of the fill period plus the amount of net evaporation during this period minus White Rock Creek inflows for the same period.

d. If the fill period as defined above does not coincide with the period of modeled flows, the amount of the Imported Water Supply Credit during the fill period for that month shall be the total monthly modeled Imported Water Supply Credit times the number of days in the month occurring during the fill season divided by the total number of days in the month.

e. The amount of non-imported water available to fill Lovewell Reservoir to the target elevation shall be the amount of water available at Guide Rock during the fill period minus the amount of the Imported Water Supply Credit accruing in the reach during the same period.

f. The amount of the Imported Water Supply Credit that shall be credited against a State's Consumptive Use shall be the amount of water imported by that State that is available in the reach during the fill period or the amount of water needed to reach Lovewell Reservoir target elevations minus the amount of non-imported water available during the fill period, whichever is less.

5. Other Credits

Kansas and Nebraska will explore crediting Imported Water Supply that is otherwise useable by Kansas.

J. Calculations of Compact Compliance in Water-Short Year Administration Years

During Water-Short Year Administration, using the procedures described in Subsections III.A-D, the RRCA will calculate the Annual Allocations for each State, the Computed Beneficial Consumptive Use by each State, and Imported Water Supply Credit that a State may use to offset Computed Beneficial Consumptive Use in that year. The resulting annual and average values will be calculated as displayed in Tables 5 A-C and E.

If Nebraska is implementing an Alternative Water-Short-Year Administration Plan, data to determine Compact compliance will be shown in Table 5D. Nebraska's compliance with the Compact will be determined in the same manner as Nebraska's Above Guide Rock

compliance except that compliance will be based on a three-year running average of the current year and previous two year calculations. In addition, Table 5 D. will display the sum of the previous two-year difference in Allocations above Guide Rock and Computed Beneficial Consumptive Uses above Guide Rock minus any Imported Water Credits and compare the result with the Alternative Water-Short-Year Administration Plan's expected decrease in Computed Beneficial Consumptive Use above Guide Rock. Nebraska will be within compliance with the Compact as long as the three-year running average difference in Column 8 is positive and the sum of the previous year and current year deficits above Guide Rock are not greater than the expected decrease in Computed Beneficial Consumptive Use under the plan.

IV. Specific Formulas

A. Computed Beneficial Consumptive Use

1. Computed Beneficial Consumptive Use of Groundwater:

The Computed Beneficial Consumptive Use caused by groundwater diversion shall be determined by the RRCA Groundwater Model as described in Subsection III.D.1.

2. Computed Beneficial Consumptive Use of Surface Water:

The Computed Beneficial Consumptive Use of surface water shall be calculated as follows:

a) Non-Federal Canals

Computed Beneficial Consumptive Use from diversions by non- federal canals shall be 60 percent of the diversion; the return flow shall be 40 percent of the diversion

b) Individual Surface Water Pumps

Computed Beneficial Consumptive Use from small individual surface water pumps shall be 75 percent of the diversion; return flows will be 25 percent of the diversion unless a state provides data on the amount of different system types in a Sub-basin, in which case the following percentages will be used for each system type:

Gravity Flow. 30%

Center Pivot	17%
LEPA	10%

c) Federal Canals

Computed Beneficial Consumptive Use of diversions by Federal canals will be calculated as shown in Attachment 7. For each Bureau of Reclamation Canal the field deliveries shall be subtracted from the diversion from the river to determine the canal losses. The field delivery shall be multiplied by one minus an average system efficiency for the district to determine the loss of water from the field. Eighty-two percent of the sum of the field loss plus the canal loss shall be considered to be the return flow from the canal diversion for diversions occurring during the irrigation season (May-September). For recharge diversions occurring during the non-irrigation season (October-April), 92 percent of the sum of the field loss plus the canal loss shall be considered to be the return flow from the canal diversion. The assumed field efficiencies and the amount of the field and canal loss that reaches the stream may be reviewed by the RRCA and adjusted as appropriate to insure their accuracy.

d) Non-irrigation Uses

Any non-irrigation uses diverting or pumping more than 50 acre-feet per year will be required to measure diversions. Non-irrigation uses diverting more than 50 Acre-feet per year will be assessed a Computed Beneficial Consumptive Use of 50% of what is pumped or diverted, unless the entity presents evidence to the RRCA demonstrating a different percentage should be used.

e) Evaporation from Federal Reservoirs

Net Evaporation from Federal Reservoirs will be calculated as follows:

(1) Harlan County Lake, Evaporation Calculation

April 1 through October 31:

Evaporation from Harlan County Lake is calculated by the Corps of Engineers on a daily basis from April 1 through October 31. Daily readings are taken from a Class A evaporation pan maintained near the project office. Any precipitation recorded at the project office is added to the pan reading to obtain the actual evaporation amount.

The pan value is multiplied by a pan coefficient that varies by month. These values are:

March	.56
April	.52
May	.53
June	.60
July	.68
August	.78
September	.91
October	1.01

The pan coefficients were determined by studies the Corps of Engineers conducted a number of years ago. The result is the evaporation in inches. It is divided by 12 and multiplied by the daily lake surface area in acres to obtain the evaporation in Acre-feet. The lake surface area is determined by the 8:00 a.m. elevation reading applied to the lake's area-capacity data. The area-capacity data is updated periodically through a sediment survey. The last survey was completed in December 2000.

November 1 through March 31

During the winter season, a monthly total evaporation in inches has been determined. The amount varies with the percent of ice cover. The values used are:

HARLAN COUNTY LAKE

Estimated Evaporation in Inches
Winter Season -- Monthly Total

PERCENTAGE OF ICE COVER

	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
JAN	0.88	0.87	0.85	0.84	0.83	0.82	0.81	0.80	0.78	0.77	0.76
FEB	0.90	0.88	0.87	0.86	0.85	0.84	0.83	0.82	0.81	0.80	0.79
MAR	1.29	1.28	1.27	1.26	1.25	1.24	1.23	1.22	1.21	1.20	1.19
OCT	4.87			NO ICE							
NOV	2.81			NO ICE							
DEC	1.31	1.29	1.27	1.25	1.24	1.22	1.20	1.18	1.17	1.16	1.14

The monthly total is divided by the number of days in the month

to obtain a daily evaporation value in inches. It is divided by 12 and multiplied by the daily lake surface area in acres to obtain the evaporation in Acre-feet. The lake surface area is determined by the 8:00 a.m. elevation reading applied to the lake's area-capacity data. The area-capacity data is updated periodically through a sediment survey. The last survey was completed in December 2000.

To obtain the net evaporation, the monthly precipitation on the lake is subtracted from the monthly gross evaporation. The monthly precipitation is calculated by multiplying the sum of the month's daily precipitation in inches by the average of the end of the month lake surface area for the previous month and the end of the month lake surface area for the current month in acres and dividing the result by 12 to obtain the precipitation for the month in acre feet.

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. 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.

(2) Evaporation Computations for Bureau of Reclamation Reservoirs

The Bureau of Reclamation computes the amount of evaporation loss on a monthly basis at Reclamation reservoirs. The following procedure is utilized in calculating the loss in Acre-feet.

An evaporation pan reading is taken each day at the dam site. This measurement is the amount of water lost from the pan over a 24-hour period in inches. The evaporation pan reading is adjusted for any precipitation recorded during the 24-hour period. Instructions for determining the daily pan evaporation are found in the "National Weather Service Observing Handbook No. 2 – Substation Observations." All dams located in the Kansas River Basin with the exception of Bonny Dam are National Weather Service Cooperative

Observers. The daily evaporation pan readings are totaled at the end of each month and converted to a “free water surface” (FWS) evaporation, also referred to as “lake” evaporation. The FWS evaporation is determined by multiplying the observed pan evaporation by a coefficient of .70 at each of the reservoirs. This coefficient can be affected by several factors including water and air temperatures. The National Oceanic and Atmospheric Administration (NOAA) has published technical reports describing the determination of pan coefficients. The coefficient used is taken from the “NOAA Technical Report NWS 33, Map of coefficients to convert class A pan evaporation to free water surface evaporation”. This coefficient is used for the months of April through October when evaporation pan readings are recorded at the dams. The monthly FWS evaporation is then multiplied by the average surface area of the reservoir during the month in acres. Dividing this value by twelve will result in the amount of water lost to evaporation in Acre-feet during the month.

During the winter months when the evaporation pan readings are not taken, monthly evaporation tables based on the percent of ice cover are used. The tables used were developed by the Corps of Engineers and were based on historical average evaporation rates. A separate table was developed for each of the reservoirs. The monthly evaporation rates are multiplied by the .70 coefficient for pan to free water surface adjustment, divided by twelve to convert inches to feet and multiplied by the average reservoir surface area during the month in acres to obtain the total monthly evaporation loss in Acre-feet.

To obtain the net evaporation, the monthly precipitation on the lake is subtracted from the monthly gross evaporation. The monthly precipitation is calculated by multiplying the sum of the month's daily precipitation in inches by the average of the end of the month lake surface area for the previous month and the end of the month lake surface area for the current month in acres and dividing the result by 12 to obtain the precipitation for the month in acre feet.

f) Non-Federal Reservoir Evaporation:

For Non-Federal Reservoirs with a storage capacity less than 200 Acre-feet, the presumptive average annual surface area is 25% of the area at the principal spillway elevation. Net evaporation for each such Non-Federal Reservoir will be calculated by multiplying the presumptive average annual surface area by the net evaporation from the nearest climate and evaporation

station to the Non-Federal Reservoir. A State may provide actual data in lieu of the presumptive criteria.

Net evaporation from Non-Federal Reservoirs with 200 Acre-feet of storage or greater will be calculated by multiplying the average annual surface area (obtained from the area-capacity survey) and the net evaporation from the nearest evaporation and climate station to the reservoir. If the average annual surface area is not available, the Non-Federal Reservoirs with 200 Acre-feet of storage or greater will be presumed to be full at the principal spillway elevation.

B. Specific Formulas for Each Sub-basin and the Main Stem

All calculations shall be based on the calendar year and shall be rounded to the nearest 10 Acre-feet using the conventional rounding formula of rounding up for all numbers equal to five or higher and otherwise rounding down.

Abbreviations:

CBCU	= Computed Beneficial Consumptive Use
CWS	= Computed Water Supply
D	= Non-Federal Canal Diversions for Irrigation
Ev	= Evaporation from Federal Reservoirs
EvNFR	= Evaporation from Non-Federal Reservoirs
FF	= Flood Flow
GW	= Groundwater Computed Beneficial Consumptive Use (includes irrigation and non-irrigation uses)
IWS	= Imported Water Supply Credit from Nebraska
M&I	= Non-Irrigation Surface Water Diversions (Municipal and Industrial)
P	= Small Individual Surface Water Pump Diversions for Irrigation
RF	= Return Flow
VWS	= Virgin Water Supply
c	= Colorado
k	= Kansas
n	= Nebraska
ΔS	= Change in Federal Reservoir Storage
%	= Average system efficiency for individual pumps in the Sub-basin
% BRF	= Percent of Diversion from Bureau Canals that returns to the stream
###	= Value expected to be zero

3. North Fork of Republican River in Colorado ²

$$\text{CBCU Colorado} = 0.6 \times \text{Haigler Canal Diversion Colorado} + 0.6 \times D_c + \% \times P_c + 0.5 \times M\&I_c + E_vNFR_c + G_Wc$$

$$\text{CBCU Kansas} = G_Wk$$

$$\text{CBCU Nebraska} = 0.6 \times \text{Haigler Canal Diversion Nebraska} + G_Wn$$

Note: The diversion for Haigler Canal is split between Colorado and Nebraska based on the percentage of land irrigated in each state

$$\text{VWS} = \text{North Fork of the Republican River at the State Line, Stn. No. 06823000} + \text{CBCUc} + \text{CBCUk} + \text{CBCUn} + \text{Nebraska Haigler Canal RF} - \text{IWS}$$

Note: The Nebraska Haigler Canal RF returns to the Main Stem

$$\text{CWS} = \text{VWS} - \text{FF}$$

$$\text{Allocation Colorado} = 0.224 \times \text{CWS}$$

$$\text{Allocation Nebraska} = 0.246 \times \text{CWS}$$

$$\text{Unallocated} = 0.53 \times \text{CWS}$$

4. Arikaree River ²

$$\text{CBCU Colorado} = 0.6 \times D_c + \% \times P_c + 0.5 \times M\&I_c + E_vNFR_c + G_Wc$$

$$\text{CBCU Kansas} = 0.6 \times D_k + \% \times P_k + 0.5 \times M\&I_k + E_vNFR_k + G_Wk$$

$$\text{CBCU Nebraska} = 0.6 \times D_n + \% \times P_n + 0.5 \times M\&I_n + E_vNFR_n + G_Wn$$

$$\text{VWS} = \text{Arikaree Gage at Haigler Stn. No. 06821500} + \text{CBCUc} + \text{CBCUk} + \text{CBCUn} - \text{IWS}$$

² The RRCA will investigate whether return flows from the Haigler Canal diversion in Colorado may return to the Arikaree River, not the North Fork of the Republican River, as indicated in the formulas. If there are return flows from the Haigler Canal to the Arikaree River, these formulas will be changed to recognize those returns.

$$\text{CWS} = \text{VWS} - \text{FF}$$

$$\text{Allocation Colorado} = 0.785 \times \text{CWS}$$

$$\text{Allocation Kansas} = 0.051 \times \text{CWS}$$

$$\text{Allocation Nebraska} = 0.168 \times \text{CWS}$$

$$\text{Unallocated} = -0.004 \times \text{CWS}$$

5. Buffalo Creek

$$\text{CBCU Colorado} = 0.6 \times \text{Dc} + \% \times \text{Pc} + 0.5 \times \text{M\&In} + \text{EvNFRc} + \text{GWc}$$

$$\text{CBCU Kansas} = \text{GWk}$$

$$\text{CBCU Nebraska} = 0.6 \times \text{Dn} + \% \times \text{Pn} + 0.5 \times \text{M\&In} + \text{EvNFRn} + \text{GWn}$$

$$\text{VWS} = \text{Buffalo Creek near Haigler Gage Stn. No. 06823500} + \text{CBCUc} + \text{CBCUk} + \text{CBCUn} - \text{IWS}$$

$$\text{CWS} = \text{VWS} - \text{FF}$$

$$\text{Allocation Nebraska} = 0.330 \times \text{CWS}$$

$$\text{Unallocated} = 0.670 \times \text{CWS}$$

6. Rock Creek

$$\text{CBCU Colorado} = \text{GWc}$$

$$\text{CBCU Kansas} = \text{GWk}$$

$$\text{CBCU Nebraska} = 0.6 \times \text{Dn} + \% \times \text{Pn} + 0.5 \times \text{M\&In} + \text{EvNFRn} + \text{GWn}$$

$$\text{VWS} = \text{Rock Creek at Parks Gage Stn. No. 06824000} + \text{CBCUc} + \text{CBCUk} + \text{CBCUn} - \text{IWS}$$

$$\text{CWS} = \text{VWS} - \text{FF}$$

$$\text{Allocation Nebraska} = 0.400 \times \text{CWS}$$

Unallocated = 0.600 x CWS

7. South Fork Republican River

CBCU Colorado = 0.6 x Hale Ditch Diversion + 0.6 x Dc + % x Pc + 0.5 x M&Ic + EvNFRc + Bonny Reservoir Ev + GWc

