

Republican River Compact Administration Annual Meeting

Binder for Nebraska Representatives Table of Contents

August 30-31, 2011
Burlington, Colorado
Burlington Community and Education Center

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- 14 - Republican River Compact Rules and Regulations
- 15 - RRCA Accounting Procedures and Reporting Requirements (Revised 8/12/2010)
- 16 - Final Settlement Stipulation

PROPOSED AGENDA FOR
RRCA WORK SESSION

Republican River Compact Administration

1:00 p.m. MST, August 30, 2011

Burlington Community and Education Center, Burlington Colorado

- 1) Introductions
- 2) Engineering Committee report and discussion
 - a) Accounting
 - i) Calendar Year 2010
 - (1) Draft final version of accounting spreadsheet (based on 2005 Accounting Procedures).
 - (2) Draft Engineering Committee report
 - ii) Status of Calendar Year 2006, 2007, 2008, & 2009 Accounting
 - iii) Status of Kansas data requests
 - b) Items discussed during prior meetings:
 - i) User Manual
 - ii) Proposed spreadsheet using five years of input data
 - iii) Recharge and Return Flow Methods
 - iv) Missing precipitation data
 - c) Propose that RRCA retain Principia Mathematica Contract for Maintenance and Operation of RRGWM during 2011
 - d) Other Business
 - i) Guide Rock gage
 - ii) Revised Bonny area-capacity tables
 - iii) Notice of petition for variance for Nebraska surface water permit
 - iv) Framework for future augmentation plans
 - e) Work Assignments and Follow Up Actions
- 3) Conservation Committee presentation and discussion
- 4) USBR WaterSmart program presentation and discussion
- 5) Adjourn

August 24, 2011

**Draft Agenda Republican River, WaterSMART Basin Study Discussion
During Republican River Compact Administration Work Session
Burlington CO
August 30, 2011 (100 pm MDT)**

- A. Purpose of Discussion
- B. Reclamation's WaterSMART Program (10 min)
 - a. Basin Study Program
 - b. Title XVI (Recycling/Reuse)
 - c. Water SMART Grants
 - d. Water Conservation Field Services Program
 - e. FY12 Funding Requests and Tentative Schedules
 - f. Examples
- C. Background, Lower Republican Basin Studies (5 min)
 - a. Basin Study Proposals from NE and KS
 - b. Reclamation's Response
- D. Plan of Study for Republican River Basin Study (15 min)
 - a. What is it and when is it needed
 - b. Sample draft/template
- E. Input from States (10 min)
- F. Next Steps (10 min)
 - a. MOU ?
 - b. Future Meeting?



United States Department of the Interior

BUREAU OF RECLAMATION
P.O. Box 25007
Denver, Colorado 80225-0007

IN REPLY REFER TO:

JUL 19 2011

84-51000
WTR-1.10

VIA ELECTRONIC MAIL

Mr. Tracy Streeter
Kansas Water Office
901 S. Kansas Avenue
Topeka, KS 66612

Subject: Fiscal Year (FY) 2011 Basin Studies Selection – *Republican River Basin Plan of Study*

Dear Mr. Streeter:

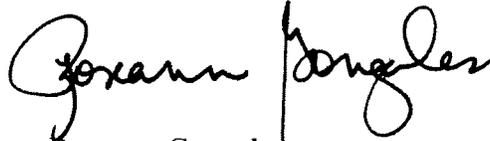
Thank you for your interest in the Bureau of Reclamation's FY 2011 Basin Study Program. Your proposal was evaluated along with a proposal by the Nebraska Department of Natural Resources and the Nebraska Republican River Management Districts Association (Nebraska) that also relates to Republican River Basin water issues. While both proposals had considerable merit, Reclamation determined that it would be inconsistent with the goals of the Basin Study Program to fund separate studies in the same basin, with the potential for multiple, overlapping issues. In the alternative, Reclamation will make \$100,000 in Federal funding available to support the development of a joint Plan of Study by Kansas and Nebraska, with input from Colorado. Mike Ryan, Regional Director, Great Plains Region, concurs with this decision.

A combined Plan of Study would support collaboration and avoid the potential for inconsistent or conflicting outcomes, which would better achieve the objectives of the Basin Study Program and the language of the Republican River Compact (Compact) and Final Settlement Stipulation of 2003. The development of a Plan of Study could serve as the basis for a joint FY 2012 proposal for a Republican River Basin Study. The Plan of Study would include opportunities for collaboration among all three parties to the Compact, including Kansas, Nebraska, and Colorado. The \$100,000 in Federal funding would support costs incurred by Reclamation or any contractors hired by Reclamation to develop a joint Plan of Study. A 50 percent non-Federal cost-share match, consisting of cash or in-kind services, will be required from the non-Federal participants, for example, \$50,000 from Kansas and \$50,000 from Nebraska.

Mr. Kip Gjerde, the Great Plains Regional Basin Study Coordinator, will contact your office shortly to discuss your interest in moving forward with the development of a Memorandum of Agreement for a Plan of Study. We look forward to working with you and the States of Nebraska and Colorado to assist in addressing the critical water issues in the Republican River Basin.

If you have any questions regarding the selection process, please contact Mr. Gjerde at (406)-247-7750 or jgjerde@usbr.gov.

Sincerely,



Roseann Gonzales
Director, Policy and Administration

cc: Dick Wolfe, P.E.
State Engineer,
Director, Colorado Division of Water Resources
1313 Sherman Street, Suite 818
Denver, CO 80203
dick.wolfe@state.co.us

David W. Barfield, P.E.
Chief Engineer
Kansas Department of Agriculture
Division of Water Resources
109 SW 9th Street, 2nd Floor
Topeka, Kansas 66612-1283
david.barfield@kda.ks.gov

Mr. Brian P. Dunnigan, P.E.
Director
Nebraska Department of Natural Resources
301 Centennial Mall South
Lincoln, NE 68509
brian.dunnigan@nebraska.gov

Mike Ryan,
Regional Director, Great Plains Region
Bureau of Reclamation
316 North 26th
Billings, MT 59101
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Denver, Colorado 80225-0007

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VIA ELECTRONIC MAIL

Mr. Brian P. Dunnigan, P.E.
Director, Nebraska Department of Natural Resources
301 Centennial Mall South
Lincoln, NE 68509

Subject: Fiscal Year (FY) 2011 Basin Studies Selection – *Republican River Basin Plan of Study*

Dear Mr. Dunnigan:

Thank you for your interest in the Bureau of Reclamation's FY 2011 Basin Study Program. Your proposal was evaluated along with a proposal by the Kansas Water Office and Kansas Department of Agriculture (Kansas) that also relates to Republican River Basin water issues. While both proposals had considerable merit, Reclamation determined that it would be inconsistent with the goals of the Basin Study Program to fund separate studies in the same basin, with the potential for multiple, overlapping issues. In the alternative, Reclamation will make \$100,000 in Federal funding available to support the development of a joint Plan of Study by Kansas and Nebraska, with input from Colorado. Mike Ryan, Regional Director, Great Plains Region, concurs with this decision.

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Sincerely,



Roseann Gonzales
Director, Policy and Administration

cc: Dick Wolfe, P.E.
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PROPOSED AGENDA FOR
**51TH ANNUAL MEETING OF THE
REPUBLICAN RIVER COMPACT ADMINISTRATION**

August 31, 2011, 9:00 AM MST
Burlington Community and Education Center, Burlington, Colorado

1. Introductions
2. Adoption of the Agenda
3. Status of Report and Transcript for August 12, 2010 Annual Meeting
4. Status of Previous Annual and Special Meetings Reports and Transcripts from 2008 and 2009
5. Report of Chairman and Commissioner's Reports
 - a. Colorado
 - b. Nebraska
 - c. Kansas
6. Federal Reports
 - a. Bureau of Reclamation
 - b. U.S. Army Corps of Engineers
 - c. U.S. Geological Survey
7. Committee Reports
 - a. Engineering Committee
 - i. Assignments from 2010 Annual Meeting
 - ii. Committee Recommendations to RRCA
 - iii. Other Matters
 - iv. Recommended assignments for Engineering Committee
 - b. Conservation Committee
8. Old Business
 - a. Status of 2006, 2007, 2008 and 2009 Final Accounting
9. New Business and Assignments to Compact Committees
 - a. Action on Engineering Committee Report and assignments
10. Remarks from the Public
11. Future Meeting Arrangements
12. Adjournment

AGENDA FOR
**50TH ANNUAL MEETING OF THE
REPUBLICAN RIVER COMPACT ADMINISTRATION**

August 12, 2010, 9:00 AM MST
Burlington Community and Education Center, Burlington, Colorado

1. Introductions
2. Modification and Adoption of the Agenda
3. Approval of Previous Annual and Special Meetings Reports and Transcripts from 2008 and 2009
4. Report of Chairman and Commissioner's Reports
 - a. Nebraska
 - b. Colorado
 - c. Kansas
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 2009 Annual Meeting
 - ii. Committee Recommendations to RRCA
 - iii. Other Matters
 - iv. Recommended assignments for Engineering Committee
 - v. Response to Kansas data requests
 - b. Conservation Committee
7. Old Business
 - a. Status of Dispute Resolution
 - b. Status of 2006, 2007 and 2008 Final Accounting
 - c. Status of RRCA regulation regarding the approval of a diversion in one state that is used in another state
 - d. Status of the Lower Republican River Feasibility Study
8. New Business and Assignments to Compact Committees
 - a. Action on Engineering Committee Report and assignments
 - b. Additional Items
 - i. Resolution for Lee Rolfs
9. Remarks from the Public
10. Future Meeting Arrangements
11. Adjournment

50TH ANNUAL MEETING OF THE
REPUBLICAN RIVER COMPACT ADMINISTRATION

AUGUST 12, 2010

9:15 A.M.

Burlington Community and Education Center
Burlington, Colorado

PANELS:
FOR COLORADO:
Commissioner Dick Wolfe
Mr. Peter Ampe
Ms. Megan Sullivan

FOR KANSAS:
Commissioner David Barfield
Mr. Burke Griggs
Mr. Chris Grunewald
Mr. Scott Ross
Mr. Chris Beightel

FOR NEBRASKA:
Commissioner Brian Dunnigan
Mr. Justin Lavene
Mr. Jim Schneider
Mr. Tom O'Connor

1 Department of Agriculture. And to my left is Scott
2 Ross. He's water commissioner for our Stockton Field
3 Office that covers all of northwest Kansas, and he's our
4 engineering committee lead. And then Chris Beightel is
5 our program manager for Water Management Services.

6 COMMISSIONER WOLFE: Commissioner?

7 COMMISSIONER DUNNIGAN: Thank you,
8 Commissioner Wolfe.

9 My name is Brian Dunnigan, and I'm the
10 director of the Nebraska Department of Natural
11 Resources.

12 And with me at the table today from
13 Nebraska, to my immediate left, Justin Lavene from the
14 attorney general's office; Jim Schneider, deputy
15 director; and Tom O'Connor.

16 Thank you.

17 COMMISSIONER WOLFE: Thank you.

18 Just a couple other procedural things.

19 There's copies of the agenda on the table when you came
20 in. If you didn't get one, they should be back there.

21 And there's refreshments in the back, some doughnuts and
22 coffee you're welcome to, so please help yourself to
23 those. And if you haven't found the restrooms already,
24 you go out these doors here, go down to your left and
25 again to the left, down to the next hallway and those

1 PROCEEDINGS

2 * * *

3 COMMISSIONER WOLFE: Good morning,
4 everyone. I'm Dick Wolfe, State Engineer for Colorado
5 and Compact Commissioner for Colorado for the Republican
6 River Compact Administration. Welcome to Burlington.

7 At this time, I'd like to introduce some of
8 the staff members here at the table that are from
9 Colorado with me. To my immediate right is Mr. Peter
10 Ampe. He's First Assistant Attorney General at the
11 Colorado State Attorney General's Office. And to my
12 left is Megan Sullivan, who is the engineer advisor for
13 Colorado.

14 David, do you want to go ahead and
15 introduce your staff here at the table for Kansas?

16 COMMISSIONER BARFIELD: Yes. Thank you,
17 Dick.

18 Again, thank you for hosting the meeting.
19 With me -- my name, for the record, is Dave Barfield.
20 I'm chief engineer for the Kansas Division of Water
21 Resources and Commissioner for the State of Kansas to
22 the Administration.

23 At the table here to my right is Chris
24 Grunewald, attorney with the -- for the Kansas Attorney
25 General's Office. Burke Griggs, an attorney with the

1 will be there.

2 We also have a court reporter here today
3 recording this for transcription. And as we go through
4 and make introductions, I'm going to, at this next step,
5 allow folks in the audience to introduce themselves.
6 And we'll pass around the mike, and so we'll make sure
7 that the court reporter hears those as well.

8 So my deputy, Mike Sullivan, over here to
9 the left, is here with me as well. And we're going to
10 start there, and we'll just pass this mike around so we
11 can hear everyone.

12 So, Mike, take it away.

13 MR. SULLIVAN: I'm Mike Sullivan with the
14 Colorado Division of Water Resources.

15 MR. MILLER: John Miller with the U.S.
16 Geological Survey out of North Platte, Nebraska.

17 MR. BOOK: Dale Book, consultant for the
18 State of Kansas.

19 MR. PERKINS: Sam Perkins, Division of Water
20 Resources, Kansas.

21 MR. KESTER: Paul Kester, Department of
22 Natural Resources, Nebraska.

23 MR. STANTON: Shane Stanton, and I'm a
24 field office manager for the State of Nebraska in
25 Cambridge.

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1 MR. BRADLEY: Jesse Bradley with the
2 Nebraska Department of Natural Resources.
3 MR. KEPLER: Jason Kepler with the Nebraska
4 Department of Natural Resources.
5 MR. EDGERTON: Brad Edgerton. I'm manager
6 of Frenchman-Cambridge Irrigation District.
7 MR. CLEMENTS: Mike Clements, manager, Lower
8 Republican NRD in Alma, Nebraska.
9 MR. CRAMER: Dale Cramer, former president
10 of Frenchman-Cambridge Irrigation District.
11 MR. DELKA: Mike Delka, manager of the
12 Bostwick Irrigation District in Nebraska.
13 MS. JURICEK: Chelsea Juricek, the Stockton
14 Field Office, for Kansas Division of Water Resources.
15 MR. VAN NOSTRAND: John Van Nostrand,
16 manager of the Burlington Record.
17 MR. MURPHY: Stan Murphy, the general
18 manager for the Republican River Water Conservation
19 District in Colorado.
20 MR. GUENTHNER: Scott Guentner with the
21 Bureau of Reclamation out of our regional office in
22 Billings.
23 MR. ERGER: Patrick Erger from the Bureau
24 of Reclamation out of the Billings office in the
25 regional office.

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1 MR. SWANDA: Marv Swanda with the Bureau of
2 Reclamation out of the McCook Field Office, McCook,
3 Nebraska.
4 MR. THOMPSON: Aaron Thompson, the area
5 manager for the Bureau of Reclamation Nebraska-Kansas
6 Office.
7 MR. SMITH: Dan Smith, manager of Middle
8 Republican Natural Resources District, in Curtis,
9 Nebraska.
10 MR. FANNING: Jasper Fanning, manager of the
11 Upper Republican Natural Resources District.
12 MR. PARKER: Edward Parker, with the Corps
13 of Engineers at Kansas City.
14 MR. EISENACH: Bob Eisenach, board member
15 of Hitchcock and Red Willow County Irrigation District.
16 MR. KOTSCHWAR: Jerry Kotschwar, Frenchman
17 Valley Irrigation District.
18 MR. ALBERT: Kenneth Albert, the director
19 of Frenchman Valley Irrigation District in Culbertson,
20 Nebraska.
21 MR. FELKER: Don Felker, manager of
22 Frenchman Valley/H&RW, Nebraska.
23 MR. KEELER: Dave Keeler, Republican River
24 in Colorado.
25 MR. RIDNOUR: Devin Ridnour, Republican

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1 River in Colorado.
2 MS. DANIEL: Deb Daniel, Plains and East
3 Cheyenne Ground Water Districts in Colorado.
4 MR. DINNEL: Dirk Dinnel, assistant
5 manager, Upper Republican NRD.
6 MR. RILEY: Tom Riley with the Flatwater
7 Group.
8 MR. KOELLIKER: Jim Koelliker, Kansas State
9 University, Manhattan.
10 MR. MARTIN: I'm Derrel Martin, University
11 of Nebraska at Lincoln.
12 MS. HOMM: Diane Homm, the Homm Ranch.
13 MR. BLANCA: I'm Don Blanca. I'm outside
14 legal counsel for Nebraska.
15 MR. POWERS: Marcus Powers, Nebraska
16 Attorney General's Office.
17 MS. BERNHARDT: Autumn Bernhardt, Colorado
18 Attorney General's Office.
19 MR. SULLIVAN: In the back, which helped us
20 put this meeting together, is Katie Radke with the
21 Colorado Division of Water Resources.
22 COMMISSIONER WOLFE: Thank you all.
23 Also, too, to help us out and also help the
24 reporter, make sure you've signed in the sign-in sheet.
25 If you haven't done that, if you'll make sure you get

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1 that signed in before you leave today, we would
2 appreciate it.
3 At this time, we're going to move on to
4 Agenda Item 3 -- excuse me, 2. We do have a couple of
5 modifications to the agenda. The first one is, on
6 Agenda Item 3, instead of approval of the previous
7 annual and special meeting reports, that will just be a
8 status.
9 The other addition to the agenda will be
10 under Item 8, Subitem (c). This is an addition, and
11 this will be a motion to dissolve the ad hoc legal
12 committee.
13 Commissioners, are there any other
14 amendments to the agenda at this time?
15 COMMISSIONER BARFIELD: Well, I guess I
16 would move that we adopt the agenda as you've
17 recommended we amend.
18 COMMISSIONER DUNNIGAN: Second.
19 COMMISSIONER WOLFE: All right. All those
20 in favor signify by saying aye.
21 COMMISSIONER DUNNIGAN: Aye.
22 COMMISSIONER BARFIELD: Aye.
23 COMMISSIONER WOLFE: Motion approved.
24 All right. We're on to Agenda Item No. 3.
25 This in regards to the status of the previous annual and

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1 special meeting reports and transcripts from 2008 and
 2 '9.
 3 Those have been now provided to the states
 4 for review, but due to the time constraints, we have not
 5 collectively had an opportunity to review all of those
 6 and making appropriate modifications to those two years.
 7 So it's anticipated that this will be taken up for
 8 future action at the -- what we anticipate, the next
 9 special meeting we'll talk about under Agenda Item 10.
 10 And that will allow each of the states an opportunity to
 11 review those and seek approval of those, hopefully, at
 12 that next meeting.
 13 So if there's any other special remarks,
 14 Commissioners, that you would like to make in regards to
 15 those two years for the record, I would be happy to do
 16 that at this time.
 17 COMMISSIONER BARFIELD: No.
 18 COMMISSIONER DUNNIGAN: No.
 19 COMMISSIONER WOLFE: No? All right. Thank
 20 you.
 21 All right. At this time, we're on Agenda
 22 Item No. 4. Commissioner Dunnigan?
 23 COMMISSIONER DUNNIGAN: Thank you,
 24 Chairman Wolfe.
 25 I'm pleased again this year to inform all

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1 of you that the State of Nebraska is in compliance with
 2 the Republican River Compact. Using current accounting
 3 procedures, Nebraska has a positive five-year average
 4 for the period ending in 2009.
 5 Based on preliminary estimates, it appears
 6 that Nebraska will again be in compliance for the
 7 five-year compliance period ending in 2010. This is a
 8 testament to the work conducted to date in partnership
 9 with Nebraska's Natural Resources Districts, its surface
 10 water users and the people of the Republican River
 11 Basin.
 12 In the future, Nebraska will continue to
 13 remain in compliance with the Republican River Compact.
 14 The primary NRDs, in partnership with the Department of
 15 Natural Resources, have revised the Integrated
 16 Management Plans that have been in place for 2 1/2
 17 years.
 18 These IMPs are working. Among other
 19 things, the IMPs clearly state that each of the NRDs
 20 cannot deplete more than their share of the water in the
 21 basin. This is not merely a goal, but rather a
 22 requirement of each plan.
 23 I've previously stated the Department and
 24 the Natural Resources Districts feel that it is
 25 important to investigate other options and further

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1 regulations that can be incorporated in the future plans
 2 addressing water-short years.
 3 In the first week of August, the State of
 4 Nebraska, along with the Upper and Middle Republican
 5 Natural Resources Districts, successfully adopted
 6 revisions to the existing Integrated Management Plans.
 7 These revisions address the concerns of long-term
 8 compliance brought up during the 2008 arbitration.
 9 The revised plans now contain an in-depth
 10 monitoring plan, including a comprehensive forecasting
 11 mechanism that allows Nebraska to look ahead and
 12 anticipate compliance issues, rather than waiting until
 13 six months after a year is over to see the results of
 14 Compact accounting.
 15 This forecast is designed to predict the
 16 compliance outcome for Nebraska if dry conditions are
 17 experienced in the upcoming year and accurately predicts
 18 when those potential dry conditions would require
 19 additional actions by Nebraska to remain in compliance.
 20 The revised plans contain a detailed
 21 description of the triggers that will indicate when
 22 additional management actions are needed. The
 23 responsibility for the needed management actions depend
 24 on the current situation in each NRD and those NRDs,
 25 with a share of any projected shortfall, will be

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1 required to implement the necessary controls that will
 2 ensure Nebraska's compliance in dry periods.
 3 Finally, the plans also provide for an
 4 occupation tax in these NRDs and the additional
 5 framework for Nebraska to continue to manage consumptive
 6 use over the long-term to meet Compact compliance.
 7 During the first half of this year, the
 8 States of Colorado, Kansas and Nebraska spent
 9 considerable time and effort to address concerns related
 10 to the Colorado Compliance Pipeline and Nebraska's
 11 crediting issued through the arbitration process.
 12 We consider both of these issues to be of
 13 importance and look forward to their resolution.
 14 The Department has also held meetings with
 15 the Bureau of Reclamation to address their
 16 misunderstandings of the revised IMPs, and we have made
 17 considerable progress in the last two weeks.
 18 In order for Nebraska to utilize its
 19 Compact allocation to the benefit of the entire basin,
 20 we will need to work closely with both surface and
 21 groundwater users to develop conjunctive management
 22 strategies that benefit all users.
 23 We will continue to see improvements over
 24 time as the IMPs continue to take hold. It is our
 25 belief that a healthy surface water system will

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1 contribute to Nebraska's ability to comply with the
2 Compact. Conjunctive management studies that identify
3 the best uses of those streamflow supplies during wet
4 and dry conditions will further enhance Nebraska's
5 ability to fully utilize its Compact allocation while
6 also continuing to ensure Compact compliance.
7 The Natural Resources Districts, the
8 Irrigation Districts, and their respective boards, and
9 the Bureau of Reclamation will play an important role in
10 implementing these strategies in a basin.
11 The future also holds continuing
12 participation in Conservation Reserve Enhancement
13 Program and the Environmental Quality Incentive Program
14 and other incentive-based management strategies.
15 Nebraska continues to explore stream
16 augmentation options. Vegetation management has
17 increased streamflow and the capacity of the stream
18 channel.
19 Nebraska will continue to take an active
20 role in the Engineering Committee and will always work
21 with the other states to improve existing accounting
22 methods and ensure they accurately reflect water use in
23 the basin.
24 In closing, I wish to assure all of you, as
25 well as my counterparts from our neighboring states,

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1 that Nebraska will continue to comply with the
2 Republican River Compact. The State will continue to
3 evaluate needs of the basin and make changes as
4 necessary to stay in compliance in the spirit of
5 openness, transparency and partnership.
6 We expect to continue to work with all
7 stakeholders in the basin, including the other states,
8 the NRDs, the surface water districts, and individual
9 users and the Bureau of Reclamation. Noncompliance is
10 not an option for the State of Nebraska.
11 I will now have Tom O'Connor give the
12 report of water administration activities in Nebraska
13 for calendar year 2009.
14 Tom?
15 MR. O'CONNOR: Thank you.
16 In January 2009, 53 letters were sent to
17 irrigators reminding them -- in the Republican River
18 Basin, reminding them the 2008 water use reports must be
19 filed with the Cambridge field office.
20 In February, 15 closing notices were issued
21 to those water users that failed to submit the required
22 annual water use reports. These water users were not
23 allowed to divert water during the 2009 calendar year.
24 June 24, one pumping schedule was sent to a
25 water user. June 26, a regulating notice was sent to a

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1 water user. June 29, 17 closing notices were issued to
2 water users above Meeker-Driftwood Canal. June 29, one
3 regulating notice was sent.
4 July 6, the regulating notice was sent and
5 also eight closing notices were issued to water users
6 above the Red Willow Canal. On July 8, 26 regulating
7 notices were sent to water users above Cambridge Canal,
8 and 30 closing notices were issued to water users above
9 Cambridge and Meeker-Driftwood Canal. July 9, 16
10 closing notices were issued to storage permit holders
11 above Harry Strunk Lake. And July 16, 31 written
12 negative notices were sent to water users above
13 Cambridge Canal.
14 August 6, four regulating notices were sent
15 to Frenchman-Cambridge, Frenchman Valley and H&RW
16 Irrigation Districts. And also 18 closing notices were
17 issued to water users above Bartley and Red Willow
18 Canal. On August 26 to the 31st, 36 regulating notices
19 were sent to water users above Bartley, Red Willow and
20 Meeker-Driftwood Canals.
21 September 10, one opening notice was sent
22 to a storage permit holder.
23 November 2, two opening notices were sent
24 to storage permit holders. November 18, letters were
25 sent to junior permit holders downstream in Harlan