CBCU Kansas = 0.6 x Dk + % x Pk + 0.5 x M&Ik + EvNFRk + GWk

CBCU Nebraska = 0.6 x Dn + % x Pn + 0.5 x M&In + EvNFRn + GWn

VWS = South Fork Republican River near Benkelman Gage Stn. No. 06827500 + CBCUc + CBCUk + CBCUn + ΔS Bonny Reservoir – IWS

CWS = VWS - ΔS Bonny Reservoir - FF

Allocation Colorado = 0.444 x CWS

Allocation Kansas = 0.402 x CWS

Allocation Nebraska = 0.014 x CWS

Unallocated = 0.140 x CWS

8. Frenchman Creek in Nebraska

CBCU Colorado = GWc

CBCU Kansas = GWk

CBCU Nebraska = Culbertson Canal Diversions (IRR Season) x (1-%BRF) + Culbertson Canal Diversions (Non-IRR Season) x (1-92%) + Culbertson Extension (IRR Season) x (1-%BRF) + Culbertson Extension (Non-IRR Season) x (1-92%) + 0.6 x Champion Canal Diversion + 0.6 x Riverside Canal Diversion + 0.6 x Dn + % x Pn + 0.5 x M&In + EvNFRn + Enders Reservoir Ev + GWn

VWS = Frenchman Creek in Culbertson, Nebraska Gage Stn. No. 06835500 + CBCUc + CBCUk + CBCUn + 0.17 x

Culbertson Diversion RF + Culbertson Extension RF + 0.78
x Riverside Diversion RF + ΔS Enders Reservoir – IWS

Note: 17% of the Culbertson Diversion RF and 100% of the
Culbertson Extension RF return to the Main Stem

CWS = VWS - ΔS Enders Reservoir – FF

Allocation Nebraska = 0.536 x CWS

Unallocated = 0.464 x CWS

9. Driftwood Creek

CBCU Colorado = GWc

CBCU Kansas = 0.6 x Dk + % x Pk + 0.5 x M&Ik + EvNFRk + GWk

CBCU Nebraska = 0.6 x Dn + % x Pn + 0.5 x M&In + EvNFRn + GWn

VWS = Driftwood Creek near McCook Gage Stn. No. 06836500 +
CBCUc + CBCUk + CBCUn – 0.24 x Meeker Driftwood
Canal RF - IWS

Note: 24 % of the Meeker Driftwood Canal RF returns to
Driftwood Creek

CWS = VWS – FF

Allocation Kansas = 0.069 x CWS

Allocation Nebraska = 0.164 x CWS

Unallocated = 0.767 x CWS

10. Red Willow Creek in Nebraska

CBCU Colorado = GWc

CBCU Kansas = GWk

CBCU Nebraska = 0.1 x Red Willow Canal CBCU + 0.6 x Dn + % x Pn + 0.5
x M&In + EvNFRn + 0.1 x Hugh Butler Lake Ev + GWn

Note:

Red Willow Canal CBCU = Red Willow Canal Diversion
(IRR Season) x (1- % BRF) + Red Willow Canal Diversion
(Non-IRR Season) x (1-92%)

90% of the Red Willow Canal CBCU and 90% of Hugh
Butler Lake Ev charged to Nebraska's CBCU in the Main
Stem

VWS = Red Willow Creek near Red Willow Gage Stn. No.
06838000 + CBCUc + CBCUk + CBCUn + 0.9 x Red
Willow Canal CBCU + 0.9 x Hugh Butler Lake Ev + 0.9
x Red Willow Canal RF + ΔS Hugh Butler Lake – IWS

Note: 90% of the Red Willow Canal RF returns to the Main
Stem

CWS = VWS - ΔS Hugh Butler Lake - FF

Allocation Nebraska = 0.192 x CWS

Unallocated = 0.808 x CWS

11. Medicine Creek

CBCU Colorado = GWc

CBCU Kansas = GWk

CBCU Nebraska = 0.6 x Dn above and below gage + % x Pn above and below
gage + 0.5 x M&In above and below gage + EvNFRn above
and below gage + GWn

Note: Harry Strunk Lake Ev charged to Nebraska's CBCU
in the Main Stem.

CU from Harry Strunk releases in the Cambridge Canal is
charged to the Main stem (no adjustment to the VWS
formula is needed as this water shows up in the Medicine
Creek gage).

VWS = Medicine Creek below Harry Strunk Lake Gage Stn. No.

06842500 + CBCUc + CBCUk + CBCUn – 0.6 x Dn below gage - % x Pn below gage – 0.5 * M&In below gage - EvNFRn below gage + Harry Strunk Lake Ev + ΔS Harry Strunk Lake– IWS

Note: The CBCU surface water terms for Nebraska which occur below the gage are added in the VWS for the Main Stem

CWS = VWS - ΔS Harry Strunk Lake - FF

Allocation Nebraska = 0.091 x CWS

Unallocated = 0.909 x CWS

12. Beaver Creek

CBCU Colorado = 0.6 x Dc + % x Pc + 0.5 x M&Ic + EvNFRc + GWc

CBCU Kansas = 0.6 x Dk + % x Pk + 0.5 x M&Ik + EvNFRk + GWk

CBCU Nebraska = 0.6 x Dn above and below gage + % x Pn above and below gage + 0.5 x M&In above and below gage + EvNFRn above and below gage + GWn

VWS = Beaver Creek near Beaver City gage Stn. No. 06847000 + BCUC + CBCUk + CBCUn – 0.6 x Dn below gage - % x Pn below gage – 0.5 * M&In below gage - EvNFRn below gage – IWS

Note: The CBCU surface water terms for Nebraska which occur below the gage are added in the VWS for the Main Stem

CWS = VWS – FF

Allocation Colorado = 0.200 x CWS

Allocation Kansas = 0.388 x CWS

Allocation Nebraska = 0.406 x CWS

Unallocated = 0.006 x CWS

13. Sappa Creek

CBCU Colorado = GWc

CBCU Kansas = 0.6 x Dk + % x Pk + 0.5 x M&Ik + EvNFRk + GWk

CBCU Nebraska = 0.6 x Dn above and below gage + % x Pn above and below gage + 0.5 x M&In above and below gage + EvNFRn above and below gage + GWn

VWS = Sappa Creek near Stamford gage Stn. No. 06847500 – Beaver Creek near Beaver City gage Stn. No. 06847000 + CBCUc + CBCUk + CBCUn – 0.6 x Dn below gage - % x Pn below gage – 0.5 * M&In below gage - EvNFRn below gage – IWS

Note: The CBCU surface water terms for Nebraska which occur below the gage are added in the VWS for the Main Stem

CWS = VWS - FF

Allocation Kansas = 0.411 x CWS

Allocation Nebraska = 0.411 x CWS

Unallocated = 0.178 x CWS

14. Prairie Dog Creek

CBCU Colorado = GWc

CBCU Kansas = Almena Canal Diversion x (1-%BRF) + 0.6 x Dk + % x Pk + 0.5 x M&Ik + EvNFRk + Keith Sebelius Lake Ev + GWk

CBCU Nebraska = 0.6 x Dn below gage + % x Pn below gage + 0.5 x M&In below gage + EvNFRn + GWn below gage

VWS = Prairie Dog Creek near Woodruff, Kansas USGS Stn. No.

$06848500 + \text{CBCUc} + \text{CBCUk} + \text{CBCUn} - 0.6 \times \text{Dn below gage} - \% \times \text{Pn below gage} - 0.5 \times \text{M\&In below gage} - \text{EvNFRn below gage} + \Delta\text{S Keith Sebelius Lake} - \text{IWS}$

Note: The CBCU surface water terms for Nebraska which occur below the gage are added in the VWS for the Main Stem

CWS = VWS - $\Delta\text{S Keith Sebelius Lake}$ - FF

Allocation Kansas = $0.457 \times \text{CSW}$

Allocation Nebraska = $0.076 \times \text{CWS}$

Unallocated = $0.467 \times \text{CWS}$

15. The North Fork of the Republican River in Nebraska and the Main Stem of the Republican River between the junction of the North Fork and the Arikaree River and the Republican River near Hardy

CBCU Colorado = GWc

CBCU Kansas =
 (Deliveries from the Courtland Canal to Kansas above Lovewell) $\times (1 - \% \text{BRF})$
 + Amount of transportation loss of Courtland Canal deliveries to Lovewell that does not return to the river, charged to Kansas
 + (Diversions of Republican River water from Lovewell Reservoir by the Courtland Canal below Lovewell) $\times (1 - \% \text{BRF})$
 + $0.6 \times \text{Dk}$
 + $\% \times \text{Pk}$
 + $0.5 \times \text{M\&Ik}$
 + EvNFRk
 + Harlan County Lake Ev charged to Kansas
 + Lovewell Reservoir Ev charged to the Republican River
 + GWk

CBCU Nebraska =
 Deliveries from Courtland Canal to Nebraska lands $\times (1 - \% \text{BRF})$
 + Superior Canal (IRR Season) $\times (1 - \% \text{BRF})$ + Superior Canal

(Non-IRR Season) x (1 - 92%)
 + Franklin Pump Canal (IRR Season) x (1- %BRF) + Franklin Pump Canal (Non-IRR Season) x (1 - 92 %)
 + Franklin Canal (IRR Season) x (1- %BRF) + Franklin Canal (Non-IRR Season) x (1 - 92%)
 + Naponee Canal (IRR Season) x (1- %BRF) + Naponee Canal (Non-IRR Season) x (1 - 92%)
 + Cambridge Canal (IRR Season) x (1- %BRF) + Cambridge Canal (Non-IRR Season) x (1 - 92%)
 + Bartley Canal (IRR Season) x (1- %BRF) + Bartley Canal (Non-IRR Season) x (1 - 92%)
 + Meeker-Driftwood Canal (IRR Season) x (1- %BRF) + Meeker-Driftwood Canal (Non-IRR Season) x (1- 92%)
 + 0.9 x Red Willow Canal CBCU
 + 0.6 x Dn
 + % x Pn
 + 0.5 x M&In
 + EvNFRn
 + 0.9 x Hugh Butler Lake Ev
 + Harry Strunk Lake Ev
 + Swanson Lake Ev
 + Harlan County Lake Ev charged to Nebraska
 + GWn

Notes:

The allocation of transportation losses in the Courtland Canal above Lovewell between Kansas and Nebraska shall be done by the Bureau of Reclamation and reported in their “Courtland Canal Above Lovewell” spreadsheet. Deliveries and losses associated with deliveries to both Nebraska and Kansas above Lovewell shall be reflected in the Bureau’s Monthly Water District reports. Losses associated with delivering water to Lovewell shall be separately computed.

Amount of transportation loss of the Courtland Canal deliveries to Lovewell that does not return to the river, charged to Kansas shall be 18% of the Bureau’s estimate of losses associated with these deliveries.

Red Willow Canal CBCU = Red Willow Canal Diversion x (IRR Season) x (1- % BRF) + Red Willow Canal Diversion (Non-IRR Season) x (1 - 92%)

10% of the Red Willow Canal CBCU is charged to Nebraska’s CBCU in Red Willow Creek sub-basin

10% of Hugh Butler Lake Ev is charged to Nebraska's CBCU in the Red Willow Creek sub-basin

None of the Harry Strunk Lake EV is charged to Nebraska's CBCU in the Medicine Creek sub-basin

VWS

=

Republican River near Hardy Gage Stn. No. 06853500

- North Fork of the Republican River at the State Line, Stn.

No. 06823000

- Arikaree Gage at Haigler Stn. No. 06821500

- Buffalo Creek near Haigler Gage Stn. No. 06823500

- Rock Creek at Parks Gage Stn. No. 06824000

-South Fork Republican River near Benkelman Gage Stn. No. 06827500

- Frenchman Creek in Culbertson Stn. No. 06835500

- Driftwood Creek near McCook Gage Stn. No. 06836500

- Red Willow Creek near Red Willow Gage Stn. No. 06838000

- Medicine Creek below Harry Strunk Lake Gage Stn. No. 06842500

- Sappa Creek near Stamford Gage Stn. No. 06847500

- Prairie Dog Creek near Woodruff, Kansas Stn. No. 68-485000

+ CBCUc

+ CBCUn

+ 0.6 x Dk

+ % x Pk

+ 0.5 x M&Ik

+ EvNFRk

+ Harlan County Lake Ev charged to Kansas

+Amount of transportation loss of the Courtland Canal above the Stateline that does not return to the river, charged to Kansas

+GWk

- 0.9 x Red Willow Canal CBCU

- 0.9 x Hugh Butler Ev

- Harry Strunk Ev

+ 0.6 x Dn below Medicine Creek gage

+ % x Pn below Medicine Creek gage
+ 0.5 * M&In below Medicine Creek gage
+ EvNFRn below Medicine Creek gage
+ 0.6 x Dn below Beaver Creek gage
+ % x Pn below Beaver Creek gage
+ 0.5 * M&In below Beaver Creek gage
+ EvNFRn below Beaver Creek gage

+ 0.6 x Dn below Sappa Creek gage
+ % x Pn below Sappa Creek gage
+ 0.5 * M&In below Sappa Creek gage
+ EvNFRn below Sappa Creek gage

+ 0.6 x Dn below Prairie Dog Creek gage
+ % x Pn below Prairie Dog Creek gage
+ 0.5 * M&In below Prairie Dog Creek gage
+ EvNFRn below Prairie Dog Creek gage

+ Change in Storage Harlan County Lake
+ Change in Storage Swanson Lake

- Nebraska Haigler Canal RF
- 0.78 x Riverside Canal RF
- 0.17 x Culbertson Canal RF
- Culbertson Canal Extension RF to Main Stem
+ 0.24 x Meeker Driftwood Canal RF which returns to
Driftwood Creek
- 0.9 x Red Willow Canal RF

+ Courtland Canal at Kansas-Nebraska State Line Gage Stn
No. 06852500

- Courtland Canal RF in Kansas above Lovewell Reservoir

-IWS

Notes:

None of the Nebraska Haigler Canal RF returns to the North
Fork of the Republican River

83% of the Culbertson Diversion RF and none of the
Culbertson Extension RF return to Frenchman Creek

24 % of the Meeker Driftwood Canal RF returns to
Driftwood Creek.

10% of the Red Willow Canal RF returns to Red Willow Creek

Courtland Canal RF in Kansas above Lovewell Reservoir =
 $0.015 \times$ (Courtland Canal at Kansas-Nebraska State Line
Gage Stn No. 06852500)

CWS = VWS - Change in Storage Harlan County Lake - Change in
Storage Swanson Lake - FF

Allocation Kansas = $0.511 \times$ CWS

Allocation Nebraska = $0.489 \times$ CWS

V. Annual Data/ Information Requirements, Reporting, and Verification

The following information for the previous calendar year shall be provided to the members of the RRCA Engineering Committee by April 15th of each year, unless otherwise specified.