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1 County Reservoir, stating that the U.S. Bureau of
2 Reclamation's prediction that 2010 will not be a
3 water-short year.
4 And November 18, water use report forms
5 were sent out to all private water use permit holders in
6 the Republican River Basin.
7 Thank you.
8 COMMISSIONER DUNNIGAN: That concludes
9 Nebraska's report. Thank you.
10 COMMISSIONER WOLFE: All right. Thank you
11 so much. Those are great reports.
12 At this time, I'll report on behalf of
13 Colorado.
14 And although I can't report today that
15 Colorado is in compliance with the Compact, we have
16 certainly made what we believe are great strides in
17 trying to reach compliance.
18 And we certainly couldn't have done it
19 without all of the great people that helped me in
20 accomplishing that. My staff included is here today,
21 our staff members here in the basin that introduced
22 themselves, the water users in the basins, the
23 Republican River Water Conservation District, and the
24 respective groundwater management districts have all
25 been working in a collaborative effort to assist

1 Colorado to reach compliance.
 2 And even though we have not reached
 3 compliance to date, there have been a tremendous amount
 4 of effort and costs for projects and so forth to soon
 5 get us there.
 6 And I also appreciate the efforts by both
 7 the States of Kansas and Nebraska in those discussions
 8 and collaborative efforts that we've undertaken over the
 9 past year, and even as of last night, in trying to reach
 10 resolution on Colorado's Compact Compliance Pipeline,
 11 which is obviously our major component for Colorado to
 12 achieve Compact compliance. So we do greatly appreciate
 13 all of those efforts and support that folks have given
 14 us to reach that end.
 15 We did have a couple other folks who --
 16 from Colorado I saw that kind of snuck in here at the
 17 end. Mr. David Robbins, who's legal counsel for the
 18 Republican River Water Conservation District, and also
 19 Dennis Coryell, who is the president of the Republican
 20 River Water Conservation District. So thank you for
 21 being here today.
 22 I'd like to just provide a quick snapshot
 23 of the -- some of the major hydrologic conditions of
 24 2009 as far as Colorado's portion goes, and then touch
 25 on some of the efforts that we have done in terms of

1 approximately 35 percent full with an active storage, as
 2 of last week, of 14,328 acre-feet.
 3 In 2009, we made a number of releases from
 4 Bonny Reservoir: In May of 2009, 884 acre-feet; in
 5 June 1,048; and in December, 1632 acre-feet. And in
 6 regards to the December releases, I appreciate the
 7 Bureau's efforts. We had waited until that timeframe to
 8 make those releases and your cooperation -- certainly
 9 with the holidays approaching at that time, we
 10 appreciate the cooperation from the Bureau in their
 11 efforts to assist in those releases. Those total
 12 releases for those three periods were 3,554 acre-feet.
 13 We're currently releasing from Bonny based
 14 on an order that I issued on July 9, due to -- this
 15 release was precipitated by heavy rainstorm events at
 16 the beginning of July that stalled over the area,
 17 ultimately raising the level of the reservoir to 17,771
 18 acre-feet.
 19 The releases, as of last month, have
 20 lowered the storage in Bonny Reservoir to
 21 approximately -- the releases have amounted to about
 22 3400 acre-feet to date.
 23 Next I'd like to just touch on some of the
 24 efforts that Colorado, in cooperation with the
 25 Republican River Water Conservation District and the

1 achieving Compact compliance, and then I'll turn it over
 2 to Kansas for their report.
 3 As far as the North Fork on the Republican
 4 River, in 2009 we had 24,410 acre-feet pass the
 5 state-line gage. This is approximately 6200 acre-feet
 6 less than the 1935 to 2009 average annual flow of 30,630
 7 acre-feet.
 8 On the Arikaree, streamflows at the
 9 Arikaree River gage at Haigler totaled 780 acre-feet for
 10 2009, about half the amount recorded for 2008, which
 11 totaled 1570 acre-feet. Flows on the Arikaree have
 12 declined significantly from the average of 12,450
 13 acre-feet for the period of 1933 to 2009.
 14 On the South Fork of the Republican River,
 15 a total of 8,487 acre-feet passed the Benkelman gage in
 16 2009. This is six times the total of 1420 acre-feet
 17 that passed the gage in 2008 and 12 times the total of
 18 2007. As you can see by that, streamflows on the South
 19 Fork continue to improve from the drought years of zero
 20 flow, but are still significantly lower than the 71-year
 21 average of 26,020 acre-feet.
 22 Bonny Reservoir is located on the South
 23 Fork of the Republican River, just north of Burlington
 24 here. It is the only Federal reservoir in Colorado's
 25 Republican River Basin. Bonny Reservoir is

1 other water users in the basin, have taken to continue
 2 to achieve Compact compliance.
 3 As I just reported, as far as the South
 4 Fork, we're continuing to make releases from Bonny
 5 Reservoir to reduce our evaporation and seepage charges
 6 on the South Fork. And we'll continue to do so in our
 7 efforts to achieve, not only our statewide compliance,
 8 but also our requirement under the Sub-Basin
 9 Non-Impairment Test.
 10 The Republican River Water Conservation
 11 District has been very active since 2006 in regards to
 12 the CREP and the EQIP programs. My understanding,
 13 through 2009, that there's been a little over
 14 19,600 acres that have been currently retired under the
 15 CREP program, a little over 10,700 acres under EQIP, and
 16 approximately 830 acres under AWEP, which is the
 17 continued version of EQIP, and there's approximately
 18 still 10,000 acres still available under the 2006 CREP
 19 program.
 20 There's also a CREP amendment that's being
 21 considered in Colorado. We're now in the EA process,
 22 and it's my understanding that will add up to -- I think
 23 up to 25,000 acres. It's either 20- or 25,000 acres,
 24 but I think it's potentially up to 25,000 acres. If
 25 I've got that wrong, I'll correct that. But a total

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1 between those two programs of 55,000 acres over that
2 period, and -- in the upcoming year.
3 The District still continues to make
4 surface water purchases, both on the North Fork and the
5 South Fork of the Republican River. Those efforts have
6 led to a result that there's very little surface water
7 irrigation left in the basin, and I know the District is
8 still continuing efforts to acquire water rights and
9 retire those surface water rights and reduce our
10 consumptive use associated with irrigation on those
11 lands.
12 The other effort that has been undertaken
13 by the State is in regards to the measurement rules that
14 I adopted, promulgated in 2008. First year effectively
15 in operation was 2009, was the first year of
16 administration underneath those new rules.
17 And by March 1 of 2009, all the high
18 capacity wells, which is approximately 4,000 wells in
19 the Basin, had to have a measurement device installed
20 and verified by a certified tester or be declared
21 inactive.
22 And by December 1 of this -- of 2009,
23 pumping totals for the irrigation year for all active
24 wells had to have been submitted to the State Engineer,
25 and we have received those reports and that information

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1 is currently being analyzed.
2 Last year, I reported that four new
3 positions were created for the well measurement program
4 in Compact compliance efforts, but two positions had
5 remained unfilled. This year, we now have -- the
6 measurement team is fully staffed and actively enforcing
7 the measurement rules in well permits in the Basin.
8 Lastly, I'd like to just mention some new
9 legislation that was adopted in Colorado. Again, it
10 applies statewide and is applicable in terms of our
11 enforcement efforts, not only in the Republican River
12 Basin, but throughout the state. They enacted a
13 provision that allows us to assess violations for -- or
14 fines, excuse me, for violations of orders of the State
15 Engineer for surface water violations.
16 We had a provision that was already in
17 place to assess that \$500-a-day fine for groundwater
18 violations, but that now applies also to surface water
19 violations. And it has helped Colorado in its efforts
20 to receive timely enforcement on those violations.
21 And that's all I have to report, so I'll
22 turn it over to Commissioner Barfield.
23 COMMISSIONER BARFIELD: Thank you,
24 Chairman Wolfe, and I'll provide a report for the State
25 of Kansas.

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1 I would -- actually, before I go on to my
2 report, I just want to note for the record, I guess, two
3 different things related to the -- sort of anniversaries
4 that maybe the Compact should recognize.
5 First of all, May 30 of this year marked
6 the 75th anniversary of the devastating 1935 Republican
7 River flood. That flood had a profound impact on all
8 three states, including the subsequent development of
9 the Federal flood control reservoirs, you know, that
10 were implemented via the Republican River Compact of
11 1943.
12 So, actually, also, I think this meeting
13 marks the 50th anniversary -- or the 50th annual meeting
14 of this Administration, so maybe we should have done a
15 little more to celebrate. But we've been around a while
16 working.
17 I would note, getting into Kansas' report,
18 that Kansas is fully in compliance with all tests of
19 compliance under the Final Settlement Stipulation, as
20 we've been since the adoption of the FSS. We are also
21 now fully metered within the Republican River Basin, and
22 all of the meters have been inspected.
23 So climate conditions, I guess, and things
24 have improved quite a bit over recent years, I think, in
25 all the states. Precipitation in Kansas this year is

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1 generally good. There are some areas of shortage, but
2 in the Republican in northwest Kansas, they're having
3 another good year. Our streamflows and reservoir levels
4 statewide are currently normal or above normal through
5 most of the state.
6 I'd just like to say a few words for the
7 record about our budget. Kansas State Government -- I
8 think all state governments share this predicament --
9 has experienced some significant shortfalls of --
10 totaling about a billion short of what has been
11 experienced, requiring some pretty significant
12 reductions in our activities.
13 My staff is about a quarter -- has about a
14 quarter fewer positions -- well, it has about a quarter
15 of its positions vacant at this time and about 1.1
16 million less funding than just a couple years ago,
17 requiring reductions in some of our services that people
18 find important.
19 Legislation, I guess, I typically give a
20 brief report in terms of some of the most significant
21 water legislation. Fortunately, it was a relatively
22 quiet year for the water legislation. That's usually
23 not a bad thing.
24 In reduction of service, I had to
25 discontinue a pretty popular program called the Water

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1 Right Conservation Program that allowed people to have a
2 contract between themselves and the chief engineer to
3 temporarily, up to ten years, not use their water right,
4 but prevent being subject to abandonment under the Water
5 Appropriation Act. That was a discretionary sort of
6 program that we eliminated, so there is a fair amount of
7 legislation to try and find ways to remedy that problem.
8 And Senate Bill 316 was enacted, that if --
9 that allowed if you're in closed area that -- and
10 maintain your diversion work, that that would be
11 considered doing sufficient cause for nonuse.
12 There's also significant activity under
13 Senate Bill 510 that essentially would create a new
14 beneficial use called conservation use, where a water
15 right holder would want to put it in conservation use
16 and essentially maintain it for the future and not be
17 subject to abandonment. That was not enacted, but I
18 think we'll be hearing more about that in the next
19 session.
20 There was also some activity related to dam
21 safety. We had to eliminate a couple positions that
22 were granted to us to do safety inspections of dams.
23 It's a requirement of the dam owner.
24 We were funded to do those inspections on
25 their behalf. The funding for those positions was not

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1 there. We eliminated our service to them, meaning they
2 had to do the inspections, and so there was some
3 legislation to try and take away the requirements for
4 them to inspect their dams.
5 That did not pass. We have a committee
6 working to sort of work through that issue.
7 In regard to regulations, I have enacted or
8 in process of enacting a number of significant changes
9 to our rules and regulations related to water
10 administration. Again, I mentioned the Water Right
11 Conservation Program was suspended.
12 There's a special process under a Kansas
13 statute called Intensive Groundwater Use Control Areas,
14 or IGUCAs, as we called them. We really never had any
15 regulations related to how IGUCAs would be -- the
16 hearings would be conducted, and I established a fairly
17 extensive set of regulations that outline those
18 procedures for these special hearing processes and to
19 require the periodic review of all existing IGUCAs over
20 the coming years.
21 I'm also in the process of developing a
22 significant set of regulations on impairment
23 investigations, where a water right holder claims that
24 another water right holder is impairing them.
25 We've had regulations dealing with this and

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1 doing impairment investigations and surface water
2 systems quite regularly in the past and actions. We've
3 had increasing calls of impairment in groundwater
4 systems, and this set of regulations essentially lays
5 out how we conduct an impairment investigation and
6 actions in groundwater systems, which is much more
7 complex, and how the groundwater management districts
8 are a part of that process. Those regulations are close
9 to adoption.
10 I might say a few words about the other
11 interstate river compacts, and particularly the
12 Republican River Compact; we frequently report on that.
13 And I reported last year that that litigation on the
14 Arkansas River that was initiated in 1985 was concluded
15 last year when the States of Kansas and Colorado agreed
16 on some updates to the Colorado Use Rules. And the two
17 states jointly filed a motion with the Supreme Court to
18 conclude that litigation, so we're -- I think we're all
19 pleased about that.
20 In February of this year, the two states,
21 the Compact Administration updated its 1980 Operating
22 Plan to reflect the numerous agreements the two states
23 had negotiated over recent years.
24 State Engineer Dick Wolfe here has
25 initiated a response to some of Kansas's concerns about

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1 surface water improvements in the Basin and their
2 potential effect on Compact compliance, and he's in the
3 process of developing some regulations on that issue
4 responsive to those concerns, and we appreciate those
5 activities.
6 And recently -- in recent months, we've
7 asked the Compact Administration, pursuant to the
8 decree, to consider an update to the
9 Hydrologic-Institutional Model related to groundwater
10 irrigation return flow changes.
11 With respect to specific activities within
12 the Republican Basin in Kansas, our groundwater --
13 Northwest Kansas Groundwater Management District No. 4
14 covers much of the northwest Kansas part of the
15 Republican Basin. Last month, it was announced that
16 that GMD receive an award for an Agricultural Water
17 Enhancement Program, or AWEP, a grant from the USDA
18 NRCS.
19 So the \$2.6 million grant will allow them
20 to convert irrigated acreage to non-irrigated land in
21 their six designated high priority areas.
22 I'm also working closely with GMD 4 in
23 those high priority areas. They are looking for ways to
24 reduce their groundwater use in some of the areas that
25 are overappropriated, and specifically we are looking at

1 finding ways to allow those reductions to occur through
2 the modification of their management programs and rules
3 jointly developed between the GMD and ourselves.

4 So we're actually going to have a rule
5 moving forward to test whether that process will -- you
6 know, will be able to be legally defended.

7 There are ways to do those kind of
8 allocations through the IGUCA provisions that I
9 mentioned a few minutes ago. The GMD would like to find
10 a way to do it through another process, so we're working
11 with them on that.

12 I would note for the record again that in
13 regard to some of the Republican River matters, that
14 Kansas submitted a motion for leave to file a petition
15 and brief in support with the U.S. Supreme Court
16 regarding Nebraska's noncompliance during water-short
17 year 2006.

18 This was among the disputes that the --
19 that were submitted to the RRCA in early 2008, submitted
20 to nonbinding arbitration in late 2008, and that were
21 concluded -- and that arbitration was concluded in
22 August of 2009. Kansas submitted its motion on May 3,
23 2010. Nebraska and Colorado replied in early July 2010.

24 As of this meeting, it's my understanding
25 that there has been no word from the Court as to whether

1 both disputes were held in the federal courthouse in
2 Kansas City, Kansas. The Arbitrator Pagel heard the
3 evidence in the Colorado Pipeline Compliance dispute in
4 July -- on July 12 and 13 and in the Nebraska crediting
5 proposal on July 14.

6 The States filed post trial briefs for the
7 Arbitrator Pagel on July 30, 2010. She will issue a
8 final decision on both disputes not later than
9 September 30, 2010.

10 The States will have until November 1, 2010
11 to give notice if the arbitrator's decision is
12 acceptable or rejected.

13 I guess I'd like to give a bit of a
14 response to you-all's reports. First, in regard to
15 Mr. Dunnigan's report, I guess Kansas agrees that
16 compliance is not an option and is a requirement. I
17 guess we have serious concerns whether the current plan
18 of the Integrated Management Plans will accomplish what
19 you assert in the future and fully address the concerns
20 that we have had.

21 We just received the two IMPs and are just
22 in the middle of conducting our review. As I understand
23 it, they build on the past IMPs and add new surface
24 water administration during Compact call years and the
25 potential for additional groundwater regulation during

1 it intends to take the case. Presumably, the Court will
2 make that determination later this year or possibly next
3 year.

4 The Supreme Court motion was submitted
5 under Kansas v. Nebraska, Colorado, No. 106 Original --
6 126, excuse me. The Supreme Court motion was submitted
7 under Kansas v. Nebraska, Colorado, No. 126 Original.

8 Later this year, the States will conclude
9 two more arbitrations. There's some reference to that
10 in Mr. Dunnigan's report. The first arbitration
11 concerned Nebraska's augmentation proposal, and the
12 second, Nebraska's crediting proposal.

13 As you will recall, both proposals were
14 voted upon by the RRCA in Lincoln. The RRCA did not
15 adopt either proposal. Consequently, both Colorado and
16 Nebraska initiated nonbinding arbitration proceedings
17 pursuant to the FSS.

18 The States retained Ms. Martha Pagel as
19 partner -- a partner in Schwabe, Williamson & Wyatt of
20 Portland, Oregon to arbitrate both disputes.

21 On May 5, 2010, Arbitrator Pagel heard oral
22 arguments in Portland regarding legal motions filed by
23 the states. She ruled on those motions on May 17, 2010.

24 The States concluded -- conducted limited
25 discovery in June and July. The arbitration trials for

1 those periods.

2 As you know, Brian, I and the Kansas
3 experts have reviewed and provided testimonies in the
4 2009 arbitration on the IMPs -- regarding the second
5 generation of IMPs and found that they have been
6 sufficient during critical periods when this Compact
7 must work and the arbitrator agreed with that.

8 Again, while we haven't completed any
9 comprehensive review yet, from what we know, we --
10 serious concerns remain. They don't appear to bring the
11 kind of certainty that Kansas expects with regard to
12 future compliance during, again, the critical periods
13 that this Compact must work.

14 You know, the IMP pumping reductions start
15 from one of the highest, if not the highest, five-year
16 groundwater pumping periods of record, which is
17 substantially higher than normal. So the IMP's pumping
18 reductions must be viewed in that historic comment --
19 context.

20 Irrigation requirements via CREP, while
21 welcome, are not permanent in Nebraska as they are in
22 Colorado and Kansas, and thus will lead to potential
23 problems in the future as some of that may come back to
24 irrigation.

25 From everything we know about the future,

1 Nebraska's groundwater depletions will continue to go up
2 even under these IMPs, at least I haven't seen anything
3 that says that that increasing trend is going to be
4 reversed.

5 There are a number of procedural and legal
6 concerns I think that we have in our review to date. I
7 guess I'll leave it at that.

8 Kansas sees Nebraska's current compliance
9 to be significantly influenced by the wet hydrology of
10 the recent years. And we know, I think all, that one
11 day it will turn dry again, and with higher depletions,
12 more problems will result.

13 With all that being said, we do recognize
14 that Nebraska is seeking to find a solution to the
15 problem. And, you know, also, Dick, in your report, we
16 recognize that Colorado as well is taking -- you know,
17 working to find a solution to its compliance problems,
18 and Kansas will continue to work with both of you States
19 to address these issues and concerns.

20 So, with that, I'll conclude my statement.

21 COMMISSIONER WOLFE: All right. Thank you,
22 Commissioner Barfield, for your report.

23 At this time, we're to Agenda Item 5 on the
24 Federal Reports. With the Bureau of Reclamation, it's
25 my understanding, Marv Swanda, are you going to do the

1 155 percent of normal and the greatest ever recorded at
2 the dam.

3 The annual computed inflow of 11,700
4 acre-feet for Bonny was very close to the normal-year
5 forecast.

6 River releases were made during the months
7 of May, June and December in accordance with the orders
8 of the State of Colorado for Republican River Compact
9 compliance. A total of 3361 acre-feet of river outflow
10 was recorded for that purpose.

11 At Enders, the annual presip flow of just
12 over 29 inches at Enders is well above normal, about
13 156 percent, and the greatest ever recorded for that
14 site.

15 The reservoir level began the year at about
16 21 feet below the top of conservation. Due to the
17 extremely low water supply, no water was released from
18 Enders in 2009.

19 At Swanson Lake, the annual presip total
20 was just over 27 inches at Trenton Dam, which is
21 136 percent of normal. The inflow of just over 37,000
22 to Swanson was slightly above the normal-year forecast.

23 Irrigation diversions were made into the
24 Meeker-Driftwood Canal for the Frenchman-Cambridge
25 Irrigation District, and that was the first time since

1 Bureau report?

2 MR. SWANDA: Yes.

3 COMMISSIONER WOLFE: All right. Please
4 come forward and we'll get you a microphone so we can
5 all hear. Ms. Sullivan has got it here.

6 MR. SWANDA: Thank you.

7 My name is Marv Swanda, S-W-A-N-D-A. I am
8 the McCook office manager of Bureau of Reclamation in
9 McCook, Nebraska.

10 As usual, we've prepared a report on all of
11 the federal reservoirs, and I think I set a few of the
12 copies up there for your use.

13 I'd like to just quickly go through kind of
14 our 2009 operations and where we are currently in 2010.
15 In 2009, precipitation at the Republican River and our
16 reservoirs varied from 78 percent of normal in Lovewell
17 to 136 percent of normal in Swanson Lake.

18 Inflows varied from 51 percent of the most
19 probable at Enders to 118 percent of the most probable
20 at Harry Strunk.

21 Our irrigation districts that we supplied
22 water to ranged from zero inches at H&RW to 6 1/2 inches
23 at Kansas Bostwick.

24 At each particular reservoir, Bonny in
25 2009, the annual presip total of 26 inches was about

1 2002.

2 Hugh Butler Lake, the annual presip total
3 of about 24 inches at Red Willow Dam was 122 percent of
4 normal. The reservoir level peaked just 4 1/2 feet
5 below full on June 26, and we did irrigate out of there
6 to the Red Willow Canal.

7 And due to a discovery of cracking in the
8 embankment in late October, resulted in Reclamation
9 evacuated 21,000 acre-feet of storage from Hugh Butler
10 Lake.

11 Now I'll kind of finish up my report with
12 the current status of our safety of dams activities out
13 there.

14 At Harry Strunk, the annual presip total
15 was about 29 inches at Medicine Creek, which is
16 140 percent of normal, the second highest ever recorded
17 at the dam.

18 The reservoir level at the beginning of
19 2009 was just less than a foot below the top of
20 conservation, and we held that to half a foot down, as
21 we normally do through the winter months. And the
22 reservoir was allowed to fill on up in late April and
23 gradually increased over one foot into the flood pool
24 prior to irrigation.

25 Late fall and early winter inflows

1 increased the level of Harry Strunk back to that half
 2 foot below the top of conservation at the end of the
 3 year.
 4 Keith Sebelius Lake, the annual presip at
 5 Norton Dam totaled 32 inches, which is 131 percent of
 6 normal. Irrigation releases were made during July for
 7 the Almena Irrigation District.
 8 At Harlan County, the 2009 inflow, just
 9 over 136,000 acre-feet, was between the normal- and
 10 wet-year forecasts. Harlan County began in 2009, less
 11 than a half a foot below the top of conservation. Flood
 12 releases were made during the first three months of the
 13 year, and the reservoir elevation finished about half a
 14 foot in the flood pool at the end of 2009.
 15 For Lovewell, the 2009 presip at the dam
 16 totaled 21 inches, which was 78 percent of the normal.
 17 The reservoir elevation at the beginning of 2009 was
 18 just a half a foot -- 1 1/2 foot below the top of
 19 conservation, and the pool level increased, filling
 20 conservation space in March.
 21 Current operations at our reservoirs: At
 22 Bonny Reservoir, the reservoir level is 18 feet below
 23 the top of conservation. Bonny recorded -- it was
 24 recorded about 11 inches of presip there in the first
 25 six months of the year, which is 124 percent of average.

1 133 percent of normal.
 2 Keith Sebelius, currently we're 6 foot
 3 below full. There were some limited irrigation releases
 4 made this summer. Presip at the dam during the first
 5 six months was 19 inches, which is 153 percent of
 6 normal.
 7 Harlan County, current water surface level
 8 is just about conservation pool, still a little bit into
 9 the flood pool. We did indicate that this is not a
 10 water shortage year, again, to the RRCA.
 11 And Lovewell recorded about 18 inches of
 12 presip during the first six months of the year,
 13 133 percent of average. Irrigation releases continue
 14 out of there.
 15 And I'd just like to touch on just a couple
 16 of safety-of-dams issues. Norton Dam, we have finished
 17 up the safety-of-dams work there that began in 2007.
 18 That was completed in 2009.
 19 Enders Dam, we -- a small depression was
 20 discovered in 2004, and we are continuing to work on
 21 that. And we hope to install a permanent groundwater
 22 control system in there this fall to take care of the
 23 issues out there.
 24 And in regards to Red Willow, as I
 25 indicated, in late October, a sinkhole was discovered.