All information shall be provided in electronic format, if available.

Each State agrees to provide all information from their respective State that is needed for the RRCA Groundwater Model and RRCA Accounting Procedures and Reporting Requirements, including but not limited to the following:

A. Annual Reporting

1. Surface water diversions and irrigated acreage:

Each State will tabulate the canal, ditch, and other surface water diversions that are required by RRCA annual compact accounting and the RRCA Groundwater Model on a monthly format (or a procedure to distribute annual data to a monthly basis) and will forward the surface water diversions to the other States. This will include available diversion, wasteway, and farm delivery data for canals diverting from the Platte River that contribute to Imported Water Supply into the Basin. Each State will provide the water right number, type of use, system type, location, diversion amount, and acres irrigated.

2. Groundwater pumping and irrigated acreage:

Each State will tabulate and provide all groundwater well pumping estimates that are required for the RRCA Groundwater Model to the other States.

Colorado – will provide an estimate of pumping based on a county format that is based upon system type, Crop Irrigation Requirement (CIR), irrigated acreage, crop distribution, and irrigation efficiencies. Colorado will require installation of a totalizing flow meter, installation of an hours meter with a measurement of the pumping rate, or determination of a power conversion coefficient for 10% of the active wells in the Basin by December 31, 2005. Colorado will also provide an annual tabulation for each groundwater well that measures groundwater pumping by a totalizing flow meter, hours meter or power conversion coefficient that includes: the groundwater well permit number, location, reported hours, use, and irrigated acreage.

Kansas - will provide an annual tabulation by each groundwater well that includes: water right number, groundwater pumping determined by a meter on each well (or group of wells in a manifold system) or by reported hours of use and rate; location; system type (gravity, sprinkler, LEPA, drip, etc.); and irrigated acreage. Crop distribution will be provided on a county basis.

Nebraska – will provide an annual tabulation through the representative Natural Resource District (NRD) in Nebraska that includes: the well registration number or other ID number; groundwater pumping determined by a meter on each well (or group of wells in a manifold system) or by reported hours of use and rate; wells will be identified by; location; system type (gravity, sprinkler, LEPA, drip, etc.); and irrigated acreage. Crop distribution will be provided on a county basis.

3. Climate information:

Each State will tabulate and provide precipitation, temperature, relative humidity or dew point, and solar radiation for the following climate stations:

State	Identification	Name
Colorado		
Colorado	C050109	Akron 4 E
Colorado	C051121	Burlington
Colorado	C054413	Julesburg
Colorado	C059243	Wray
Kansas	C140439	Atwood 2 SW
Kansas	C141699	Colby 1SW
Kansas	C143153	Goodland
Kansas	C143837	Hoxie

Kansas	C145856	Norton 9 SSE
Kansas	C145906	Oberlin1 E
Kansas	C147093	Saint Francis
Kansas	C148495	Wakeeny
Nebraska	C250640	Beaver City
Nebraska	C250810	Bertrand
Nebraska	C252065	Culbertson
Nebraska	C252690	Elwood 8 S
Nebraska	C253365	Gothenburg
Nebraska	C253735	Hebron
Nebraska	C253910	Holdredge
Nebraska	C254110	Imperial
Nebraska	C255090	Madrid
Nebraska	C255310	McCook
Nebraska	C255565	Minden
Nebraska	C256480	Palisade
Nebraska	C256585	Paxton
Nebraska	C257070	Red Cloud
Nebraska	C258255	Stratton
Nebraska	C258320	Superior
Nebraska	C258735	Upland
Nebraska	C259020	Wauneta 3 NW

4. Crop Irrigation Requirements:

Each State will tabulate and provide estimates of crop irrigation requirement information on a county format. Each State will provide the percentage of the crop irrigation requirement met by pumping; the percentage of groundwater irrigated lands served by sprinkler or flood irrigation systems, the crop irrigation requirement; crop distribution; crop coefficients; gain in soil moisture from winter and spring precipitation, net crop irrigation requirement; and/or other information necessary to compute a soil/water balance.

5. Streamflow Records from State-Maintained Gaging Records:

Streamflow gaging records from the following State maintained gages will be provided:

Station No	Name
00126700	Republican River near Trenton
06831500	Frenchman Creek near Imperial
06832500	Frenchman Creek near Enders

06835000	Stinking Water Creek near Palisade
06837300	Red Willow Creek above Hugh Butler Lake
06837500	Red Willow Creek near McCook
06841000	Medicine Creek above Harry Strunk Lake
06842500	Medicine Creek below Harry Strunk Lake
06844000	Muddy Creek at Arapahoe
06844210	Turkey Creek at Edison
06847000	Beaver Creek near Beaver City
	Republican River at Riverton
06851500	Thompson Creek at Riverton
06852000	Elm Creek at Amboy
	Republican River at the Superior-Courtland Diversion Dam

6. Platte River Reservoirs:

The State of Nebraska will provide the end-of-month contents, inflow data, outflow data, area-capacity data, and monthly net evaporation, if available, from Johnson Lake; Elwood Reservoir; Sutherland Reservoir; Maloney Reservoir; and Jeffrey Lake.

7. Water Administration Notification:

The State of Nebraska will provide the following information that describes the protection of reservoir releases from Harlan County Lake and for the administration of water rights junior in priority to February 26, 1948:

Date of notification to Nebraska water right owners to curtail their diversions, the amount of curtailment, and length of time for curtailment.

The number of notices sent.

The number of diversions curtailed and amount of curtailment in the Harlan County Lake to Guide Rock reach of the Republican River.

8. Moratorium:

Each State will provide a description of all new Wells constructed in the Basin Upstream of Guide Rock including the owner, location (legal description), depth and diameter or dimension of the constructed water well, casing and screen information, static water level, yield of the water well in gallons per minute or gallons per hour, and intended use of the water well.

Designation whether the Well is a:

- a. Test hole;
- b. Dewatering Well with an intended use of one year or less;
- c. Well designed and constructed to pump fifty gallons per minute or less;
- d. Replacement Water Well, including a description of the Well that is replaced providing the information described above for new Wells and a description of the historic use of the Well that is replaced;
- e. Well necessary to alleviate an emergency situation involving provision of water for human consumption, including a brief description of the nature of the emergency situation and the amount of water intended to be pumped by and the length of time of operation of the new Well;
- f. Transfer Well, including a description of the Well that is transferred providing the information described above for new Wells and a description of the Historic Consumptive Use of the Well that is transferred;
- g. Well for municipal and/or industrial expansion of use;

Wells in the Basin in Northwest Kansas or Colorado. Kansas and Colorado will provide the information described above for new Wells along with copies of any other information that is required to be filed with either State of local agencies under the laws, statutes, rules and regulations in existence as of April 30, 2002, and;

Any changes in State law in the previous year relating to existing Moratorium.

9. Non-Federal Reservoirs:

Each State will conduct an inventory of Non Federal Reservoirs by December 31, 2004, for inclusion in the annual Compact Accounting. The inventory shall include the following information: the location, capacity (in Acre-feet) and area (in acres) at the principal spillway elevation of each Non-Federal Reservoir. The States will annually provide any updates to the initial inventory of Non-Federal Reservoirs, including enlargements that are constructed in the previous year.

Owners/operators of Non-Federal Reservoirs with 200 Acre-feet of storage capacity or greater at the principal spillway elevation will be required to provide an area-capacity survey from State-approved plans or prepared by a licensed professional engineer or land surveyor.

B. RRCA Groundwater Model Data Input Files

1. Monthly groundwater pumping, surface water recharge, groundwater recharge, and precipitation recharge provided by county and indexed to the one square mile cell size.
2. Potential Evapotranspiration rate is set as a uniform rate for all phreatophyte vegetative classes – the amount is X at Y climate stations and is interpolated spatially using kriging.

C. Inputs to RRCA Accounting

1. Surface Water Information

- a. Streamflow gaging station records: obtained as preliminary USGS or Nebraska streamflow records, with adjustments to reflect a calendar year, at the following locations:

Arikaree River at Haigler, Nebraska
North Fork Republican River at Colorado-Nebraska state line
Buffalo Creek near Haigler, Nebraska
Rock Creek at Parks, Nebraska
South Fork Republican River near Benkelman, Nebraska
Frenchman Creek at Culbertson, Nebraska
Red Willow Creek near Red Willow, Nebraska
Medicine Creek below Harry Strunk Lake, Nebraska*
Beaver Creek near Beaver City, Nebraska*
Sappa Creek near Stamford, Nebraska
Prairie Dog Creek near Woodruff, Kansas
Courtland Canal at Nebraska-Kansas state line
Republican River near Hardy, Nebraska
Republican River at Superior-Courtland Diversion Dam near Guide Rock,
Nebraska (new)*

- b. Federal reservoir information: obtained from the United States Bureau of Reclamation:

Daily free water surface evaporation, storage, precipitation, reservoir release information, and updated area-capacity tables.

Federal Reservoirs:
Bonny Reservoir

Swanson Lake
Harry Strunk Lake
Hugh Butler Lake
Enders Reservoir
Keith Sebelius Lake
Harlan County Lake
Lovewell Reservoir

- c. Non-federal reservoirs obtained by each state: an updated inventory of reservoirs that includes the location, surface area (acres), and capacity (in Acre-feet), of each non-federal reservoir with storage capacity of fifteen (15) Acre-feet or greater at the principal spillway elevation. Supporting data to substantiate the average surface water areas that are different than the presumptive average annual surface area may be tendered by the offering State.

- d. Diversions and related data from USBR

Irrigation diversions by canal, ditch, and pumping station that irrigate more than two (2) acres
Diversions for non-irrigation uses greater than 50 Acre-feet
Farm Deliveries
Wasteway measurements
Irrigated acres

- e. Diversions and related data – from each respective State

Irrigation diversions by canal, ditch, and pumping station that irrigate more than two (2) acres
Diversions for non-irrigation uses greater than 50 Acre-feet
Wasteway measurements, if available

2. Groundwater Information

(From the RRCA Groundwater model as output files as needed for the accounting procedures)

- a. Imported water - mound credits in amount and time that occur in defined streamflow points/reaches of measurement or compliance – ex: gaging stations near confluence or state lines

- b. Groundwater depletions to streamflow (above points of measurement or compliance – ex: gaging stations near confluence or state lines)

3. Summary

The aforementioned data will be aggregated by Sub-basin as needed for RRCA accounting.

D. Verification

1. Documentation to be Available for Inspection Upon Request

- a. Well permits/ registrations database
- b. Copies of well permits/ registrations issued in calendar year
- c. Copies of surface water right permits or decrees
- d. Change in water right/ transfer historic use analyses
- e. Canal, ditch, or other surface water diversion records
- f. Canal, ditch, or other surface water measurements
- g. Reservoir storage and release records
- h. Irrigated acreage

2. Site Inspection

- a. Accompanied – reasonable and mutually acceptable schedule among representative state and/or federal officials.
- b. Unaccompanied – inspection parties shall comply with all laws and regulations of the State in which the site inspection occurs.

Table 1: Annual Virgin and Computed Water Supply, Allocations and Computed Beneficial Consumptive Uses by State, Main Stem and Sub-basin

Designated Drainage Basin	Col. 1: Virgin Water Supply	Col. 2: Computed Water Supply	Col. 3: Allocations				Col. 4: Computed Beneficial Consumptive Use		
			Colorado	Nebraska	Kansas	Unallocated	Colorado	Nebraska	Kansas
North Fork in Colorado									
Arikaree									
Buffalo									
Rock									
South Fork of Republican River									
Frenchman									
Driftwood									
Red Willow									
Medicine									
Beaver									
Sappa									
Prairie Dog									
North Fork of Republican River in Nebraska and Main Stem									
Total All Basins									
North Fork Of Republican River in Nebraska and Mainstem Including Unallocated Water									
Total									

Table 2: Original Compact Virgin Water Supply and Allocations

Designated Drainage Basin	Virgin Water Supply	Colorado Allocation	% of Total Drainage Basin Supply	Kansas Allocation	% of Total Drainage Basin Supply	Nebraska Allocation	% of Total Drainage Basin Supply	Unallocated	% of Total Drainage Basin Supply
North Fork - CO	44,700	10,000	22.4			11,000	24.6	23,700	53.0
Arikaree River	19,610	15,400	78.5	1,000	5.1	3,300	16.8	-90	-0.4
Buffalo Creek	7,890					2,600	33.0	5,290	67.0
Rock Creek	11,000					4,400	40.0	6,600	60.0
South Fork	57,200	25,400	44.4	23,000	40.2	800	1.4	8,000	14.0
Frenchman Creek	98,500					52,800	53.6	45,700	46.4
Driftwood Creek	7,300			500	6.9	1,200	16.4	5,600	76.7
Red Willow Creek	21,900					4,200	19.2	17,700	80.8
Medicine Creek	50,800					4,600	9.1	46,200	90.9
Beaver Creek	16,500	3,300	20.0	6,400	38.8	6,700	40.6	100	0.6
Sappa Creek	21,400			8,800	41.1	8,800	41.1	3,800	17.8
Prairie Dog Creek	27,600			12,600	45.7	2,100	7.6	12,900	46.7
Sub-total Tributaries	384,400							175,500	
Main Stem + Blackwood Creek	94,500								
Main Stem + Unallocated	270,000			138,000	51.1	132,000	48.9		
Total	478,900	54,100		190,300		234,500			

Table 3A: Table to Be Used to Calculate Colorado's Five-Year Running Average Allocation and Computed Beneficial Consumptive Use for Determining Compact Compliance

Colorado				
	Col. 1	Col. 2	Col. 3	Col. 4
Year	Allocation	Computed Beneficial Consumptive	Imported Water Supply Credit	Difference between Allocation and the Computed Beneficial Consumptive Use offset by Imported Water Supply Credit Col 1 – (Col 2- Col 3)
Year t= -4				
Year t= -3				
Year t= -2				
Year t= -1				
Current Year t= 0				
Average				

Table 3B. Table to Be Used to Calculate Kansas's Five-Year Running Average Allocation and Computed Beneficial Consumptive Use for Determining Compact Compliance

Kansas				
	Col. 1	Col. 2	Col. 3	Col. 4
Year	Allocation	Computed Beneficial Consumptive	Imported Water Supply Credit	Difference between Allocation and the Computed Beneficial Consumptive Use offset by Imported Water Supply Credit Col 1 – (Col 2- Col 3)
Year t= -4				
Year t= -3				
Year t= -2				
Year t= -1				
Current Year t= 0				
Average				

Table 3C. Table to Be Used to Calculate Nebraska's Five-Year Running Average Allocation and Computed Beneficial Consumptive Use for Determining Compact Compliance

Nebraska				
	Col. 1	Col. 2	Col. 3	Col. 4
Year	Allocation	Computed Beneficial Consumptive	Imported Water Supply Credit	Difference between Allocation and the Computed Beneficial Consumptive Use offset by Imported Water Supply Credit Col 1 – (Col 2- Col 3)
Year T= -4				
Year T= -3				
Year T= -2				
Year T= -1				
Current Year T= 0				
Average				