1 The reservoir inflow for the period is the
 2 greatest since 2001, but only half of the historic
 3 average. Releases have been made into Hale Ditch and
 4 also for Compact compliance. This year, the reservoir
 5 level is 2 1/2 feet higher than it was at this time last
 6 year.
 7 Swanson Lake is currently 9 feet from full
 8 and is approximately 4 feet higher than last year at
 9 this time. Frenchman-Cambridge Irrigation District is
 10 again irrigating from Swanson Lake for the second year
 11 since 2002.
 12 Enders Reservoir is currently 20 feet below
 13 full. Due to the water supply shortage, H&RW Irrigation
 14 District is not irrigating for the ninth year in a row.
 15 This is the seventh consecutive year that
 16 Frenchman-Valley Irrigation District will not receive
 17 storage from the reservoir.
 18 Hugh Butler Lake, as indicated, we're
 19 28 feet below full. We have received 15 inches, or a
 20 little more than that, about 156 percent of normal
 21 presip out there.
 22 Harry Strunk, currently, near top of
 23 conservation, intending to make releases for Cambridge
 24 Canal for Frenchman-Cambridge Irrigation District. The
 25 precip at the dam in the first six months is about

1 And then subsequently we found transverse cracking in
 2 the embankment, and that resulted in a reservoir
 3 restriction that was in our target range of 22 -- 2552
 4 to 2554, which is just above the dead pool, and we
 5 continue to maintain that at this time.
 6 In February, our reclamation began, a
 7 Corrective Action Study to determine what alternatives
 8 we need to address to fix the dam. We have since then
 9 narrowed those alternatives down to -- I think it's a
 10 number three or so -- and by the fall, we hope to have a
 11 preferred alternative, 2010, for what the fix would be
 12 at the dam.
 13 We did hold a public meeting in the spring
 14 of this year to keep the public informed, and we'll
 15 probably have one this fall to update them at that time.
 16 We will be preparing a Modification Report
 17 that will be transmitted to Congress and OMB by the
 18 spring of 2011 with a potential contract award for mid
 19 to late summer of 2011.
 20 So the activities continue out there, and
 21 we are on a very tight timeframe to get the preferred
 22 alternative determined and continue to move on so that
 23 we can again begin storing water at some point.
 24 And I'll just mention there are some other
 25 items in the report concerning our resource management

1 activities, that kind of thing.
 2 And as always, historic graphs are at the
 3 end of this report, and that will conclude my report.
 4 COMMISSIONER WOLFE: Thank you, Marv.
 5 Commissioners, do you have any questions
 6 for Marv?
 7 Fair enough. Thank you, Marv. I
 8 appreciate the report.
 9 Next we have Ed Parker with the U.S. Army
 10 Corps of Engineers.
 11 Welcome, Ed.
 12 MR. PARKER: Thank you.
 13 Good morning. My name is Edward Parker,
 14 P-A-R-K-E-R. I'm the lead hydrologist for the water
 15 management sector in the Kansas District of the Corps of
 16 Engineers.
 17 I want to thank the Commission for the
 18 opportunity to attend your 50th meeting and present my
 19 couple of items of interest that I hope you'll find
 20 enlightening.
 21 There -- we have, well, two particular
 22 projects of interest that we've had dealings with during
 23 the past year:
 24 Harlan County Lake, we did some studies of
 25 last spring. We've had some issues with the downstream

1 the flood pool.
 2 During the past year, we modified our water
 3 control manual, with the approval of our Division
 4 Office, to permit during water-short years the formal
 5 agreement with the Bureau to store up to 2 feet. And
 6 the decision on how much water is allowed is based on
 7 the same calculation and consensus operating plan for
 8 the shut-off elevation in Harlan County.
 9 Essentially, if it's a water-short year, if
 10 the irrigation supply is under 19,000, then we don't
 11 allow any excess storage at Lovewell. And between
 12 109,000 and 119,000, we gradually allow up to 2 feet.
 13 Anything less than 109,000, we allow the full 2 feet
 14 storage, the ideology being during those periods, the
 15 need for a flood control pool at Lovewell is less and
 16 the need for irrigation is much more, and it helps
 17 balance the beneficial purposes.
 18 And that concludes my report.
 19 COMMISSIONER WOLFE: All right. Thank you,
 20 Ed.
 21 Commissioners, any questions?
 22 All right. Thank you.
 23 At this time, we'll have the report from
 24 John Miller with the U.S. Geological Survey. And I know
 25 you're getting the PowerPoint set up, so if you want to

1 channel capacity that I'm sure you're quite aware of.
 2 Since the late 1950s, in the past, it was estimated
 3 about 4,000 cfs that we could let out of the project
 4 without causing any kind of significant downstream
 5 damage. By 1967, it dropped to about 3,000. And by
 6 1996, it dropped to about 2,000.
 7 Then from May of '98 through 2007, because
 8 of the extended drought and other circumstances, we did
 9 not make any significant flow releases out of the
 10 project.
 11 And since the condition of the project has
 12 lately been more storage than past years, we believe it
 13 was a good opportunity to try to determine how much the
 14 capacity was now, particularly in lieu of, as
 15 Commissioner Barfield mentioned earlier, the anniversary
 16 of the 35th -- the '35 flood.
 17 During March, for a period of about two
 18 weeks, we let 1,000 cfs out of the project and didn't
 19 ascertain any significant damage downstream. And
 20 hopefully we can still do it, at least a little bit of
 21 additional water out of there, if the need be.
 22 The other issue I'd like to bring up is the
 23 Lovewell project on White Rock Creek in Kansas. We have
 24 historically allowed some excess storage in the project
 25 for irrigation benefit in the bottom couple of feet of

1 go ahead, John.
 2 MR. MILLER: Okay. Thank you.
 3 COMMISSIONER WOLFE: If you can get the
 4 lights up in front, whoever remembers how we did it
 5 yesterday, to turn those off. Thank you.
 6 MR. MILLER: There is a packet that I have
 7 provided for each of the Commissioners containing the
 8 annual data report published by the U.S. Geological
 9 Survey, and also all of the graphs that will be
 10 presented in the presentation today.
 11 Well, we had this going here just a little
 12 while ago.
 13 Okay. So today I'm going to present the
 14 annual mean discharge data for 15 sites in the
 15 Republican River Basin. 10 of the 15 are Compact sites
 16 that are funded through the USGS NSIP program.
 17 This first slide is a handout that is
 18 available to everybody. I think there's a stack up
 19 here, possibly a stack in the back, representing the '09
 20 annual mean discharge as it compares to the period of
 21 record.
 22 As I just stated, the first ten sites we'll
 23 go through are the Compact sites that are operated by
 24 the USGS through the NSIP program. We'll be starting
 25 with the upper end of the basin, Nebraska.

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1 The first site is the Arikaree River at
 2 Haigler. It receives returns from the Haigler Canal
 3 that diverts upstream to the North Fork. The North Fork
 4 Republican River has influences through the spring and
 5 summer months on the flows there.
 6 The graphs kind of speak for themselves. I
 7 won't have a whole lot to say, but the annual discharge
 8 for this year is down just a little bit as compared to
 9 last year.
 10 And then also you can see the trend with
 11 the data from the period of record for this site, which
 12 goes all the way back to early '30s.
 13 Next site is the North Fork of the
 14 Republican River at the Colorado state line. This
 15 site -- this was probably reported -- oh, last year, I
 16 suppose, but the wilderness site has just recently been
 17 redone.
 18 Also, the -- with the help of Dave Keeler,
 19 this site with discharge measurements has helped us with
 20 the record.
 21 Go ahead, next slide.
 22 The flows for the water year '09 are up
 23 just a little bit at 33.2 -- sorry, still there? It's
 24 still working. Go ahead.
 25 Next slide is the Buffalo Creek near

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1 Haigler, Nebraska. Go ahead and toggle to the graph
 2 there. The annual flow was up just a little bit from
 3 last year at 3.37.
 4 Also, you'll notice that they are ranked,
 5 and that is on the handout as far as how it compares
 6 with each of the previous years. And all of the sites
 7 that I'll be reporting on today are within the top 10
 8 lowest for the period of record for the annual mean
 9 discharge.
 10 Okay. Go ahead.
 11 The Rock Creek at Parks gage. Go ahead.
 12 Flows are down. They are fairly static from last year.
 13 South Fork of the Republican River near
 14 Benkelman gage. That was a picture of a dry channel
 15 that's now been wet, I think, for just about a solid --
 16 a solid year now. The -- it's been -- it was reported
 17 earlier, the flows are up at the South Fork. The
 18 mean -- annual mean discharge there, which is 10.1,
 19 ranking 11th there.
 20 Frenchman Creek at Culbertson, Nebraska,
 21 down slightly from last year. It had some fairly
 22 significant peaks go through there the previous two
 23 years.
 24 Next slide. Driftwood Creek near McCook,
 25 Nebraska. Annual mean down just a little bit from last

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1 year.
 2 And then next slide is the Red Willow Creek
 3 near Red Willow.
 4 And then Sapa Creek near Stamford.
 5 Continued slight trend upward there.
 6 And then the last slide that -- within the
 7 Compact, the Courtland Canal, Nebraska-Kansas State
 8 Line. And the discharge there was 48.4, up slightly
 9 from last year.
 10 Okay. Continuing on, three sites that are
 11 possibly of interest that are operated by the USGS in
 12 Nebraska, with matching funds from state and local
 13 agencies: First site there is Republican River at
 14 McCook. Flows there are down just a little bit from
 15 last year, annual mean flow of 42.7.
 16 The next site would be Republican River
 17 near Orleans. And the annual flow down just a little
 18 bit again. The previous two years is fairly significant
 19 peaks and the early spring rate, winter period.
 20 And the last site, Republican River at
 21 Stratton, up slightly from last year.
 22 Then there's two other sites that have
 23 possible interest. They are -- the field operations are
 24 conducted by the Nebraska Department of Resources,
 25 Natural Resources.

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1 The first site would be Frenchman Creek at
 2 Palisade. The flow is fairly static from the previous
 3 year, 25.3.
 4 And then the last site, Republican River at
 5 Cambridge. It's down slightly from previous water year.
 6 And the final slide that I have is contacts
 7 of the managers in the Nebraska District Office in
 8 Lincoln.
 9 Thank you.
 10 COMMISSIONER WOLFE: Thank you, John.
 11 Commissioners, any questions of John?
 12 All right. Thank you for the lights.
 13 We're moving through our agenda fairly
 14 well. I think at this time it would be appropriate to
 15 take a break. If we could all reconvene in about 15
 16 minutes. There's refreshments in the back and -- does
 17 that work for the Commissioners, about a 15-minute
 18 break?
 19 All right. Let's do that then.
 20 (Recess taken from 10:20 a.m. until
 21 10:39 a.m.)
 22 COMMISSIONER WOLFE: At this time, we're on
 23 to Agenda Item 6, Committee Reports. The first one is
 24 the Engineering Committee Report by Megan Sullivan.
 25 MS. SULLIVAN: Thank you, Commissioner.

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1 At the August 12, 2009 annual meeting of
 2 the Republican River Compact Administration, the
 3 Commissioners assigned the Engineering Committee nine
 4 tasks. The Engineering Committee and technical
 5 representatives from the States of Colorado, Kansas and
 6 Nebraska participated in several collaborative work
 7 activities and phone conferences in relation to this --
 8 in relation to these assignments and other issues.

9 The following assignments and work
 10 activities were completed:

11 First assignment was to complete the user's
 12 manual for accounting procedures and provide a
 13 resolution for its adoption. The States reviewed the
 14 2006 draft initiated by Kansas and provided comments.
 15 However, a final draft of the manual was not completed.
 16 The assignment should be continued for next year.

17 Second assignment was to complete the
 18 exchange of data requested by Kansas in its August 1,
 19 2008 and July 17, 2009 letters by October 1, 2009.
 20 Nebraska provided the data they had available. The
 21 remaining portion of the data request is retained in the
 22 NRD records. Nebraska believes this remaining data is
 23 not required under the Final Settlement Stipulation.

24 Colorado meter data was not completed. The
 25 best available data will be provided to Kansas and

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1 Nebraska by October 15, 2010.

2 But their assignment was to exchange by
 3 April 15, 2010 the information listed in Section V, or
 4 Roman Numeral V, of the RRCA Accounting Procedures and
 5 Reporting Requirements and any other data required by
 6 that document. By July 15, 2010, the States will
 7 exchange any updates to this data.

8 Each state exchanged its model data sets by
 9 April 15, 2010 or shortly thereafter. A preliminary run
 10 of the RRCA groundwater model was developed by Willem
 11 Schreuder of Principia Mathematica and posted on the
 12 RRCA website he maintains for the Administration.

13 The States exchanged their available final
 14 data by August 6, 2010. Willem Schreuder of Principia
 15 Mathematica will complete a run based on this data at a
 16 later date.

17 Final accounting for 2009 was not
 18 completed. However, data sets were collected by the
 19 Committee for stream flow, climate information,
 20 diversion records, and reservoir evaporation records of
 21 the three states in cooperation with the U.S. Geological
 22 Survey, U.S. Bureau of Reclamation, and U.S. Army Corps
 23 of Engineers for 2009.

24 The fourth assignment was to continue to
 25 review Colorado's augmentation proposal, as appropriate.

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1 This proposal is the subject of an arbitration process.
 2 No additional information was discussed by the
 3 Committee.

4 The fifth assignment was to continue
 5 efforts to resolve concerns relating -- sorry -- related
 6 to varying methods of estimating groundwater and surface
 7 water irrigation recharge and return flows within the
 8 Republican River Basin and related issues. Within 90
 9 days, the States will exchange information and the
 10 Engineering Committee will meet to recommend the next
 11 steps.

12 Each state performed a cursory review of
 13 their respective engineering repositories for published
 14 studies or information pertaining to groundwater
 15 irrigation recharge. Neither Nebraska nor Colorado
 16 found any pertinent information. Kansas assembled a
 17 bibliography of the possible studies and information.
 18 However, no additional progress was made on this
 19 assignment.

20 Sixth assignment was to develop a revision
 21 to the RRCA's Accounting Procedures to reflect
 22 agreements by the RRCA at its 2008 and 2009 annual
 23 meetings and provide the Administration with a
 24 recommendation of any appropriate formatting changes.
 25 A revised accounting procedure was drafted

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1 to reflect changes to both the Frenchman sub-basin and
 2 the Mainstem formulas pertaining to the return flows
 3 from the Riverside Canal.

4 Seventh task was to retain Principia
 5 Mathematica to perform ongoing maintenance of the
 6 groundwater model and periodic updates requested by the
 7 Engineering Committee. Each State has separately
 8 contracted with Principia Mathematica for this task.