Table 4A: Colorado Compliance with the Sub-basin Non-impairment Requirement

	Col 1	Col 2	Col 3	Col 4	Col 5	Col 6
Sub-basin	Colorado Sub-basin Allocation (5-year running average)	Unallocated Supply (5-year running average)	Credits from Imported Water Supply (5-year running average)	Total Supply Available = Col 1+ Col 2 + Col 3 (5-year running average)	Colorado Computed Beneficial Consumptive Use (5-year running average)	Difference Between Available Supply and Computed Beneficial Consumptive Use = Col 4 – Col 5 (5-year running average)
North Fork Republican River Colorado						
Arikaree River						
South Fork Republican River						
Beaver Creek						

Table 4B: Kansas Compliance with the Sub-basin Non-impairment Requirement

	Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7
Sub-basin	Kansas Sub-basin Allocation (5-year running average)	Unallocated Supply (5-year running average)	Unused Allocation from Colorado (5-year running average)	Credits from Imported Water Supply (5-year running average)	Total Supply Available = Col 1+ Col 2+ Col 3 + Col 4 (5-year running average)	Kansas Computed Beneficial Consumptive Use (5-year running average)	Difference Between Available Supply and Computed Beneficial Consumptive Use = Col 5 – Col 6 (5-year running average)
Arikaree River							
South Fork Republican River							
Driftwood Creek							
Beaver Creek							
Sappa Creek							
Prairie Dog Creek							

Table 5A: Colorado Compliance During Water-Short Year Administration

Colorado				
	Col. 1	Col. 2	Col. 3	Col 4
Year	Allocation minus Allocation for Beaver Creek	Computed Beneficial Consumptive minus Computed Beneficial Consumptive Use for Beaver Creek	Imported Water Supply Credit excluding Beaver Creek	Difference between Allocation and the Computed Beneficial Consumptive Use offset by Imported Water Supply Credit for All Basins Except Beaver Creek Col 1 – (Col 2 – Col 3)
Year T= -4				
Year T= -3				
Year T= -2				
Year T= -1				
Current Year T= 0				
Average				

Table 5B: Kansas Compliance During Water-Short Year Administration

Kansas						
Year	Allocation			Computed Beneficial Consumptive Use`	Imported Water Supply Credit	Difference Between Allocation and the Computed Beneficial Consumptive Use offset by Imported Water Supply Credit
Column	1	2	3	4	5	6
	Sum Sub-basins	Kansas's Share of the Unallocated Supply	Total Col 1 + Col 2			Col 3 – (Col 4 – Col 5)
Previous Year						
Current Year						
Average						

Table 5C: Nebraska Compliance During Water-Short Year Administration

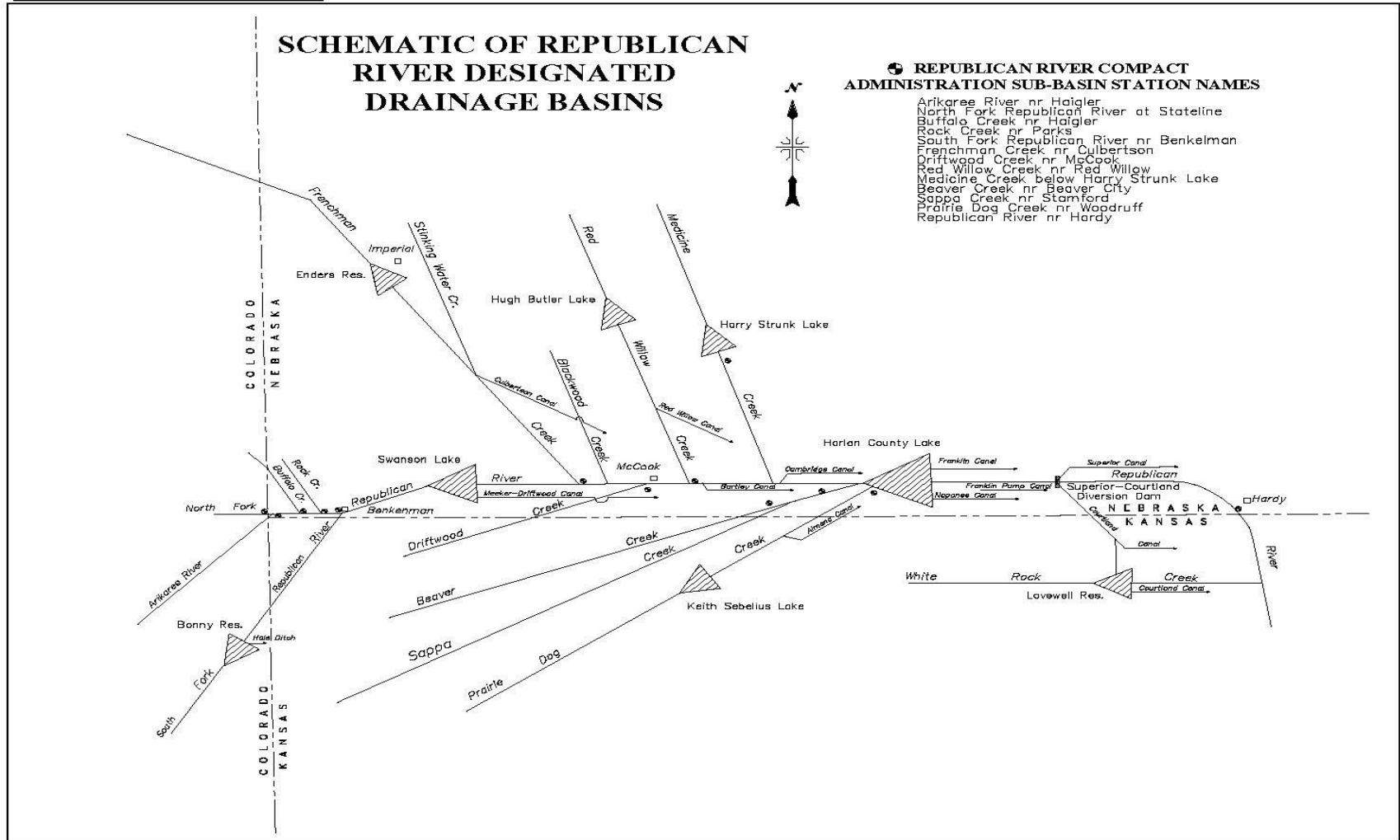
Nebraska								
Year	Allocation			Computed Beneficial Consumptive Use			Imported Water Supply Credit	Difference Between Allocation and the Computed Beneficial Consumptive Use offset by Imported Water Supply Credit Above Guide Rock
Column	Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8
	State Wide Allocation	Allocation below Guide Rock	State Wide Allocation above Guide Rock	State Wide CBCU	CBCU below Guide Rock	State Wide CBCU above Guide Rock	Credits above Guide Rock	Col 3 – (Col 6 – Col 7)
Previous Year								
Current Year								
Average								

Year	Allocation			Computed Beneficial Consumptive Use			Imported Water Supply Credit	Difference Between Allocation and the Computed Beneficial Consumptive Use offset by Imported Water Supply Credit Above Guide Rock
Column	Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8
	State Wide Allocation	Allocation below Guide Rock	State Wide Allocation above Guide Rock	State Wide CBCU	CBCU below Guide Rock	State Wide CBCU above Guide Rock	Credits above Guide Rock	Col 3 – (Col 6- Col 7)
Year = -2								
Year = -1								
Current Year								
Three-Year Average								
Sum of Previous Two-year Difference								
Expected Decrease in CBCU Under Plan								

Table 5E: Nebraska Tributary Compliance During Water-Short Year Administration

Year	Sum of Nebraska Sub-basin Allocations	Sum of Nebraska's Share of Sub-basin Unallocated Supplies	Total Available Water Supply for Nebraska	Computed Beneficial Consumptive Use	Imported Water Supply Credit	Difference between Allocation And the Computed Beneficial Consumptive Use offset by Imported Water Supply Credit
	Col 1	Col 2	Col 3	Col 4	Col 5	Col 6
Previous Year						Col 3 -(Col 4-Col 5)
Current Year						
Average						

Figure 2



Line Diagram of Designated Drainage Basins Showing Federal Reservoirs and Sub-basin Gaging Stations

Attachment 1: Sub-basin Flood Flow Thresholds

Sub-basin	Sub-basin Flood Flow Threshold Acre-feet per Year ³
Arikaree River	16,400
North Fork of Republican River	33,900
Buffalo Creek	4,800
Rock Creek	9,800
South Fork of Republican River	30,400
Frenchman Creek	51,900
Driftwood Creek	9,400
Red Willow Creek	15,100
Medicine Creek	55,100
Beaver Creek	13,900
Sappa Creek	26,900
Prairie Dog	15,700

³ Flows considered to be Flood Flows are flows in excess of the 94% flow based on a flood frequency analysis for the years 1971-2000. The Gaged Flows are measured after depletions by Beneficial Consumptive Use and change in reservoir storage.

Attachment 2: Description of the Consensus Plan for Harlan County Lake

The Consensus Plan for operating Harlan County Lake was conceived after extended discussions and negotiations between Reclamation and the Corps. The agreement shaped at these meetings provides for sharing the decreasing water supply into Harlan County Lake. The agreement provides a consistent procedure for: updating the reservoir elevation/storage relationship, sharing the reduced inflow and summer evaporation, and providing a January forecast of irrigation water available for the following summer.

During the interagency discussions the two agencies found agreement in the following areas:

- The operating plan would be based on current sediment accumulation in the irrigation pool and other zones of the project.
- Evaporation from the lake affects all the various lake uses in proportion to the amount of water in storage for each use.
- During drought conditions, some water for irrigation could be withdrawn from the sediment pool.
- Water shortage would be shared between the different beneficial uses of the project, including fish, wildlife, recreation and irrigation.

To incorporate these areas of agreement into an operation plan for Harlan County Lake, a mutually acceptable procedure addressing each of these items was negotiated and accepted by both agencies.

1. Sediment Accumulation.

The most recent sedimentation survey for Harlan County project was conducted in 1988, 37 years after lake began operation. Surveys were also performed in 1962 and 1972; however, conclusions reached after the 1988 survey indicate that the previous calculations are unreliable. The 1988 survey indicates that, since closure of the dam in 1951, the accumulated sediment is distributed in each of the designated pools as follows:

Flood Pool	2,387 Acre-feet
Irrigation Pool	4,853 Acre-feet
Sedimentation Pool	33,527 Acre-feet

To insure that the irrigation pool retained 150,000 Acre-feet of storage, the bottom of the irrigation pool was lowered to 1,932.4 feet, msl, after the 1988 survey.

To estimate sediment accumulation in the lake since 1988, we assumed similar conditions have occurred at the project during the past 11 years. Assuming a consistent rate of deposition since 1988, the irrigation pool has trapped an additional 1,430 Acre-feet.

A similar calculation of the flood control pool indicates that the flood control pool has captured an additional 704 Acre-feet for a total of 3,090 Acre-feet since construction.

The lake elevations separating the different pools must be adjusted to maintain a 150,000-acre-foot irrigation pool and a 500,000-acre-foot flood control pool. Adjusting these elevations results in the following new elevations for the respective pools (using the 1988 capacity tables).

Top of Irrigation Pool	1,945.70 feet, msl
Top of Sediment Pool	1,931.75 feet, msl

Due to the variability of sediment deposition, we have determined that the elevation capacity relationship should be updated to reflect current conditions. We will complete a new sedimentation survey of Harlan County Lake this summer, and new area capacity tables should be available by early next year. The new tables may alter the pool elevations achieved in the Consensus Plan for Harlan County Lake.

2. Summer Evaporation.

Evaporation from a lake is affected by many factors including vapor pressure, wind, solar radiation, and salinity of the water. Total water loss from the lake through evaporation is also affected by the size of the lake. When the lake is lower, the surface area is smaller and less water loss occurs. Evaporation at Harlan County Lake has been estimated since the lake's construction using a Weather Service Class A pan which is 4 feet in diameter and 10 inches deep. We and Reclamation have jointly reviewed this information and assumed future conditions to determine an equitable method of distributing the evaporation loss from the project between irrigation and the other purposes.

During those years when the irrigation purpose expected a summer water yield of 119,000 Acre-feet or more, it was determined that an adequate water supply existed and no sharing of evaporation was necessary. Therefore, evaporation evaluation focused on the lower pool elevations when water was scarce. Times of water shortage would also generally be times of higher evaporation rates from the lake.

Reclamation and we agreed that evaporation from the lake during the summer (June through September) would be distributed between the irrigation and sediment pools based on their relative percentage of the total storage at the time of evaporation. If the sediment pool held 75 percent of the total storage, it would be charged 75 percent of the evaporation. If the sediment pool held 50 percent of the total storage, it would be charged 50 percent of the evaporation. At the bottom of the irrigation pool (1,931.75 feet, msl) all of the evaporation would be charged to the sediment pool.

Due to downstream water rights for summer inflow, neither the irrigation nor the sediment pool is credited with summer inflow to the lake. The summer inflows would be

assumed passed through the lake to satisfy the water right holders. Therefore, Reclamation and we did not distribute the summer inflow between the project purposes.

As a result of numerous lake operation model computer runs by Reclamation, it became apparent that total evaporation from the project during the summer averaged about 25,000 Acre-feet during times of lower lake elevations. These same models showed that about 20 percent of the evaporation should be charged to the irrigation pool, based on percentage in storage during the summer months. About 20 percent of the total lake storage is in the irrigation pool when the lake is at elevation 1,935.0 feet, msl. As a result of the joint study, Reclamation and we agreed that the irrigation pool would be credited with 20,000 Acre-feet of water during times of drought to share the summer evaporation loss.

Reclamation and we further agreed that the sediment pool would be assumed full each year. In essence, if the actual pool elevation were below 1,931.75 feet, msl, in January, the irrigation pool would contain a negative storage for the purpose of calculating available water for irrigation, regardless of the prior year's summer evaporation from sediment storage.

3. Irrigation withdrawal from sediment storage.

During drought conditions, occasional withdrawal of water from the sediment pool for irrigation is necessary. Such action is contemplated in the Field Working Agreement and the Harlan County Lake Regulation Manual: "Until such time as sediment fully occupies the allocated reserve capacity, it will be used for irrigation and various conservation purposes, including public health, recreation, and fish and wildlife preservation."

To implement this concept into an operation plan for Harlan County Lake, Reclamation and we agreed to estimate the net spring inflow to Harlan County Lake. The estimated inflow would be used by the Reclamation to provide a firm projection of water available for irrigation during the next season.

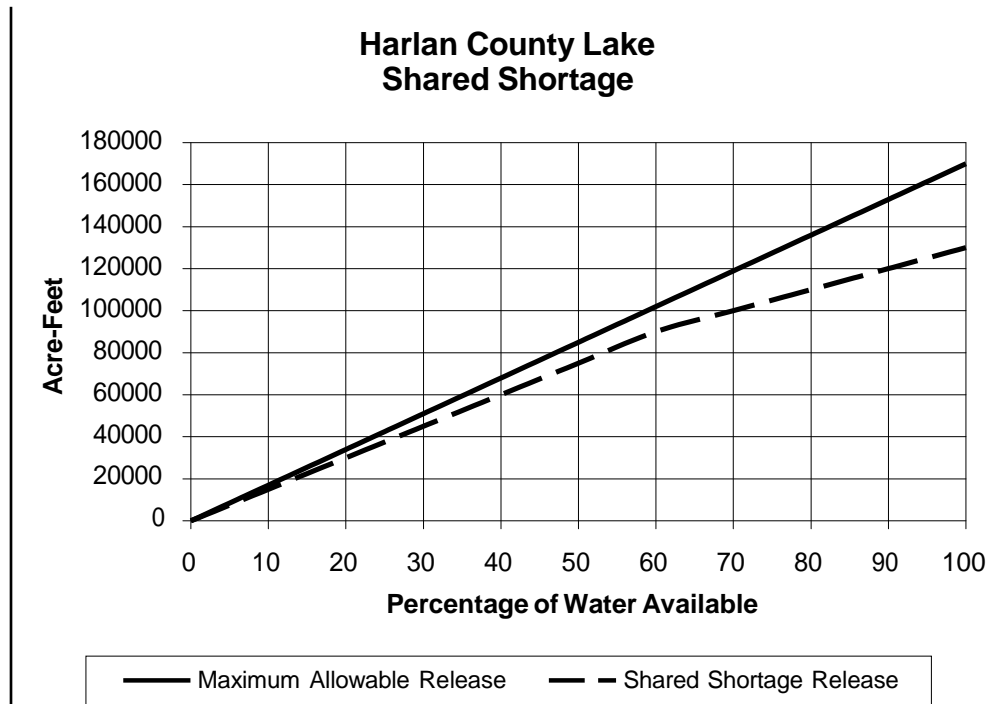
Since the construction of Harlan County Lake, inflows to the lake have been depleted by upstream irrigation wells and farming practices. Reclamation has recently completed an in-depth study of these depleted flows as a part of their contract renewal process. The study concluded that if the current conditions had existed in the basin since 1931, the average spring inflow to the project would have been 57,600 Acre-feet of water. The study further concluded that the evaporation would have been 8,800 Acre-feet of water during the same period. Reclamation and we agreed to use these values to calculate the net inflow to the project under the current conditions.

In addition, both agencies also recognized that the inflow to the project could continue to decrease with further upstream well development and water conservation farming. Due to these concerns, Reclamation and we determined that the previous 5-year inflow values would be averaged each year and compared to 57,600 Acre-feet. The inflow estimate for Harlan County Lake would be the smaller of these two values.

The estimated inflow amount would be used in January of each year to forecast the amount of water stored in the lake at the beginning of the irrigation season. Based on this forecast, the irrigation districts would be provided a firm estimate of the amount of water available for the next season. The actual storage in the lake on May 31 would be reviewed each year. When the actual water in storage is less than the January forecast, Reclamation may draw water from sediment storage to make up the difference.

4. Water Shortage Sharing.

A final component of the agreement involves a procedure for sharing the water available during times of shortage. Under the shared shortage procedure, the irrigation purpose of the project would remove less water than otherwise allowed and alleviate some of the adverse effects to the other purposes. The procedure would also extend the water supply during times of drought by “banking” some water for the next irrigation season. The following graph illustrates the shared shortage releases.



5. Calculation of Irrigation Water Available

Each January, the Reclamation would provide the Bostwick irrigation districts a firm estimate of the quantity of water available for the following season. The firm estimate of water available for irrigation would be calculated by using the following equation and shared shortage adjustment:

$$\text{Storage} + \text{Summer Sediment Pool Evaporation} + \text{Inflow} - \text{Spring Evaporation} = \text{Maximum Irrigation Water Available}$$

The variables in the equation are defined as:

- Maximum Irrigation Water Available. Maximum irrigation supply from Harlan County Lake for that irrigation season.
- Storage. Actual storage in the irrigation pool at the end of December. The sediment pool is assumed full. If the pool elevation is below the top of the sediment pool, a negative irrigation storage value would be used.
- Inflow. The inflow would be the smaller of the past 5-year average inflow to the project from January through May, or 57,600 Acre-feet.
- Spring Evaporation. Evaporation from the project would be 8,800 Acre-feet which is the average January through May evaporation.
- Summer Sediment Pool Evaporation. Summer evaporation from the sediment pool during June through September would be 20,000 Acre-feet. This is an estimate based on lower pool elevations, which characterize the times when it would be critical to the computations.

6. Shared Shortage Adjustment

To ensure that an equitable distribution of the available water occurs during short-term drought conditions, and provide for a “banking” procedure to increase the water stored for subsequent years, a shared shortage plan would be implemented. The maximum water available for irrigation according to the above equation would be reduced according to the following table. Linear interpolation of values will occur between table values.

Shared Shortage Adjustment Table

Irrigation Water Available (Acre-feet)	Irrigation Water Released (Acre-feet)
0	0
17,000	15,000
34,000	30,000
51,000	45,000
68,000	60,000
85,000	75,000
102,000	90,000
119,000	100,000
136,000	110,000
153,000	120,000
170,000	130,000

7. Annual Shutoff Elevation for Harlan County Lake

The annual shutoff elevation for Harlan County Lake would be estimated each January and finally established each June.

The annual shutoff elevation for irrigation releases will be estimated by Reclamation each January in the following manner:

1. Estimate the May 31 Irrigation Water Storage (IWS) (Maximum 150,000 Acre-feet) by taking the December 31 irrigation pool storage plus the January-May inflow estimate (57,600 Acre-feet or the average inflow for the last 5-year period, whichever is less) minus the January-May evaporation estimate (8,800 Acre-feet).
2. Calculate the estimated Irrigation Water Available, including all summer evaporation, by adding the Estimated Irrigation Water Storage (from item 1) to the estimated sediment pool summer evaporation (20,000 AF).
3. Use the above Shared Shortage Adjustment Table to determine the acceptable Irrigation Water Release from the Irrigation Water Available.
4. Subtract the Irrigation Water Release (from item 3) from the Estimated IWS (from item 1). The elevation of the lake corresponding to the resulting irrigation storage is the Estimated Shutoff Elevation. The shutoff elevation will not be below the bottom of the irrigation pool if over 119,000 AF of water is supplied to the districts, nor below 1,927.0 feet, msl. If the shutoff elevation is below the irrigation pool, the maximum irrigation release is 119,000 AF.

The annual shutoff elevation for irrigation releases would be finalized each June in accordance with the following procedure:

1. Compare the estimated May 31 IWS with the actual May 31 IWS.
2. If the actual end of May IWS is less than the estimated May IWS, lower the shutoff elevation to account for the reduced storage.
3. If the actual end of May IWS is equal to or greater than the estimated end of May IWS, the estimated shutoff elevation is the annual shutoff elevation.
4. The shutoff elevation will never be below elevation 1,927.0 feet, msl, and will not be below the bottom of the irrigation pool if more than 119,000 Acre-feet of water is supplied to the districts.

Attachment 3: Inflows to Harlan County Lake 1993 Level of Development

BASELINE RUN - 1993 LEVEL INFLOW TO HARLAN COUNTY RESERVOIR

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1931	10.2	10.8	13.4	5.0	18.8	15.8	4.3	1.8	1.8	0.0	0.1	0.1	82.1
1932	6.8	16.6	18.5	4.6	3.8	47.6	3.8	2.8	4.8	0.0	0.0	0.4	109.7
1933	0.4	0.0	3.9	30.2	31.0	5.4	1.8	0.0	10.4	0.0	2.6	5.5	91.2
1934	2.1	0.0	3.2	1.8	0.7	7.3	0.8	0.0	1.3	0.0	2.2	0.0	19.4
1935	0.3	0.1	0.7	4.2	0.8	389.3	6.1	19.1	26.1	2.4	5.2	0.9	455.2
1936	0.3	0.0	11.9	0.0	35.9	4.7	0.4	0.0	1.8	0.0	1.6	3.8	60.4
1937	4.8	12.9	6.0	2.5	0.0	12.6	6.3	6.9	2.4	0.0	0.0	12.4	66.8
1938	9.9	7.8	8.7	10.4	18.7	8.6	7.3	7.8	4.9	0.2	0.0	4.7	89.0
1939	2.7	7.5	9.6	12.2	6.6	13.3	5.0	4.1	0.0	0.0	0.0	0.0	61.0
1940	0.0	0.0	12.2	5.2	4.6	23.7	2.8	3.2	0.0	3.6	0.0	1.4	56.7
1941	0.0	10.6	10.6	7.7	17.2	67.1	28.9	19.7	14.9	8.3	6.7	7.1	198.8
1942	3.3	10.6	0.5	34.1	30.8	83.9	11.7	10.9	36.5	3.1	8.7	0.3	234.4
1943	1.2	11.2	14.6	31.4	4.7	28.3	4.8	0.3	0.9	0.0	0.0	11.8	109.2
1944	0.1	4.3	9.0	43.1	31.9	63.9	26.6	15.4	0.5	0.3	3.0	4.5	202.6
1945	4.3	7.8	5.7	9.5	4.1	53.5	5.0	0.9	1.5	5.0	6.0	6.3	109.6
1946	5.9	11.2	9.3	4.9	7.0	3.1	1.6	11.4	28.1	129.9	25.0	12.1	249.5
1947	1.1	3.2	10.4	8.2	11.9	195.4	22.3	5.9	2.9	0.2	0.3	0.3	262.1
1948	6.2	9.8	24.1	5.4	0.2	39.8	13.5	6.8	4.2	0.0	0.1	0.1	110.2
1949	2.0	1.5	25.2	16.3	49.0	57.4	9.2	5.5	2.1	3.0	2.8	0.3	174.3
1950	0.3	5.7	10.8	10.9	28.9	10.1	12.7	9.3	7.8	7.2	3.8	3.1	110.6
1951	3.8	3.4	7.1	5.3	42.0	39.9	42.1	10.1	36.0	15.5	14.8	8.9	228.9
1952	16.4	21.4	26.3	23.8	34.6	4.0	9.3	3.1	1.5	11.7	4.3	0.1	156.5
1953	1.8	4.6	5.3	3.3	15.1	9.5	1.8	0.2	0.0	0.0	2.8	0.1	44.5
1954	1.0	6.8	1.9	3.2	7.1	2.4	0.0	1.2	0.0	0.0	0.0	0.0	23.6
1955	0.0	4.0	6.3	4.8	2.9	6.4	2.7	0.0	1.4	0.0	0.0	0.0	28.5
1956	1.6	3.4	2.9	2.4	1.3	1.5	0.0	0.6	0.0	0.0	0.0	0.0	13.7
1957	0.0	4.1	6.2	12.8	3.5	62.4	21.3	1.2	2.0	3.4	4.5	4.7	126.1
1958	0.8	3.0	14.2	14.0	18.7	1.3	3.4	2.2	0.0	0.4	0.0	0.6	58.6
1959	1.9	15.4	16.4	8.5	13.6	4.2	1.4	1.2	0.0	4.3	1.0	4.5	72.4
1960	1.4	12.3	71.4	23.9	21.7	53.7	14.1	3.2	0.0	0.0	0.2	2.8	204.7
1961	2.3	6.4	7.7	7.4	26.5	24.0	7.2	4.9	0.0	2.3	4.8	1.7	95.2

Attachment 3: Inflows to Harlan County Lake 1993 Level of Development

BASELINE RUN - 1993 LEVEL INFLOW TO HARLAN COUNTY RESERVOIR

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1962	4.5	9.1	16.2	9.9	14.4	42.6	41.6	21.1	2.3	8.7	8.3	5.7	184.4
1963	3.4	18.2	18.2	15.0	12.7	14.7	3.4	6.1	8.7	0.8	5.3	1.8	108.3
1964	5.4	7.6	8.3	8.4	9.9	11.9	7.2	6.5	2.4	1.9	1.4	2.3	73.2
1965	6.0	8.1	11.1	12.8	32.8	40.0	22.9	6.5	37.2	53.7	19.5	11.0	261.6
1966	8.9	21.4	15.7	11.4	12.0	34.7	12.4	2.5	3.5	5.4	6.8	5.7	140.4
1967	7.2	11.5	11.5	12.9	9.1	75.3	43.7	15.3	4.4	7.3	6.9	5.4	210.5
1968	3.9	10.2	8.5	11.6	10.8	12.5	3.1	2.7	1.6	2.0	4.3	3.4	74.6
1969	4.2	10.8	24.5	15.1	18.9	17.5	17.0	12.6	16.6	9.2	11.8	9.9	168.1
1970	3.5	8.7	8.5	10.5	11.1	7.7	4.6	3.2	0.5	3.3	4.7	4.5	70.8
1971	4.1	10.3	12.4	12.8	18.3	7.2	8.4	6.2	1.9	4.2	7.3	7.1	100.2
1972	5.5	8.1	9.2	8.3	14.8	8.5	6.5	4.4	0.1	2.9	7.6	4.1	80.0
1973	11.4	14.2	19.0	16.2	17.4	20.9	9.1	1.9	8.4	19.6	11.9	13.2	163.2
1974	13.2	13.4	12.0	14.3	15.4	17.2	5.5	0.0	0.0	0.0	4.9	5.5	101.4
1975	7.2	8.2	13.6	14.8	12.0	48.1	11.6	7.4	0.1	3.0	6.2	7.3	139.5
1976	7.0	10.2	10.1	16.0	12.1	3.5	2.2	1.8	0.9	1.0	3.2	3.1	71.1
1977	4.4	9.6	12.9	21.2	31.5	12.1	5.9	1.9	10.6	4.1	5.5	5.3	125.0
1978	5.0	6.5	20.6	12.9	11.8	3.8	0.0	1.0	0.0	0.0	0.3	1.6	63.5
1979	1.3	7.6	21.5	18.8	15.9	5.4	10.4	10.6	1.6	0.9	3.6	6.2	103.8
1980	5.7	9.3	11.6	15.2	10.4	2.1	2.5	0.0	0.0	0.0	2.5	2.2	61.5
1981	5.5	6.0	11.6	14.9	22.5	6.4	11.5	16.3	4.3	2.5	6.7	6.2	114.4
1982	5.3	12.5	17.9	14.3	26.8	27.1	8.9	2.7	0.0	6.5	6.3	15.5	143.8
1983	6.5	9.7	27.2	16.4	41.4	74.2	10.7	7.6	3.8	3.1	6.7	5.2	212.5
1984	6.8	14.6	17.2	32.9	40.6	15.5	8.1	4.5	0.0	5.5	4.8	6.2	156.7
1985	6.9	14.1	13.6	11.9	27.4	9.9	10.0	2.0	6.0	8.5	5.6	5.8	121.7
1986	9.1	9.4	12.2	11.7	34.3	13.0	13.5	4.6	3.3	5.9	5.4	7.1	129.5
1987	5.9	9.2	19.7	24.1	24.3	11.7	19.0	5.7	2.3	2.7	8.2	7.0	139.8
1988	6.2	13.7	11.6	15.2	15.2	7.0	17.9	10.4	0.6	2.0	5.9	5.4	111.1
1989	5.4	5.9	10.5	9.1	11.4	11.8	14.0	6.2	0.2	3.1	3.1	3.5	84.2
1990	6.6	7.7	13.2	9.7	15.5	1.4	4.3	10.7	0.6	3.2	2.0	2.7	77.6
1991	2.4	8.0	9.0	10.6	15.2	3.9	1.9	0.5	0.0	0.0	2.7	4.8	59.0
1992	8.0	8.8	12.7	8.5	4.5	6.1	6.5	9.4	2.4	6.9	6.7	5.2	85.7
1993	5.2	14.4	71.6	22.7	21.0	17.0	68.0	37.5	23.3	16.8	30.1	17.7	345.3
Avg	4.5	8.8	14.1	13.0	17.2	30.6	11.0	6.2	5.4	6.3	5.0	4.7	126.8