9 Number 8 is to continue the development of
 10 a five-year accounting spreadsheet/database for adoption
 11 at the 2010 annual meeting earlier. And this is --
 12 excuse me -- this assignment was not completed, and the
 13 assignment should be continued for next year.

14 And the ninth assignment was to review
 15 accounting procedures to determine if Kansas groundwater
 16 calculated beneficial consumptive use, or CBCU, in the
 17 Mainstem is properly included in the Mainstem Virgin
 18 Water Supply calculation and if necessary, provide a
 19 recommendation to the Administration at the next annual
 20 meeting.

21 Based on a review of the accounting
 22 procedures, the Engineering Committee confirmed that
 23 Kansas groundwater CBCU was missing from the Mainstem
 24 Virgin Water Supply calculations. The accounting
 25 procedures were revised to reflect the inclusion of this

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1 CBCU element in the Mainstem formula, and the
2 Engineering Committee recommends adoption of this
3 change.
4 The Committee recommendations to the
5 Administration is: The Committee recommends the
6 adoption of the revisions to the Accounting Procedures
7 that reflect the changes to the Frenchman and Mainstem
8 sub-basin formulas for the return flows of the Riverside
9 Canal and the change to the Mainstem sub-basin formula
10 to include Kansas groundwater CBCU, as described in
11 Attachment A.
12 The Committee also recommends the adoption
13 of the proposal to relocate the accounting point used in
14 the RRCA groundwater model for the North Fork Republican
15 River sub-basin to the Kansas-Nebraska state line in
16 accordance with Article III of the Compact, as discussed
17 in Attachment B.
18 In addition, the Engineering Committee
19 discussed the use of provisional USGS, or U.S.
20 Geological Survey, data for the Courtland Canal,
21 Station 06852500, as opposed to U.S. Bureau of
22 Reclamation data for the same gage. It is the
23 Committee's recommendation to use the USGS data.
24 At this time, I believe -- excuse me, I
25 need to look at the agenda -- we have some other

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1 matters.
2 Jim, you have something you would like to
3 discuss?
4 COMMISSIONER WOLFE: Could I just make a
5 quick clarification? This may have been just been a
6 misstatement.
7 In your second recommendation, I thought
8 you said that the -- this accounting point would be
9 moved to the Kansas-Nebraska state line. Is that the
10 Colorado?
11 MS. SULLIVAN: It should be the
12 Colorado-Nebraska state line. I apologize.
13 COMMISSIONER WOLFE: All right. Thank you.
14 Mr. Schneider?
15 MR. SCHNEIDER: Thank you, Mr. Chairman.
16 I would -- at this point, I would like to
17 address the comments made by the State of Kansas earlier
18 regarding Nebraska's revised IMPs from an engineering
19 and scientific standpoint.
20 I would like to point out that the
21 Department of Natural Resources has worked
22 collaboratively with the IMPs over the last year and
23 spent literary thousands of hours and conducted very
24 extensive analyses, including tens of thousands of model
25 runs and other numerous analyses in order to conclude

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1 that the process that we have laid out within these IMPs
2 will indeed ensure Compact compliance for the State of
3 Nebraska during all climatic conditions, including dry
4 conditions.
5 And I would stress that we've been
6 struggling with a lot of technically careless and
7 uninformed opinions that are being put out in the open
8 about these IMPs, and I would urge the State of Kansas
9 not to make the same mistake and that we would welcome
10 any discussion that the State of Kansas would like to
11 have on that issue.
12 And certainly the Engineering Committee
13 might be the appropriate forum for us to include that
14 within the -- within discussions as we go forward over
15 the next year.
16 Thank you.
17 COMMISSIONER WOLFE: Go ahead, Megan.
18 MS. SULLIVAN: Okay. Recommended
19 assignments for the coming year for the Engineering
20 Committee:
21 First, finalize the work on the user's
22 manual for the RRCA Accounting Procedures and provide a
23 recommendation to the Administration for adoption at
24 next year's annual meeting or earlier.
25 Exchange by April 15, 2011 the information

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1 listed in Section V of the RRCA Accounting Procedures
2 and Reporting Requirements and other data required by
3 that document. By July 15, 2011 the States will
4 exchange any updates to these data.
5 Continue efforts to resolve concerns
6 related to the varying methods of estimating groundwater
7 and surface water irrigation recharge and return flows
8 within the Republican River Basin and related issues.
9 Fourth assignment: Retain Principia
10 Mathematica to perform ongoing maintenance of the
11 groundwater model and periodic updates as requested by
12 the Engineering Committee for the calendar year 2011.
13 The billable costs shall be limited to actual costs
14 incurred, not to exceed \$15,000 in total, and will be
15 apportioned in equal one-third amounts to the States of
16 Colorado, Kansas and Nebraska respectively.
17 Fifth assignment: Continue development of
18 a five-year accounting spreadsheet/database for adoption
19 at the 2011 annual meeting or earlier.
20 No. 6: Continue to review Colorado's
21 augmentation proposal, as appropriate.
22 No. 7: Continue efforts to finalize
23 accounting for 2008 and 2009. By October 15, 2010, the
24 Engineering Committee will meet to discuss issues
25 surrounding model inputs and accounting data. Also, by

1 October 15, 2010, Colorado will provide meter data as
2 required under the Final Settlement Stipulation.

3 No. 8: By October 15, 2010, the
4 Engineering Committee will meet to discuss issues
5 preventing agreement on final accounting for the years
6 2006 through 2009.

7 No. 9: Discuss water short year accounting
8 for Beaver Creek.

9 And No. 10: Discuss and resolve the issue
10 of missing precipitation data.

11 And that concludes the report of the
12 Engineering Committee.

13 COMMISSIONER WOLFE: Are there any
14 questions for Ms. Sullivan at this time in regards to
15 the report of the Engineering Committee?

16 All right. So is that all there is to
17 report for now for the Engineering Committee?

18 Are we ready to move on to the Conservation
19 Committee? All right. At this time, we'll have Scott
20 Guenthner come up and give us a report on the
21 Conservation Committee. We have a microphone you can
22 use there.

23 MR. GUENTHNER: For the record, I'm Scott
24 Guenthner. I'm with the Bureau of Reclamation out of
25 our regional office in Billings.

1 I'm here today, however, to report on the
2 status on behalf of the Conservation Committee. The
3 study of non-federal reservoirs and terraces on -- the
4 effect of those on water supply, that's being conducted
5 according to a study plan approved by the Compact
6 Administration at their annual meeting in 2004.

7 The study has been conducted substantially
8 in accordance with that study plan. We have, however,
9 added two significant work elements to that that we
10 didn't expect. That was the terrace condition survey
11 and the mapping of terrace lands in Kansas. We didn't
12 envision doing that, those two elements.

13 We have previously reported to you in
14 previous meetings the status reports, that that was
15 being done, so we won't go into details today on that.

16 The study essentially utilizes a water
17 balance model to estimate impacts of reservoirs and
18 terraces. We've also reported on that previously.

19 There are basically three elements to that
20 water balance model. There's input data that we've
21 collected in the past six years. That element is
22 essentially complete.

23 There is the water balance modeling aspect.
24 I'd have to report today that there is a lot of that
25 work done, although I don't think we can say it is

1 complete. We've done a lot of work that identifies the
2 impact of reservoirs and terraces in the field.

3 The element that is missing is that impact
4 has not been transferred to each -- to the mouth of each
5 designated sub-basin. That is yet to be completed, and
6 part of that has to do with identifying and summarizing
7 all the land use information and practices in a
8 particular basin. That work is presently underway.
9 That's part of the post processing of the model results
10 that we have been talking about.

11 We did transmit to the Compact
12 Administration a brief report last week. It's an
13 eight-page document. It really is -- gives examples of
14 some of the results to date. We'd be willing to work
15 with the state representatives on the Conservation
16 Committee and get that report posted to a website so
17 that it is available for others to look at.

18 Right now, the report has only been
19 transferred to the Compact Administration and to the
20 members of the Conservation Committee. So we can make
21 that report available.

22 I noticed from our discussion yesterday
23 that there were a few minor errors in the report. I
24 think we would choose to correct those before we get it
25 posted to a website.

1 In more administrative type of things
2 related to the study, the Final Settlement Stipulation
3 indicated that the study costs should not exceed a
4 million dollars. The States were to be responsible for
5 250,000 of that, and the other were to be federal funds
6 that come through the Bureau of Reclamation.

7 From our summary of those costs,
8 collectively, the three States have exceed the 250,000
9 that was identified in the Settlement Stipulation and
10 study costs have exceeded the \$1 million, mostly due to
11 the two elements of work that we added that I mentioned
12 earlier.

13 I would expect that there would be some
14 additional costs due to in-kind services from the State
15 by participating in some conference calls and other
16 meetings this fall. I think it's the hope of the
17 Conservation Committee that we would have our results
18 finalized this fall. I am not sure if that's a doable
19 thing or not, but that's what our goal is.

20 One last element: The Conservation
21 Committee does intend to document the findings of the
22 report. We've been issuing these status reports, and I
23 think we'll continue to do that.

24 I know that Dr. Derrel Martin and Jim
25 Koelliker, here today, they're the principal

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1 investigators. I know they have plans for professional
2 papers that will document the study.
3 In addition to that, we will probably have
4 some sort of concluding report from the Conservation
5 Committee.
6 That concludes my report for today.
7 COMMISSIONER WOLFE: All right. Thank you,
8 Scott. Appreciate that and your efforts of the
9 Committee as well.
10 Commissioners, any questions at this time?
11 COMMISSIONER DUNNIGAN: No.
12 COMMISSIONER BARFIELD: Just one -- just
13 one comment. These microphones are giving us trouble,
14 aren't they?
15 I appreciate your report. I appreciate the
16 hard work. Obviously, I do think there does need to be
17 a final report, and I appreciate the Bureau and study
18 lead wanting time to finish it up properly and -- but
19 obviously the FSS requires the completion. And I think
20 a final report is consistent with that, and I'd urge you
21 to get it done as quick as you can. I know
22 Dr. Koelliker wants to retire, so -- but that's all I
23 have.
24 COMMISSIONER WOLFE: I understood, talking
25 to him yesterday, that he was going to make this his

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1 retirement project, so -- anyway, we do appreciate your
2 efforts on that and look forward to a final report.
3 Thank you.
4 At this time, we'll move on in the agenda
5 to Item 7, Old Business. We've already discussed the
6 dispute resolution. I have nothing more to add. I
7 think Commissioner Barfield did an excellent job
8 describing the status of the current dispute resolution
9 process.
10 In regards to Agenda Item 7(b), Status of
11 the 2006, '7, and '8 Final Accounting, I think that has
12 been reported on, discussed as part of the Engineering
13 Committee Report as well.
14 There are some outstanding issues that are
15 under consideration by the Committee and the
16 Commissioners to reach final resolution on that and
17 ultimately seek approval of the final accounting. So
18 it's just a mere reflection in the record that we want
19 to keep tabs on the status of those particular years
20 that had not had their final accounting approved.
21 I don't know if you Commissioners, you had
22 anything you wanted to add to that specifically at this
23 time?
24 COMMISSIONER BARFIELD: No. We -- just to
25 report, we had significant discussions on this in the

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1 work session last night, and I think we all want to get
2 to agreement on the inputs especially as quick as
3 possible and identify what remains to get to the
4 agreement on the accounting.
5 So we'll work -- work hard to get that
6 done, best as we can, this fall. So we don't keep
7 piling them up one after the other.
8 COMMISSIONER WOLFE: Yeah. I think there
9 was some confusion there about the process. There may
10 have been some approval of the input data and approval
11 aspects of changes in models and things that we have
12 coming under consideration resolutions.
13 But here we're ultimately talking about
14 after those processes, to have final accounting done
15 with all of those changes approved and input data
16 approved as part of that process.
17 Agenda Item 7(c), Mr. Burke Griggs, did you
18 want to give us an update on that, please.
19 MR. GRIGGS: Thank you.
20 This is a brief report from the Ad Hoc
21 Legal Committee. The Administration formed the Ad Hoc
22 Legal Committee to resolve the issue of the approval of
23 the diversion of water from one state that is used in
24 another state.
25 Having considered the issue and concluded

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1 that there is no clear legal resolution of it, the Ad
2 Hoc Legal Committee has decided not to pursue it any
3 further.
4 COMMISSIONER WOLFE: Thank you for that
5 reporting.
6 Any questions for Mr. Griggs?
7 All right. At this time, we're on Agenda
8 Item 7(d), the Status of the Lower Republican River
9 Feasibility Study.
10 Commissioner Barfield?
11 COMMISSIONER BARFIELD: Yes.
12 The Bureau did have a bit of a statement on
13 this in their report. The Lower Republican Feasibility
14 Study is a follow-up to the prior study that was
15 conducted after the FSS was concluded by the States of
16 Nebraska, Kansas and Bureau of Reclamation that looks at
17 alternatives for improved management in the Lower Basin,
18 including alternatives like raising Lovewell, improving
19 efficiencies in the canal systems, looked at other
20 storage sites in Kansas and Nebraska in the lower part
21 of the Basin.
22 As reported last year, that study, the
23 follow-up study on the feasibility study that looks at
24 the most promising alternatives in greater detail has
25 now been authorized by Congress. That's the first step.

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1 We are awaiting the Federal Government to
 2 fund their share. It's a 50/50 cost share between the
 3 Federal Government and the two States, and we will
 4 continue to work with our Federal Congressional
 5 representatives to seek to secure that funding, is
 6 the -- really, the current status.

7 COMMISSIONER WOLFE: Commissioner Dunnigan,
 8 questions?

9 COMMISSIONER DUNNIGAN: Thank you.
 10 We had discussed this issue earlier this
 11 year also, and at that particular point in time, I
 12 stated that Nebraska stands ready to support the
 13 appraisal -- or the feasibility study with funding when
 14 the Federal funding comes.

15 COMMISSIONER WOLFE: All right. Thank you
 16 for that update.

17 At this point, we're on to Agenda Item 8,
 18 New Business and Assignments to the Compact Committees.

19 First is the action on the Engineering
 20 Committee Report and assignments that Ms. Sullivan had
 21 reported to us.

22 So at this time, I would entertain a motion
 23 for approval of the Engineering Committee Report and the
 24 respective assignments.

25 COMMISSIONER DUNNIGAN: So moved.

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1 COMMISSIONER BARFIELD: Second.
 2 COMMISSIONER WOLFE: All right. Any
 3 discussion?

4 COMMISSIONER BARFIELD: So just for
 5 clarity, we're receiving or accepting -- or whatever --
 6 the report and essentially assigning to them what they
 7 recommended that we assign them; is that right?

8 COMMISSIONER WOLFE: That's my
 9 understanding.

10 COMMISSIONER DUNNIGAN: Right.
 11 COMMISSIONER BARFIELD: Okay.
 12 COMMISSIONER WOLFE: All right.
 13 Discussion?

14 All those in favor, signify by saying aye.
 15 COMMISSIONER BARFIELD: Aye.
 16 COMMISSIONER DUNNIGAN: Aye.
 17 COMMISSIONER WOLFE: Aye. Any opposed?
 18 Motion approved.

19 COMMISSIONER BARFIELD: I'm sorry. I guess
 20 I would just add one comment on the data issue.
 21 There was a statement in the report that
 22 Nebraska doesn't agree that the backup data in the NRDs
 23 is required in the FSS. And I guess -- it's stated, I
 24 believe, because that's their position.
 25 I guess I'd just like to state that we

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1 believe that the Compact and the FSS require disclosure
 2 of underlying data where there's a legitimate need for
 3 such. The NRDs have the data.

4 And we'll be sending a formal request for
 5 that data in the near future and maybe a bit of backup
 6 as to why we think that is -- is required under the FSS,
 7 so I would just note that -- that will happen, so . . .

8 COMMISSIONER WOLFE: Okay. Any response?
 9 Mr. Schneider?

10 MR. SCHNEIDER: Yeah. Just to clarify,
 11 too, that position simply refers to the fact that it
 12 seems clear to us that it's not required as part of our
 13 regular annual reporting, and that's why we haven't done
 14 so. But we would certainly work with Kansas to see if
 15 we can accommodate that on a one-time basis as needed.

16 COMMISSIONER BARFIELD: Okay. We'll work
 17 on that.

18 COMMISSIONER WOLFE: All right. Thank you.
 19 All right. As part of Agenda Item 8(a), as
 20 a result of some of the recommendations out of there,
 21 there were -- there's a series of steps we need to go
 22 through to adopt, ultimately, a couple of resolutions by
 23 the Compact Administration regarding the RRCA
 24 groundwater model changes and also the RRCA's Accounting
 25 Procedures and Reporting Requirements.

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1 And I'll attempt to step us through this
 2 with a series of motions and seeking approval by the
 3 Commissioners. Ultimately, we'll have to, if this all
 4 goes as planned, adopt and approve four motions to get
 5 through this process.

6 The first of these that we need to actually
 7 take action on is in regards to a motion to waive the
 8 15-day notice requirement under Rule 13. So that's the
 9 first motion that I'd like to entertain for approval by
 10 the Compact Administrators.

11 COMMISSIONER BARFIELD: Are you looking for
 12 a so moved?

13 COMMISSIONER WOLFE: Yes.
 14 COMMISSIONER BARFIELD: Yes. I would move
 15 that we waive the 15-day notice requirement of Rule 13
 16 for adoption of the minutes of the rules.

17 COMMISSIONER WOLFE: All right.
 18 COMMISSIONER DUNNIGAN: Second.
 19 COMMISSIONER WOLFE: Second? All right.
 20 All those in favor, signify by saying aye.
 21 COMMISSIONER DUNNIGAN: Aye.
 22 COMMISSIONER BARFIELD: Aye.
 23 COMMISSIONER WOLFE: Aye. Motion approved.
 24 Second motion for consideration is I would
 25 entertain a motion to amend Rule 19 -- 14 -- did I say

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1 13 -- I'm sorry, Amend Rule 14 to reflect today's date
 2 for the revisions to the groundwater -- excuse me,
 3 revisions to the RRCA groundwater model and accounting
 4 procedures if the RRCA accepts the following two
 5 resolutions.
 6 COMMISSIONER DUNNIGAN: The model version,
 7 is that in that?
 8 COMMISSIONER WOLFE: Yes. The motion would
 9 reflect revisions to the RRCA groundwater model, as well
 10 as the Accounting Procedures and Reporting Requirements.
 11 COMMISSIONER BARFIELD: So moved. I
 12 believe the -- well, let's hear a second.
 13 COMMISSIONER DUNNIGAN: Second.
 14 COMMISSIONER WOLFE: Thank you.
 15 Discussion?
 16 COMMISSIONER BARFIELD: I think the dates
 17 will be reflected in the following two resolutions that
 18 you refer to in the motion.
 19 COMMISSIONER WOLFE: That is correct.
 20 COMMISSIONER BARFIELD: So we'll get
 21 specific in the following two resolutions.
 22 COMMISSIONER WOLFE: Yes. That will be
 23 reflected in there. And I will -- when we get to those
 24 two motions to act on, I will read those respective
 25 motions into the record.

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1 COMMISSIONER BARFIELD: All right. For the
 2 purposes of the -- those here that aren't familiar with
 3 our Rules, Rule 14 essentially adopts the accounting
 4 procedures and the groundwater model as our procedures
 5 for doing the Compact accounting.
 6 So as we amend those procedures to reflect
 7 our agreements, that is, we amend the model to reflect
 8 our agreement, we're just adopting the official versions
 9 of those two documents. So that's what we're up to
 10 here.
 11 COMMISSIONER WOLFE: That is correct.
 12 Thank you, Commissioner.
 13 Any other discussion?
 14 All those in favor signify by saying aye.
 15 COMMISSIONER DUNNIGAN: Aye.
 16 COMMISSIONER BARFIELD: Aye.
 17 COMMISSIONER WOLFE: Aye. Motion approved.
 18 Okay. We're going to take each of these
 19 next two resolutions separately.
 20 I'll start with the resolution of the
 21 report from River Compact Administration changes to the
 22 RRCA groundwater model. I'll go ahead and read the
 23 resolution as it's drafted, and then I'll make a
 24 statement in regard to a motion to approve that
 25 resolution.

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1 Whereas, on August 13, 2008, the Republican
 2 River Compact Administration accepted the proposal set
 3 forth in the Engineering Committee's August 12, 2008
 4 report to move the groundwater model accounting cell at
 5 Guide Rock; and whereas the Engineering Committee
 6 recommended in its August 12, 2009 and August 12, 2010
 7 reports to move the groundwater accounting point for the
 8 North Fork sub-basin to the Colorado-Nebraska state
 9 line.
 10 Now, therefore, it is in the resolution of
 11 the Republican River Compact Administration to approve
 12 and adopt the proposal set forth in Attachment B of the
 13 Engineering Committee's August 12, 2010 report, a copy
 14 of which is attached as Exhibit A, and to adopt
 15 Version 12, S as in Sam, 2, the number 2, of the
 16 groundwater model, which reflects these changes.
 17 Approved by the Republican River Compact
 18 Administration this 12th day of August, 2010, by the
 19 Undersigned Commissioners.
 20 At this time, I would entertain a motion to
 21 approve Version 12-S2 of the RRCA groundwater model, and
 22 these changes are intended to apply to the accounting
 23 years 2009 and on. And it is not currently applicable
 24 to unapproved accounting for prior years, and each State
 25 reserves its rights as to whether it applies to prior

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1 unapproved accounting.
 2 COMMISSIONER DUNNIGAN: So moved.
 3 COMMISSIONER BARFIELD: Second.
 4 COMMISSIONER WOLFE: All right. Any
 5 discussion in regards to the motion?
 6 COMMISSIONER DUNNIGAN: I would just like
 7 to state for the record that Nebraska's position going
 8 forward will be that as this body identifies an error in
 9 accounting procedures or in the groundwater model, that
 10 once those errors are identified and agreed to as
 11 errors, that they should be incorporated in any
 12 accounting that has not been finalized in the past. And
 13 that's what we'll continue to discuss with Colorado and
 14 Kansas in the future.
 15 COMMISSIONER WOLFE: Okay. Thank you.
 16 Mr. Barfield, any comments?
 17 COMMISSIONER BARFIELD: Not at this time.
 18 COMMISSIONER WOLFE: Okay. Thank you.
 19 All right. All those in favor, signify by
 20 saying aye.
 21 COMMISSIONER DUNNIGAN: Aye.
 22 COMMISSIONER BARFIELD: Aye.
 23 COMMISSIONER WOLFE: Aye. Motion approved.
 24 The second and last resolution for
 25 consideration today in regards to these motions is in

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1 regards to a resolution to the changes to the RRCA's
2 Accounting Procedures and Reporting Requirements.
3 Whereas, the Engineering Committee
4 recommended in its August 12, 2010 report to amend the
5 Republican River Compact Administration Accounting
6 Procedures and Reporting Requirements to correct the
7 formulas used to compute the virgin water supply for
8 both Frenchman Creek and the Mainstem so as to properly
9 account for the return flows from the Riverside Canal;
10 and whereas, the Engineering Committee also recommended
11 in its August 12, 2010 report to amend the Republican
12 River Compact Administration Accounting Procedures and
13 Reporting Requirements to include in the formula used to
14 compute the Mainstem Virgin Water Supply the groundwater
15 impacts attributed to Kansas well pumping (GWk) as
16 calculated by the groundwater model.
17 Now, therefore, it is the resolution of the
18 Republican River Compact Administration to approve and
19 adopt the proposal set forth in the Attachment A of the
20 Engineering Committee's August 12, 2010 report, a copy
21 of which is attached as Exhibit A, and to adopt the
22 Revised Accounting Procedure and Reporting Requirements,
23 dated August 12, 2010, that reflects these corrections.
24 Approved by the Republican River Compact
25 Administration this 12th day of August, 2010, by the

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1 undersigned Compact Commissioners.
2 Just as I'm reading that, is that correct
3 that both of these refer to Attachment A? Okay. But it
4 referred to Exhibit A in there. Is that -- both of
5 those refer to Exhibit A? Oh, there's -- okay. I do
6 see that they do reflect separately. Okay. Thank you.
7 Okay. At this time, I would entertain a
8 motion to approve changes to the RRCA Accounting
9 Procedures and Reporting Requirements, and these changes
10 are intended to apply to accounting years 2009 and on
11 and is not currently applicable to unapproved accounting
12 for prior years, and each State reserves its arguments
13 as to whether it applies to prior unapproved accounting.
14 COMMISSIONER BARFIELD: So moved.
15 COMMISSIONER DUNNIGAN: Second.
16 COMMISSIONER WOLFE: All right. Any
17 discussion in regards to the proposed motion?
18 Hearing none, all those in favor signify by
19 saying aye.
20 COMMISSIONER DUNNIGAN: Aye.
21 COMMISSIONER BARFIELD: Aye.
22 COMMISSIONER WOLFE: Aye. Motion approved.
23 Okay. At this time, we're on Agenda Item
24 8(b) --
25 COMMISSIONER BARFIELD: Can I just say

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1 something follow-up?
2 COMMISSIONER WOLFE: Sure.
3 COMMISSIONER BARFIELD: So who's going to
4 amend the Rules? I mean, we actually -- we've
5 essentially put everything in place, but somebody needs
6 to actually amend it, and then the Compact
7 Administration needs to sign it.
8 When and how that's going to be -- are we
9 sort of authorizing you-all to put those new things in
10 there, and then you'll pass a resolution around and it
11 will be dated today? Is that the intention?
12 COMMISSIONER WOLFE: Yeah. We'll take that
13 on and make those changes and circulate those --
14 COMMISSIONER BARFIELD: Okay.
15 COMMISSIONER WOLFE: -- to the other two
16 States and the Accounting Procedures as well.
17 COMMISSIONER BARFIELD: All right.
18 COMMISSIONER WOLFE: Since we are the
19 hosting State this year and I'll ask Ms. Sullivan, as
20 part of the Engineering Committee, to facilitate that
21 and then she'll work with the Engineering Committee to
22 make sure we've got those there and then circulate them
23 then to the Commissioners.
24 COMMISSIONER BARFIELD: Okay. Thank you.
25 COMMISSIONER WOLFE: Thank you for pointing