BASELINE - 1993 LEVEL FLOWS - HARLAN COUNTY EVAPORATION

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1931	0.7	0.9	1.6	2.9	4.2	7.4	6.9	5.2	2.7	2.1	1.2	0.4	36.2
1932	0.6	0.8	1.5	2.7	4.1	5.0	6.8	5.0	2.7	2.1	1.2	0.4	32.9
1933	0.6	0.8	1.4	2.5	3.8	7.8	6.1	4.2	2.7	2.1	1.2	0.4	33.6
1934	0.6	0.8	1.4	2.4	4.5	6.5	8.0	6.2	2.7	2.0	1.2	0.4	36.7
1935	0.6	0.8	1.3	2.3	2.2	3.6	9.7	6.2	3.1	2.5	1.4	0.5	34.2
1936	0.7	0.9	1.6	2.9	5.5	6.8	8.7	6.5	2.7	2.1	1.2	0.4	40.0
1937	0.6	0.8	1.4	2.5	3.6	4.0	6.2	6.5	2.7	2.1	1.2	0.4	32.0
1938	0.6	0.9	1.5	2.7	3.4	4.9	6.5	5.7	2.7	2.1	1.2	0.4	32.6
1939	0.6	0.8	1.4	2.6	4.3	4.9	6.8	4.6	2.7	2.1	1.2	0.4	32.4
1940	0.6	0.8	1.4	2.4	3.5	5.0	6.5	4.6	2.7	2.1	1.2	0.4	31.2
1941	0.6	0.8	1.4	2.5	3.9	4.2	6.7	5.3	2.8	2.1	1.3	0.5	32.1
1942	0.6	0.9	1.5	2.8	4.0	5.2	8.3	5.1	3.2	2.5	1.5	0.5	36.1
1943	0.7	1.0	1.8	3.2	4.3	5.7	7.9	6.3	2.7	2.1	1.2	0.4	37.3
1944	0.6	0.8	1.4	2.7	4.2	5.3	7.0	5.8	3.5	2.6	1.5	0.5	35.9
1945	0.7	1.0	1.8	3.1	3.8	3.0	6.7	5.7	2.9	2.2	1.3	0.5	32.7
1946	0.6	0.9	1.6	2.8	3.5	5.1	5.6	4.4	2.9	2.7	1.8	0.6	32.5
1947	1.0	1.5	2.9	3.2	3.4	-1.2	5.8	5.3	3.7	1.7	0.5	0.1	27.9
1948	0.8	0.7	1.5	3.6	3.1	2.4	4.2	4.7	3.0	2.7	0.8	0.3	27.8
1949	0.1	0.9	0.7	1.8	1.1	0.7	6.5	4.1	3.1	1.7	1.5	0.4	22.6
1950	0.7	0.1	0.8	2.8	2.0	5.6	0.8	2.8	4.5	2.3	1.6	0.6	24.6
1951	0.5	0.2	2.1	0.7	-0.1	1.9	3.5	4.1	0.4	3.1	2.2	0.9	19.5
1952	1.1	1.2	1.9	2.5	5.2	6.2	1.5	3.4	3.6	2.9	1.1	-0.1	30.5
1953	0.5	1.0	1.5	2.9	4.7	4.5	4.6	6.6	5.3	3.3	0.1	0.0	35.0
1954	0.7	0.6	2.2	3.6	0.3	4.9	6.7	1.6	3.6	1.6	1.5	0.6	27.9
1955	0.5	1.0	2.1	4.6	3.4	-0.5	7.3	6.9	2.7	2.6	1.4	0.4	32.4
1956	0.6	1.1	1.9	2.8	3.9	4.5	5.0	3.7	4.7	3.7	1.3	0.5	33.7
1957	0.7	1.0	1.3	0.5	-0.6	-1.1	6.1	3.7	2.3	1.7	1.2	0.4	17.2
1958	0.7	0.1	1.0	0.6	2.3	4.4	1.0	1.9	3.3	3.3	1.0	0.6	20.2
1959	0.4	1.0	1.1	2.1	1.0	3.5	5.0	4.8	2.3	0.7	1.5	0.6	24.0
1960	0.1	0.7	2.0	2.7	0.9	0.1	4.9	3.6	3.9	2.0	1.3	0.4	22.6
1961	0.9	1.0	1.4	2.7	-1.1	0.6	5.1	2.9	1.2	2.4	0.7	0.1	17.9

Attachment 4: Evaporation Loss Harlan County Lake 1993 Level of Development

BASELINE - 1993 LEVEL FLOWS - HARLAN COUNTY EVAPORATION

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1962	0.6	0.6	0.9	3.7	3.4	1.5	0.3	1.6	2.0	2.0	1.7	0.3	18.6
1963	0.7	1.4	1.3	4.5	4.6	6.3	6.1	3.1	-0.8	2.7	1.5	0.4	31.8
1964	0.8	0.8	1.7	3.2	5.6	1.2	6.9	3.0	3.0	3.3	1.2	0.6	31.3
1965	0.4	0.7	1.2	2.8	1.5	-0.5	2.0	2.8	-3.9	1.7	2.1	0.4	11.2
1966	0.9	0.8	2.9	2.7	7.5	2.8	5.8	3.7	2.7	2.8	1.5	0.4	34.5
1967	0.7	1.2	2.5	3.0	2.0	-2.9	1.6	4.5	3.5	2.0	1.6	0.4	20.1
1968	0.9	1.2	2.8	2.6	3.2	4.9	4.7	1.8	2.3	0.7	1.2	0.2	26.5
1969	0.4	0.6	2.4	3.3	0.1	3.8	-0.7	2.9	2.2	-1.0	1.5	0.4	15.9
1970	0.7	1.4	2.3	2.8	4.7	4.4	6.5	5.9	0.9	1.0	1.5	0.7	32.8
1971	0.7	0.2	2.0	2.9	0.7	5.1	3.4	4.5	1.4	1.5	0.2	0.5	23.1
1972	0.8	1.3	2.0	1.7	1.1	0.0	3.3	1.8	2.1	1.7	-0.4	0.1	15.5
1973	0.5	1.1	-0.7	2.5	3.4	6.7	-1.7	4.2	-3.0	0.2	0.2	0.2	13.6
1974	0.7	1.5	2.6	1.5	3.7	2.5	9.1	2.6	3.4	1.4	1.1	0.3	30.4
1975	0.7	0.7	2.0	2.1	0.8	1.1	4.3	2.7	3.0	3.4	0.7	0.6	22.1
1976	0.8	1.2	1.7	0.7	1.5	5.0	5.9	5.7	-0.2	1.4	1.4	0.7	25.8
1977	0.7	1.3	0.2	1.1	0.0	4.6	4.0	0.6	2.0	1.6	1.0	0.4	17.5
1978	0.5	0.7	1.2	3.4	3.9	6.2	7.1	4.5	4.5	3.0	1.1	0.5	36.6
1979	0.5	0.6	1.1	3.9	4.4	4.6	3.5	5.1	4.1	2.8	1.4	0.7	32.7
1980	0.5	0.6	1.2	3.4	3.7	4.7	6.8	6.0	3.9	2.7	1.3	0.6	35.4
1981	0.5	0.6	1.2	3.8	3.2	4.8	4.2	3.7	2.9	1.7	1.3	0.7	28.6
1982	0.5	0.7	1.2	3.9	3.8	3.9	5.1	3.8	2.9	2.2	1.4	0.8	30.2
1983	0.5	0.7	1.4	2.9	4.2	5.3	8.6	7.2	4.6	1.8	1.5	0.6	39.3
1984	0.6	0.8	1.4	2.9	4.2	5.8	7.2	5.7	4.7	1.4	1.4	0.7	36.8
1985	0.5	0.7	1.3	2.3	4.0	4.5	5.6	3.5	3.8	1.5	1.5	0.7	29.9
1986	0.6	0.7	1.3	2.8	4.4	5.8	6.7	4.0	2.7	1.3	1.4	0.7	32.4
1987	0.5	0.8	1.3	3.1	4.2	6.2	6.9	3.5	3.1	2.2	1.4	0.7	33.9
1988	0.5	0.7	1.3	3.5	4.9	6.6	4.6	4.8	3.5	2.2	1.4	0.7	34.7
1989	0.5	0.7	1.2	4.2	4.5	4.4	4.8	3.6	3.0	2.5	1.4	0.7	31.5
1990	0.5	0.7	1.2	3.0	3.5	5.6	6.4	4.0	5.0	3.4	1.4	0.6	35.3
1991	0.5	0.7	1.2	2.8	3.3	5.5	6.0	5.0	5.1	3.2	1.3	0.6	35.2
1992	0.6	0.7	1.2	1.8	3.2	2.2	4.1	3.5	4.2	2.9	1.9	1.0	27.3
1993	0.6	0.5	1.0	2.2	3.1	4.6	4.2	4.9	4.5	4.4	3.1	1.2	34.3
Avg	0.6	0.8	1.5	2.7	3.2	3.9	5.3	4.3	2.8	2.2	1.3	0.5	29.1

Attachment 5: Projected Water Supply Spread Sheet Calculations

Trigger Calculations Based on Harlan County Lake Irrigation Supply	Units-1000 Acre-feet		Irrigation Trigger		119.0		Assume that during irrigation release season HCL Inflow = Evaporation Loss						
			Total Irrigation Supply		130.0								
			Bottom Irrigation		164.1								
			Evaporation Adjust		20.0								
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
1993 Level AVE inflow	6.3	5	4.7	4.5	8.8	14.1	13.0	17.2	30.6	11.0	6.2	5.4	126.8
1993 Level AVE evap (1931-93)	2.2	1.3	0.5	0.6	0.8	1.5	2.7	3.2	3.9	5.3	4.3	2.8	29.1
Avg. Inflow Last 5 Years	10.8	13.0	12.3	12.9	16.6	22.4	19.4	18.1	14.8	16.5	11.0	4.7	172.6

Year 2001-2002 Oct - Jun Trigger and Irrigation Supply Calculation									
Calculation Month	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Previous EOM Content	236.5	235.9	238.6	242.9	248.1	255.1	263.8	269.6	276.2
Inflow to May 31	73.6	67.3	62.3	57.6	53.1	44.3	30.2	17.2	0.0
Last 5 Yrs Avg Inflow to May 31	125.6	114.8	101.7	89.5	76.6	59.9	37.5	18.1	0.0
Evap to May 31	12.8	10.6	9.3	8.8	8.2	7.4	5.9	3.2	0.0
Est. Cont May 31	297.3	292.6	291.6	291.7	293.0	292.0	288.1	283.6	276.2
Est. Elevation May 31	1944.44	1944.08	1944.00	1944.01	1944.11	1944.03	1943.72	1943.37	1942.77
Max. Irrigation Available	153.2	148.5	147.5	147.6	148.9	147.9	144.0	139.5	132.1
Irrigation Release Est.	120.1	117.4	116.8	116.8	118.1	117.1	116.8	116.8	116.8
Trigger - Yes/No	NO	YES	YES	YES	YES	YES	YES	YES	YES
130 kAF Irrigation Supply - Yes/No	NO	NO	NO	NO	NO	NO	NO	NO	NO

Attachment 5: Projected Water Supply Spread Sheet Calculations

Year 2002 Jul - Sep Final Trigger and Total Irrigation Supply Calculation				
CalculationMonth		Jul	Aug	Sep
Previous EOM Irrigation Release Est.		116.8	116.0	109.7
Previous Month Inflow		5.5	0.5	1.3
Previous Month Evap		6.3	6.8	6.6
Irrigation Release Estimate		116.0	109.7	104.4
Final Trigger - Yes/No		YES		
130 kAF Irrigation Supply - Yes/No		NO	NO	NO

Attachment 6: Computing Water Supplies and Consumptive Use Above Guide Rock

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
Total Main Stem VWS	Hardy gage	Superior-Courtland Diversion Dam Gage	Courtland Canal Diversions	Superior Canal Diversions	Courtland Canal Returns	Superior Canal Returns	Total Bostwick Returns Below Guide Rock	NE CBCU Below Guide Rock	KS CBCU Below Guide Rock	Total CBCU Below Guide Rock	Gain Guide Rock to Hardy	VWS Guide Rock to Hardy	Main Stem Virgin Water Supply Above Guide Rock	Nebraska Main Stem Allocation Above Hardy	Kansas Main Stem Allocation Above Hardy	Nebraska Guide Rock to Hardy Allocation	Kansas Guide Rock to Hardy Allocation
							Col F+ Col G			Col I+ Col J	+ Col B - Col C+ Col K - Col H	+ Col L + Col K	Col A - Col M	.489 x Col N	.511 x Col N	.489 x Col M	.511 x Col M

Attachment 7: Calculations of Return Flows from Bureau of Reclamation Canals

Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8	Col 9	Col 10	Col 11	Col 12
Canal	Canal Diversion	Spill to Waste-way	Net Diversion	Field Deliveries	Canal Loss	Average Field Loss Factor	Field Loss	Total Loss from District	Percent field and Canal Loss That Returns to the Stream	Total return to Stream from Canal and Field Loss	Return as Percent of Canal Diversion
Name Canal	Headgate Diversion	Sum of measured spills to river	Col 2 - Col 3	Sum of deliveries to the field	Col 4 – Col 5	1 – Weighted Average Efficiency of Application System for the District*	Col 5 x Col 7	Col 6 + Col 8	Estimated Percent Loss*	Col 9 x Col 10 + Col 3	Col 11 / Col 2
∑ Irrigation Season											
∑ Non-Irrigation Season											
Example	100	5	95	60	35	30%	18	53	82%	48.46	48.5%
	100	5	95	0	95	30%	0	95	92%	87.4	87.4%
Culbertson						30%			82%		
						30%			92%		
Culbertson Extension						30%			82%		
						30%			92%		
Meeker - Driftwood						30%			82%		
						30%			92%		
Red Willow						30%			82%		
						30%			92%		
Bartley						30%			82%		
						30%			92%		
Cambridge						30%			82%		
						30%			92%		
Naponee						35%			82%		
						35%			92%		
Franklin						35%			82%		
						35%			92%		
Franklin Pump						35%			82%		
						35%			92%		
Almena						30%			82%		
Superior						31%			82%		
						31%			92%		
Nebraska Courtland						23%			82%		
Courtland Canal Above Lovewell (KS)						23%			82%		
Courtland Canal Below Lovewell						23%			82%		

*The average field efficiencies for each district and percent loss that returns to the stream may be reviewed and, if necessary, changed by the RRCA to improve the accuracy of the estimates.

RESOLUTION OF THE REPUBLICAN RIVER COMPACT ADMINISTRATION

REGARDING REQUIRED CHANGES TO THE RRCA ACCOUNTING PROCEDURES AND REPORTING REQUIREMENTS REGARDING NON-IRRIGATION SEASON CANAL DIVERSIONS FOR GROUNDWATER RECHARGE PURPOSES

Whereas, the States of Kansas, Nebraska, and Colorado entered into a Final Settlement Stipulation (“FSS”) as of December 15, 2002, to resolve pending litigation in the United States Supreme Court regarding the Republican River Compact (“Compact”) in the case of *Kansas v. Nebraska and Colorado*, no. 126 Original;

Whereas, the FSS was approved by the United States Supreme Court on May 19, 2003;

Whereas, by memorandum dated May 14, 2015 and provided at the quarterly RRCA Engineering Committee Meeting on that same date, the state of Nebraska introduced the reformed RRCA Accounting Procedures and Reporting Requirements regarding non-irrigation season canal recharge diversions and the estimated percent loss assigned to those diversions.

Whereas, the proposed changes to the RRCA Accounting Procedures and Reporting Requirements shall be enacted for the accounting years 2016 and forward.

NOW THEREFORE BE IT RESOLVED, the Republican River Compact Administration approves and adopts the proposal set forth in Nebraska’s May 14, 2015 memorandum, a copy of which is attached hereto as Exhibit A and incorporated as if the same were set forth fully herein with the exception of the following:

Provision: Non-irrigation season canal recharge diversions shall be limited to 10,000 acre-feet. If canal recharge diversions exceed 10,000 acre-feet, the method established for irrigation season canal diversions shall apply.

Approved by the Republican River compact Administration this 27th day of August, 2015.

Gordon W. Fassett, P.E.
Nebraska Member

Date

David Barfield, P.E.
Kansas Member

Date

Dick Wolfe, P.E.
Colorado Member

Date

RESOLUTION BY THE REPUBLICAN RIVER COMPACT ADMINISTRATION
APPROVING OPERATION AND ACCOUNTING FOR THE COLORADO COMPACT
COMPLIANCE PIPELINE AND COLORADO'S COMPLIANCE EFFORTS IN THE SOUTH
FORK REPUBLICAN RIVER BASIN

RECITALS

Whereas, the States of Kansas, Nebraska, and Colorado (each, a "State", and collectively, the "States") entered into a Final Settlement Stipulation ("FSS") as of December 15, 2002, to resolve pending litigation in the United States Supreme Court regarding the Republican River Compact ("Compact") in the case of *Kansas v. Nebraska and Colorado*, No. 126 Original;

Whereas, the FSS was approved by the United States Supreme Court on May 19, 2003;

Whereas, the State of Colorado's Computed Beneficial Consumptive Use of the waters of the Republican River Basin exceeded Colorado's Compact Allocation using the five-year running average to determine Compact compliance from 2003 through 2012, as provided in Subsection IV.D of the FSS;

Whereas, the Republican River Water Conservation District is a water conservation district created by Colorado statute to assist the State of Colorado to comply with the Compact;

Whereas, the Republican River Water Conservation District, acting by and through its Water Activity Enterprise ("RRWCD WAE"), has acquired fifteen wells ("Compact Compliance Wells") in the Republican River Basin in Colorado and has constructed collector pipelines, a storage tank, a main transmission pipeline, and an outlet structure capable of delivering groundwater to the North Fork of the Republican River for the sole purpose of offsetting stream depletions in order to comply with the State of Colorado's Compact Allocations;

Whereas, the RRWCD WAE has purchased groundwater rights in the Republican River Basin within Colorado and proposes to pump the historical consumptive use of some or all of these groundwater rights from the Compact Compliance Wells into the pipeline it has constructed and deliver that water into the North Fork of the Republican River near the Colorado/Nebraska state line to offset stream depletions in order to comply with Colorado's Compact Allocations (the "Colorado Compact Compliance Pipeline" or the "Pipeline");

Whereas, the States agreed to operate the Pipeline during 2014, 2015, and 2016 on certain terms. This Resolution does not affect accounting for those years;

Whereas, the States have now agreed to a long-term plan to operate the Pipeline on different terms, which are described below;

Whereas, Colorado, Kansas, and Nebraska wish to comply with their obligations under the Republican River Compact and believe the action described herein will assist the States in their continued efforts to meet those obligations while maximizing the beneficial use of the basin's water for their constituents;

Whereas, Kansas' water users in the South Fork sub-basin depend on stream flows for their livelihoods, and remain concerned about diminishing flows at the Colorado-Kansas state line;

Whereas, in addition to numerous other efforts to reduce consumption, Colorado has already removed from irrigation in the South Fork Republican River basin 23,838 acres;

Whereas, Colorado and Kansas share a belief that, by removing additional acres in the South Fork Republican River basin or otherwise reducing consumption as set forth herein, Colorado's consumption of water in the South Fork Republican River averaged over five years will be less than or equal to its sub-basin allocation plus half of the unallocated waters of the South Fork Republican River.

Now, therefore, it is hereby resolved that the RRCA approves operation and the related accounting procedures for the Colorado Compact Compliance Pipeline subject to the terms and conditions set forth herein, including in the Recitals set forth above, which are fully incorporated as part of the agreement between the States.

A. Colorado Compact Compliance Pipeline.

The operation of the Colorado Compact Compliance Pipeline is described below. The related changes to the RRCA Accounting Procedures and Reporting Requirements ("revised RRCA Accounting Procedures") are attached hereto as Exhibit 1. The Compact accounting will follow the terms and conditions described in this resolution and its exhibits. Beginning January 1, 2017, operation of the Pipeline and the related changes to the accounting procedures for the Pipeline is subject to the following terms and conditions:

1. The average annual historical consumptive use of the groundwater rights that will be diverted at the Compact Compliance Wells shall be the amounts determined by the Colorado Ground Water Commission pursuant to its rules and regulations, as shown on Exhibit 2.
2. Diversions from any individual Compact Compliance Well shall not exceed 2,500 acre-feet during any calendar year.
3. Diversions during any calendar year under the groundwater rights listed on Exhibit 2 and any additional groundwater rights approved for diversion through the Compact Compliance Wells shall not exceed the total average annual historical consumptive use of the rights, except that banking of groundwater shall be permitted in accordance with the rules and regulations of the Colorado Ground Water Commission, subject to the terms and conditions of this resolution.
4. Diversions from the Compact Compliance Wells shall be measured by totalizing flow meters in compliance with the Colorado State Engineer's rules and regulations for the measurement of groundwater diversions in the Republican River basin, and the measured groundwater pumping from such wells shall be included in the "base" run of the RRCA Groundwater Model in accordance with paragraph III.D.1 of the revised RRCA Accounting Procedures. Net depletions from the Colorado Compact Compliance Wells shall be computed by the RRCA Groundwater Model and included in Colorado's

Computed Beneficial Consumptive Use of groundwater pursuant to paragraph III.D.1 of the revised RRCA Accounting Procedures (See Exhibit 1).

5. Deliveries from the Colorado Compact Compliance Pipeline to the North Fork of the Republican River shall be measured by a Parshall flume or other measuring device located at the outlet structure. Authorized representatives of Kansas and Nebraska shall have the right to inspect the Parshall flume and other measurement devices for the Pipeline at any reasonable time upon notice to the RRWCD WAE.
6. The measured deliveries from the Colorado Compact Compliance Pipeline, to the extent they are in compliance with this resolution, shall offset stream depletions to the North Fork of the Republican River sub-basin on an acre-foot for acre-foot basis in accordance with the revised RRCA Accounting Procedures.
7. Unlike previous temporary approvals, under the plan described herein, the measured deliveries from the Colorado Compact Compliance Pipeline will not be added to the RRCA Groundwater Model. Instead, the Accounting would be performed as shown in the attached Exhibit 1. The measured outflow from the CCP will be called the Colorado North Fork Augmentation Water Supply (CCPAWS). The CCPAWS will be subtracted from the gaged flow at the North Fork Republican River at Colorado-Nebraska state line (USGS Gage 06823000) for purposes of calculating the Virgin Water Supply of the North Fork of Republican River in Colorado sub-basin.
8. The CCPAWS will then be added as a credit to Column 3 (Credits for Imported Water Supply) in Table 3A, 4A, and Table 5A to provide Colorado with a credit against Colorado's CBCU. The column headers in Tables 3A, 4A, and 5A will be modified to reflect that the Augmentation Water Supply is accounted for analogous to Imported Water Supply.
9. Colorado shall determine the Projected Augmentation Water Supply Delivery ("Projected Delivery") to estimate the volume of augmentation water that will be delivered from the Pipeline as provided below, and the RRWCD WAE shall make deliveries from the Pipeline as provided below:
 - A. Colorado will initially estimate the Projected Delivery required for each year based on the largest stream depletions to the North Fork of the Republican River sub-basin during the previous five years without Pipeline deliveries. The RRWCD WAE will begin deliveries from the Colorado Compact Compliance Pipeline each year based on the Projected Delivery and shall make a minimum delivery of 4,000 acre-feet per year as provided below.
 - B. Accounting for deliveries will start January 1.
 - C. The RRWCD WAE will begin deliveries from the Pipeline on or after January 1 and will make the minimum annual delivery of 4,000 acre-feet during the months of January, February, and March, unless such deliveries cannot be made due to operational conditions beyond the control of the RRWCD WAE. If the minimum annual delivery of 4,000 acre-feet cannot be made during the months of January, February and March due to such operational conditions, Colorado will consult with Nebraska and Kansas to schedule such deliveries later in the year.
 - D. Colorado will calculate and provide notice to the Kansas and Nebraska RRCA Members, by April 10, of the Projected Delivery as provided in paragraph 8.A of this resolution. Unless Colorado determines by April 10 that it will not be able to deliver additional required augmentation water in October through December,

Colorado shall stop deliveries at the end of March. If Colorado anticipates that deliveries in the months of November and December will not be sufficient to replace stream depletions to the North Fork of the Republican River for Compact compliance, Colorado will maximize deliveries first in January, then sequentially in the months of February, March, and April. Deliveries will be made in May only if there is reason to believe that additional deliveries in the months of October through December will not be sufficient to replace stream depletions to the North Fork of the Republican River for Compact compliance.

- E. Because the final accounting for determining Compact compliance is not done until after the compact year is completed and because Colorado's allocations and computed beneficial consumptive use are dependent upon such factors as runoff, the amount of pumping, precipitation and crop evapotranspiration, Colorado cannot know the precise amount of augmentation water that will be needed at the beginning of a calendar year. After the initial minimum delivery of 4,000 acre-feet, Colorado will collect preliminary data for Compact accounting for that year and, no later than September 10 of that year, will update the Projected Delivery required for the remainder of the year, less the initial minimum delivery of the 4,000 acre-feet that has already been delivered; but not to exceed the average annual historical consumptive use of the groundwater rights as shown on Exhibit 2.
 - F. After updating the Projected Delivery, as described above, if additional deliveries in excess of the initial delivery of 4,000 acre-feet are necessary to offset projected stream depletions to the North Fork of the Republican River, Colorado and the RRWCD WAE will maximize such additional deliveries first in the month of December, then November and October of that same year. If the total necessary additional deliveries cannot be made within those three months, Colorado will attempt to schedule those deliveries in April and May of the same year, or at such time so as to avoid, to the extent practicable, deliveries during the subject accounting year's irrigation season.
 - G. Colorado's shortage and Projected Delivery will be calculated in accordance with the FSS.
10. Augmentation credit for deliveries from the Pipeline to the North Fork of the Republican River shall be limited to offsetting stream depletions to the North Fork of the Republican River Colorado sub-basin for the purpose of determining Colorado's compliance with the sub-basin non-impairment requirement (Table 4A) and for calculating Colorado's five-year running average allocation and computed beneficial use for determining Compact compliance (Tables 3A and 5A).
 11. The approval of operation of the Pipeline and the related accounting procedures for the Pipeline shall not govern the approval of any future proposed augmentation plan and related accounting procedures submitted by the State of Colorado or any other State under Subsection III.B.1.k of the FSS.
 12. Colorado agrees to collect data related to pumping of Pipeline wells and delivery of water through the outfall structure of the Pipeline on at least a daily basis and provide such data to Kansas and Nebraska on a monthly basis; and by January 30 of each calendar year, will provide all spreadsheets and calculations related to the initial "Projected Delivery" of

augmentation water. Colorado will provide to Kansas and Nebraska all updates to that projection within one week of the completion of any update.

B. Bonny Reservoir

1. The States agree to collaborate between now and December 31, 2017 to develop options to maximize the use of Bonny Reservoir. Any proposed change to the accounting or modeling of Bonny Reservoir will require approval by the RRCA under the terms of the Final Settlement Stipulation.
2. Colorado agrees to work in good faith with the Bureau of Reclamation, Colorado Parks and Wildlife, and Republican River Water Conservation District to maintain the flow of water through Bonny Reservoir during the term of this Resolution.

C. Irrigation in South Fork Republican River basin

1. Utilizing the Conservation Reserve Enhancement Program or other voluntary programs, Colorado agrees to retire up to an additional 25,000 acres from irrigation in the South Fork Republican River basin. Of that amount, Colorado will retire at least 10,000 acres by 2022 and will retire the remaining 15,000 acres by December 31, 2027.
2. In the event Colorado cannot or will not retire 25,000 acres by December 31, 2027, it may submit to the other States for their approval a plan to reduce consumption within Colorado by other means.

D. Water Short Year Accounting

The States agree to collaborate between now and December 31, 2017 on how to resolve the Beaver Creek issue for all water-short years in which accounting has not been finally approved by the RRCA.

E. Use of the Unallocated Supply of the South Fork

The States agree that this Resolution does not affect any State's right to use the Unallocated Supply of the South Fork Republican River or any other sub-basin. Nor should this Resolution be used as evidence of any State's legal position regarding use of the Unallocated Supply and each State hereby reserves all legal arguments concerning their rights to the Unallocated Supply or pertaining to its use.

F. Disputes under this Agreement

The States agree to work in good faith to resolve any disputes over implementation or interpretation of this Agreement, prior to submitting those disputes to arbitration under the terms of the FSS.

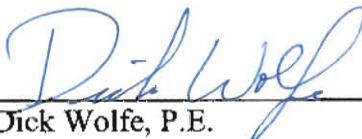
G. Term of Agreement

1. The terms of this Resolution remain in full force and effect until terminated by election of one or more States, which termination occurs on the following conditions:

- a. The terminating State must provide a written Notice of Intent to Terminate to the RRCA not later than October 1st of the year in which a State desires to issue a Notice;
 - b. The terms of the agreement remain in full force and effect through December 31st of the second full year following the RRCA's receipt of a Notice of Intent to Terminate.
2. The States agree in 2024 to review the terms of this Resolution and progress made under its terms.

H. Compliance Measure

The RRCA Commissioners hereby agree that compliance with this Resolution constitutes compliance with the Final Settlement Stipulation and Republican River Compact.



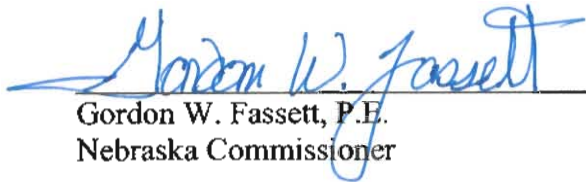
Dick Wolfe, P.E.
Colorado Commissioner
Chairman, RRCA

8/24/16
Date



David Barfield, P.E.
Kansas Commissioner

8/24/16
Date



Gordon W. Fassett, P.E.
Nebraska Commissioner

8/24/16
Date

**RESOLUTION APPROVING LONG-TERM AGREEMENTS
RELATED TO THE OPERATION OF HARLAN COUNTY LAKE
FOR COMPACT CALL YEARS**

August 24, 2016

Whereas, the States of Kansas, Nebraska, and Colorado (States) entered into a Final Settlement Stipulation (FSS), dated December 15, 2002, to resolve pending litigation in the United States Supreme Court regarding the Republican River Compact (Compact) in the case of *Kansas v. Nebraska and Colorado*, No. 126 Original; and

Whereas, the FSS was approved by the United States Supreme Court on May 19, 2003; and

Whereas, the States have previously determined and continue to hold that the Compact may be administered in a manner that increases flexibility for all water users, while remaining consistent with the terms of the Compact and the FSS; and

Whereas, the RRCA has previously enacted multiple resolutions to modify the operations of Harlan County Lake (HCL) and the RRCA Accounting Procedures for the years 2014, 2015, and 2016 to maximize the beneficial consumptive use of the waters of the Republican River Basin, and desires to establish a long-term agreement to implement similar modifications to Harlan County Lake operations and the RRCA Accounting Procedures to ensure the continued maximum beneficial consumptive use of the waters within the Basin; and

Whereas, the RRCA holds that *Project Water* means all water made up of flows of the Republican River basin, which may include flows resulting from water management actions, water rights administration and imported surface or groundwater supplies; and stored in Harlan County Lake for the benefit of water users in Kansas and/or Nebraska, pursuant to water right permits approved by the State of Nebraska.

Whereas, the intent of this Resolution is to build on the success of the prior Resolutions by establishing a process that applies during all Compact Call Years without the need for annual renewals.

NOW THEREFORE BE IT RESOLVED:

1. For this Resolution, the following definitions shall apply:
 - A. *Compact Call Year* means the calendar year that is designated by the State of Nebraska pursuant to its Republican River Basin Integrated Management Plans for Compact compliance activities, which may include augmentation, water rights administration, and other actions to effect Compact compliance.
 - B. *Compact Call Forecast Volume* means the amount of water that is identified through application of the forecasting methodology established in Nebraska's Republican River Basin Integrated Management Plans.
 - C. *Compact Compliance Volume* means the amount of water Nebraska would need to contribute to the natural flows of the Republican River Basin, for Kansas' exclusive use through augmentation activities, alone or in combination with other water management activities by the State of Nebraska, for purposes of ensuring Nebraska's Compact compliance.

- D. *Kansas Account* means an account that shall store all Project Water made available for the exclusive use by the Kansas Bostwick Irrigation District (KBID), and water supplies previously available to KBID under Warren Act Contract(s) existing as of the date of this Resolution.
- E. *Kansas Supplemental Account* means an account that shall store water supplies not in the Kansas Account and which shall be for use outside of KBID within the state of Kansas.
- F. *Remaining Compact Compliance Volume* means the portion of a previous year's Compact Compliance Volume retained for Kansas' use in a subsequent Compact Call Year subject to the conditions of Provisions 5 and 10.
2. Nebraska may supplement the natural flows of the Republican River Basin through augmentation discharges, alone or in combination with other water management activities beginning October 1 of the year preceding the year which is designated as a Compact Call Year and until such time as necessary to provide the Remaining Compact Compliance Volume, subject to the terms of Provision 5 and 10.
 3. Prior to October 1 of each Compact Call Year, Kansas and Nebraska shall meet to discuss the preliminary Compact Call Forecast Volume and the projected water supply available for irrigation within HCL for the upcoming year, and establish the portion of the Remaining Compact Compliance Volume that will be utilized to meet the conditions of Provisions 5 and 6.
 4. Nebraska shall establish, pursuant to the Integrated Management Plans, the Compact Call Forecast Volume no later than December 31 of each year.
 5. Nebraska shall make good faith efforts to ensure that, no later than June 1 of each Compact Call Year, the Kansas Account contains not less than the amount of water established by October 1 of the previous year as described in Provision 3 subject to Nebraska's operational capacity.
 6. Upon Kansas's request any portion of Remaining Compact Compliance Volume shall be administered to the Kansas Account or the Kansas Supplemental Account subject to Nebraska's operational capacity and Provision 3.
 7. Water in the Kansas Supplemental Account shall not be considered part of the Kansas Account for the purposes of Provision 5. Evaporation from water stored in the Kansas Supplemental Account shall be exclusively charged to Kansas.
 8. During Compact Call Years, Nebraska shall evaluate actual hydrologic conditions on a regular basis to estimate the Compact Compliance Volume. Beginning May 10 of each Compact Call Year, Nebraska shall provide the results of this estimate to Kansas and Colorado and to the United States not later than the tenth day of each month. Nebraska shall provide the other States the final Compact Compliance Volume no later than December 31 of each Compact Call Year.
 9. The accounting offset, equal to the final Compact Compliance Volume, for Nebraska's compliance operations shall be recorded in the "Imported Water Supply Credit" column of Nebraska's Table 3c and Table 5e and "Imported Water Supply Credit Above Guide Rock" column of Nebraska's Table 5c. The computed water supply will be reduced by the amount of augmentation water contributed to the natural flows of each respective

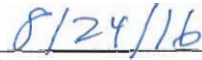
subbasin for the years in which the augmentation water contributions occur. Additionally, in the event that water contributed to the Kansas Account is not beneficially consumed within the year that it is provided, the Computed Water Supply will be adjusted as necessary to ensure that Nebraska receives full credit for the Compact Compliance Volume in that Compact Call Year. Subsequent release of water from the Kansas Account that was not beneficially consumed in a Compact Call Year, but for which Nebraska received full credit in a prior year, shall not increase the Computed Water Supply or allocation, and for purposes of Compact accounting shall be the last Project Water released from the Kansas Account.

10. Should the balance of the Remaining Compact Compliance Volume be greater than zero on January 1 of any year not designated as a Compact Call Year then the balance shall immediately be reduced by twenty-percent, and an equal volumetric reduction shall be applied to the balance of the Remaining Compact Compliance Volume on January 1 of each of the four subsequent years.
11. The compliance tests outlined in Tables 5A -- 5E shall not apply when, on or before June 30:
 - A. the sum of all waters available for irrigation from Harlan County Lake, the Remaining Compact Compliance Volume, and the volume in the Kansas Supplemental Account, is greater than or equal to 119,000 acre-feet; or
 - B. the sum of the Kansas Account and Kansas Supplemental Account is greater than or equal to 68,000 acre-feet.
12. The RRCA agrees that if a state is developing or considering a management strategy, including supplementing the basin's natural water supply that may impact the availability, usability or timing of the water supply of another state, that state will share the concepts of the management strategy with the other States.
13. The RRCA is committed to the establishment of water storage accounts for Kansas and Nebraska in HCL. The RRCA agrees to cooperate on working with the United States and the Nebraska Bostwick Irrigation District and the Kansas Bostwick Irrigation District (Districts) to establish these accounts.
14. The RRCA Commissioners hereby agree that compliance with this Resolution constitutes compliance with the Final Settlement Stipulation and Republican River Compact
15. Re-examination and Termination.
 - A. The States agree to re-examine the terms of this Resolution to ensure they are being implemented as intended and with the desired effect not later than April 1, 2020.
 - B. The terms of this Resolution shall remain in full force and effect until terminated by election of one or more States, which termination may be effectuated on the following conditions:
 - i. The terminating State must provide a written Notice of Intent to Terminate to the RRCA not later than October 1 of the year in which a State desires to issue a Notice;
 - ii. The terms of this Resolution shall remain in full force and effect through December 31 of the second full year following the RRCA's receipt of a Notice of Intent to Terminate.

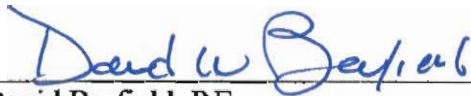
- iii. The States agree to work in good faith to resolve any disputes arising from the interpretation of this resolution.



Dick Wolfe, P.E.
Colorado Commissioner
Chairman, RRCA



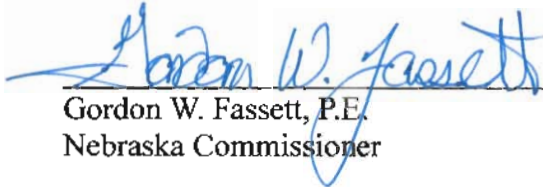
Date



David Barfield, P.E.
Kansas Commissioner



Date



Gordon W. Fassett, P.E.
Nebraska Commissioner



Date

**RESOLUTION BY THE REPUBLICAN RIVER WATER CONSERVATION DISTRICT
BOARD OF DIRECTORS REGARDING RESOLVING CERTAIN ISSUES BETWEEN
THE STATES OF KANSAS AND COLORADO REGARDING THE REPUBLICAN
RIVER COMPACT**

Resolution 16-02

WHEREAS, the Republican River Compact (“Compact”) allocated water for beneficial consumptive use in Colorado, Kansas, and Nebraska derived from the computed virgin water supply originating in designated drainage basins (referred to as sub-basins), the main stem of the Republican River and small tributaries thereof, and from water supplies of upstream basins otherwise unallocated; and,

WHEREAS, Colorado received allocations for beneficial consumptive use from the North Fork of the Republican River sub-basin, the Arikaree River sub-basin, the South Fork of the Republican River sub-basin, and the Beaver Creek sub-basin and, in addition, Colorado was allocated, for beneficial consumptive use, the entire water supply of the Frenchman Creek sub-basin in Colorado and the Red Willow Creek sub-basin in Colorado; and,

WHEREAS, the States of Kansas, Nebraska, and Colorado entered into a Final Settlement Stipulation (“FSS”) as of December 15, 2002, to resolve pending litigation in the United States Supreme Court regarding the Republican River Compact (“Compact”) in the case of *Kansas v. Nebraska and Colorado*, No. 126 Original; and,

WHEREAS, the FSS was approved by the United States Supreme Court on May 19, 2003;

WHEREAS, the Republican River Water Conservation District (“District”) was created pursuant to section 37-50-103(1), C.R.S.; and,

WHEREAS, the District was formed for the purpose of cooperating with and assisting the State of Colorado to carry out its duty to comply with the limitations and duties imposed upon the State by the Republican River Compact; and,

WHEREAS, Various disputes among the States have arisen since the FSS was adopted and the States have engaged in both litigation and negotiation in attempts to resolve those disputes and the District has supported the State of Colorado in its efforts to resolve these disputes on terms acceptable to the District and the State of Colorado; and,

WHEREAS, the District purchased groundwater rights and built a pipeline to deliver replacement water to the North Fork of the Republican River, has provided the local cost share to permanently or temporarily retire 49,500 previously irrigated acres within the District and has purchased various surface water rights on the tributaries of the Republican River, all to assist the State of Colorado in complying with the Compact; and,

WHEREAS, the District is a party to a confidentiality agreement with the States of Kansas, Nebraska, and Colorado; and,

WHEREAS, under the terms of that confidentiality agreement, the State of Colorado shared a draft RESOLUTION BY THE REPUBLICAN RIVER COMPACT ADMINISTRATION APPROVING AN AUGMENTATION PLAN AND RELATED ACCOUNTING PROCEDURES FOR THE COLORADO COMPACT COMPLIANCE PIPELINE AND SETTling ALL OTHER ISSUES BETWEEN COLORADO AND KANSAS UNDER THE REPUBLICAN RIVER COMPACT (“Settlement Resolution”) dated August 10, 2016; and,

WHEREAS, the Board of Directors of the District has discussed the Settlement Resolution; and,

WHEREAS, the Board of Directors hereafter states the terms under which it accepts the draft settlement resolution and its qualified support of the State of Colorado entering into such resolution;

NOW, THEREFORE, it is hereby resolved that:

1. The District understands that it is not and will not be a signatory to the Settlement Resolution or other settlement among the States and, therefore, there will not be a binding obligation on the District to perform any specific task or take any specific action required to comply with the Settlement Resolution; and,
2. The District will continue to fund the Republican River Conservation Reserve Enhancement Program (“CREP”) within the District boundaries in accordance with its statutory mandate to assist the State of Colorado in meeting the terms of the FSS and the goals listed in the Settlement Resolution, within the limitations of the District’s annual budget(s) and the conditions of the Republican River CREP; and,
3. The Republican River CREP is a voluntary program in which participation by any single or group of producers cannot be compelled and the District does not have any mechanism to force producers to enroll in the Republican River CREP; and,
4. The District will continue to cooperate with the State of Colorado to operate the Compact Compliance Pipeline, which the District constructed, in a manner that meets the agreements between the three States to the extent that it can do so within the constraints imposed by the operational approvals of the Sand Hills Ground Water Management District and the Colorado Groundwater Commission; and,
5. The District understands than any of the States may terminate the Settlement Resolution by filing a notice of intent to terminate in writing and that any RRCA resolution

addressing a specific storage pool in Harlan County Reservoir will contain the same termination provisions; and,

- 6. The District remains concerned that other, specific, issues that have a direct impact on the State of Colorado’s ability to comply with the Compact have not been resolved and urge the State of Colorado to continue to attempt to resolve those issues with terms that are acceptable to the State of Colorado and the District so as to allow the District long-term certainty as to Compact accounting; and,
- 7. The District may revoke this resolution and its support of a settlement if any final resolution adopted by the RRCA differs in any substantive way from the Settlement Resolution provided to the District or is in conflict with this Resolution.

ADOPTED this 23 day of August, 2016.

ATTEST

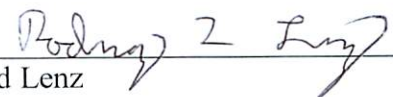
BOARD OF DIRECTORS

**REPUBLICAN RIVER WATER
CONSERVATION DISTRICT**

**Acting as the Governing Body of the
RRWCD Water Activity Enterprise**



 Tim Pautler
 Secretary



 Rod Lenz
 President

The 55th Annual Report of the Republican River Compact Administration is hereby approved by unanimous vote of the RRCA on this 21st day of August, 2018.

Kevin D. Rein DATE SIGNED: 8-21-18
Kevin Rein, Chairperson and Colorado Commissioner

Gordon W. Fassett DATE SIGNED: 8/21/18
Gordon W. "Jeff" Fassett, Nebraska Commissioner

David W. Barfield DATE SIGNED: 8/21/2018
David Barfield, Kansas Commissioner