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1 that out.
2 Okay. Any other discussion in regards to
3 the report or assignments?
4 All right. At this time, I'd like to turn
5 it over to Commissioner Barfield in regards to proposed
6 resolution for Mr. Lee Rolfs.
7 COMMISSIONER BARFIELD: Well, the
8 Administration from time to time recognizes certain
9 individuals that have contributed significantly to the
10 success of the Compact Administration. We always wait
11 until they're gone to do so, for some reason, and Lee
12 Rolfs was an attorney with the Department for 31 years
13 and was a part of the annual meetings of the Compact for
14 most of that career. And anyway, I'd like to read the
15 resolution and then request that we pass it.
16 It's entitled Resolution of Republican
17 River Compact Administration Honoring Mr. Lee E. Rolfs.
18 Whereas, Lee E. Rolfs of Topeka, Kansas
19 retired from his position in 2008 as legal counsel to
20 the Division of Water Resources Kansas Department of
21 Agriculture after having served faithfully in the
22 position for over 31 years.
23 And whereas, in his capacity as legal
24 counsel, Lee has diligently represented the interests of
25 the State of Kansas and its residents of the Republic

1 River Basin, as well as those of Kansas's other
 2 interstate basins.
 3 And whereas, Lee has worked in an exemplary
 4 manner throughout his career to cooperate with the
 5 States of Colorado and Nebraska in the effective
 6 administration of the Republican River Compact and to
 7 improve the workings of the Republican River Compact
 8 Administration.
 9 And whereas, Lee has played a central role
 10 in litigation of Kansas v. Colorado and Nebraska,
 11 No. 126 Original, which sought to resolve fundamental
 12 disputes concerning the quantification and location of
 13 water of the Republican River, as well as other disputes
 14 associated with Republican River Compact.
 15 And whereas, Lee played a commensurate
 16 leadership role in the settlement of that litigation,
 17 working with legal counsel and the technical experts
 18 from the other States to achieve the final settlement
 19 stipulation of 2003, which produced a more satisfactory
 20 resolution of Compact disputes than protracted
 21 litigation could have accomplished.
 22 And whereas, Lee's vast knowledge of water
 23 law, his positive attitude, his friendly personality,
 24 and his congenial temperament have been great assets to
 25 the Compact Administration and the State of Kansas, now

1 relationships between the States. So please express our
 2 sincerest gratitude, as well, to Mr. Rolfs.
 3 COMMISSIONER BARFIELD: All right. Thank
 4 you.
 5 COMMISSIONER WOLFE: All those in favor,
 6 signify by saying aye.
 7 COMMISSIONER DUNNIGAN: Aye.
 8 COMMISSIONER BARFIELD: Aye.
 9 COMMISSIONER WOLFE: Aye. Motion approved.
 10 Thank you, Commissioner Barfield, for
 11 bringing that forward to the Commissioners.
 12 At this time, we're on to Agenda Item 8(c).
 13 This is in regards to a request to dissolve the Ad Hoc
 14 Legal Committee.
 15 So at this time, I'd entertain a motion to
 16 absolve -- dissolve, excuse me -- attorneys probably
 17 understand the nuance there -- dissolve the Ad Hoc Legal
 18 Committee as there are no current assignments to that Ad
 19 Hoc Committee. So I would at this time entertain that
 20 motion.
 21 COMMISSIONER DUNNIGAN: So moved.
 22 COMMISSIONER BARFIELD: Second.
 23 COMMISSIONER WOLFE: All right. Any
 24 discussion?
 25 All those in favor, signify by saying aye.

1 therefore, be it hereby resolved that the Republican
 2 River Compact Administration does hereby express its
 3 sincerest gratitude and appreciation to Lee E. Rolfs for
 4 his excellent and dedicated service.
 5 Be it further resolved that the Republican
 6 River Compact Administration honor Mr. Rolfs' service by
 7 including this resolution and the appropriate dedicatory
 8 remarks in the Annual Report for the Compact year of
 9 2009 and hereby instructs the Administration to send
 10 copies of this resolution to the Rolfs family and to the
 11 Governor of the State of Kansas.
 12 And then it says, Adopted by the Republican
 13 River Compact Administration on this 12th day of 2010 at
 14 the 50th Annual Meeting of RRCA held in Burlington,
 15 Colorado.
 16 So I would move that we sign this
 17 resolution.
 18 COMMISSIONER DUNNIGAN: Second.
 19 COMMISSIONER WOLFE: All right. Motion,
 20 second. Any discussion?
 21 I'd like to also just express our gratitude
 22 as well. I know I did not work for a long period with
 23 Mr. Rolfs, but I do concur with the remarks you stated
 24 in here and his efforts and his personality and so forth
 25 was very beneficial, I think, in seeking cooperative

1 COMMISSIONER DUNNIGAN: Aye.
 2 COMMISSIONER BARFIELD: Aye.
 3 COMMISSIONER WOLFE: Aye. Motion approved.
 4 Thank you to those who are on that Ad Hoc
 5 Committee for your advice and recommendations.
 6 At this time, we're on to Agenda Item 9,
 7 Remarks from the Public. Do we have anyone here in the
 8 audience who would like to address the Commissioners at
 9 this time?
 10 Mr. Edgerton. We have a microphone that
 11 you can utilize there. Welcome.
 12 MR. EDGERTON: Commissioners, my name is
 13 Brad Edgerton. I'm the manager for Frenchman-Cambridge
 14 Irrigation District, which serves 45,600 acres with
 15 natural flow from the Republican River and Red Willow
 16 Creek.
 17 In addition to the natural flow, we have
 18 three federal reservoirs that we can call on for storage
 19 water when the flow of the river is insufficient to meet
 20 our permitted diversion rate.
 21 On July 11, 1951, the State of Nebraska
 22 granted the Bureau of Reclamation a storage permit for
 23 Trenton Dam totaling 122,800 acre-feet. Eight days
 24 later, on July 19, 1951, Frenchman-Cambridge Irrigation
 25 District Board of Directors signed a contract with the

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1 Bureau of Reclamation for 91,359 acre-feet of that
2 storage supply.
3 91,000 acre-feet is equivalent to three
4 irrigation seasons for the 17,000 acres in the
5 Meeker-Driftwood Canal. Colorado is fast approaching
6 that volume of water, which has been illegally diverted
7 from the stream by the terms of the Republican River
8 Compact and the Final Settlement Stipulation.
9 During this same period, water users in
10 Nebraska responsible for the construction costs of the
11 project under the Meeker-Driftwood Canal had zero water
12 for six consecutive years.
13 We do appreciate the work Colorado has done
14 towards compliance with the Compact and understand the
15 sacrifice Colorado water users are making to help
16 achieve compliance.
17 However, Commissioner Wolfe, it's not
18 enough. You need to do more and now. You agreed to a
19 five-year rolling average, not a 15-year average.
20 In March of 2008, Frenchman-Cambridge
21 Irrigation District petitioned DNR to reevaluate the
22 Republican River Basin as allowed in State Statutes
23 46-713.2. That petition was denied by DNR.
24 Frenchman-Cambridge recently appealed
25 Director Dunnigan's decision not to scientifically

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1 evaluate the Republican River Basin. We believe
2 reevaluation will illustrate just how far we have
3 overdeveloped. A sound understanding of the real
4 problem will allow Nebraska to develop reasonable
5 management solutions.
6 We have always believed that a sustainable
7 supply should be the goal. Minute groundwater is not
8 sustainable. We have said that the upper -- it was said
9 that the Upper Republican NRD lag effect has peaked. I
10 don't believe this. As long as there is base flow in
11 the streams to deplete, those depletions in the upper
12 basin will continue to increase until the streams are
13 dry.
14 This should be a major concern for this
15 Commission, and I would hope that the work Nebraska has
16 started with the newly formed Republican River
17 Sustainable Task Force would spread into Colorado. We
18 simply cannot use more water than what Mother Nature
19 gives us and expect it to be there for the next
20 generation.
21 If you think water is not going to be
22 valuable in the future, then we should use it up now.
23 If you think different, then it is your duty as
24 representatives of State Government to protect that
25 resource for all, now and forever.

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1 Thank you.
2 COMMISSIONER WOLFE: Thank you. Any
3 questions?
4 Thank you. Any other comments from the
5 audience?
6 Seeing none, we will continue to move on.
7 We're on to Agenda Item No. 10, Future
8 Meetings. We had discussed yesterday, in light of some
9 of the items like the status of previous annual reports
10 and meeting reports, having not been completed yet, that
11 having those before us, that we would take those up at a
12 special meeting with other matters that would come
13 before this Administration around the first part of
14 November. We will work amongst ourselves to set a date
15 that's acceptable to everyone to do that and identify
16 which agenda items should be included in that agenda.
17 Also, we'll have a year from now, again, in
18 August of 2011, the next annual meeting in Colorado. We
19 think we've -- we like the arrangements that we've had
20 here in Burlington. And although we haven't finalized
21 it, I would anticipate that we might have next year's
22 annual meeting, as well, here in Burlington, if that
23 works to everyone's satisfaction. But we'll obviously
24 have to get those dates set and make sure we have a
25 facility like this to conduct that meeting.

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1 So before we adjourn, are there any last
2 comments or remarks from the Commissioners?
3 COMMISSIONER BARFIELD: Do we want to set a
4 date yet? And I guess I have a question with respect to
5 the date of the annual meeting. It seems like every
6 year we have to write each other.
7 Okay. Rule No. 9 says: The Republican
8 River Compact shall hold a regular meeting prior to
9 August 1 of each year. And then it says we can waive
10 that if we all agree, and I think every year we've done
11 that.
12 Are we getting closer to the point where
13 maybe we could not have to move into August to conduct
14 the meeting? I mean, could we do a July meeting, as
15 sort of our Rules envision, or are we still to the point
16 where we can't get the work done in time?
17 COMMISSIONER WOLFE: And some of you may
18 know the history on this, but I understand part of the
19 reason for going into August is because some of the
20 estimates for some of the accounting stuff isn't done
21 until the end of July. And I don't know if that's what
22 caused this to move into August or not, but that's my
23 understanding of it, so --
24 COMMISSIONER BARFIELD: Well, I think
25 that's correct, although I think Colorado -- we could do

1 it earlier, let me just state it that way. And I guess
 2 I'm asking -- I know there's some -- you know, it took
 3 time to really sort of figure out all the procedures,
 4 and I think the extra time was needed.
 5 I guess I'm asking the Administration
 6 whether it's still necessary to meet in August? And
 7 maybe we don't have to fix a date today. Maybe -- I
 8 don't know if you need time to make that determination
 9 or not.
 10 You all had certain input, I think, that
 11 was -- that the last input was not available until
 12 July 1, if I remember right. We're moving to eagle
 13 data, but I'm not sure -- and that's county ag statistic
 14 data, correct?
 15 COMMISSIONER WOLFE: That's correct.
 16 COMMISSIONER BARFIELD: Well, I guess I
 17 would just ask the administration, maybe the Engineering
 18 Committee can consider this, if we could move it into
 19 July, I think it will be good.
 20 COMMISSIONER WOLFE: From my perspective,
 21 I'm not opposed to that. I think if there was some
 22 reason that we were holding off because of the
 23 availability of data, and if that's not a continuing
 24 concern, I have no problem moving it up into July if
 25 that works for everyone.

1 Any other comments? Commissioner Dunnigan?
 2 COMMISSIONER DUNNIGAN: No other comments.
 3 COMMISSIONER WOLFE: All right. At this
 4 time, I'd entertain a motion for adjournment.
 5 COMMISSIONER DUNNIGAN: So move.
 6 COMMISSIONER BARFIELD: Second.
 7 COMMISSIONER WOLFE: All those in favor,
 8 signify by saying aye.
 9 COMMISSIONER DUNNIGAN: Aye.
 10 COMMISSIONER BARFIELD: Aye.
 11 COMMISSIONER WOLFE: Aye.
 12 We are adjourned. Thank you all much and
 13 be safe in your travels back home.
 14 (The meeting adjourned at 11:28 a.m.)
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1 COMMISSIONER DUNNIGAN: Whatever works is
 2 fine with Nebraska.
 3 COMMISSIONER WOLFE: Well, I think given
 4 the way the Rule reads now, unless we take this action
 5 with you, writing these letters to waive that into
 6 August, so why don't we try to anticipate that we would
 7 conduct this by the end of July next year, and we'll
 8 talk amongst ourselves and the Engineering Committee to
 9 make sure we're on task to get all of the assignments
 10 and data in place and try to set that date as soon as we
 11 can and get it on everyone's calendar by the end of
 12 July.
 13 COMMISSIONER BARFIELD: All right. Thank
 14 you.
 15 COMMISSIONER WOLFE: We'll work on,
 16 obviously, the availability of this facility if we
 17 indeed go to Burlington again, but I think it's a good
 18 suggestion.
 19 COMMISSIONER BARFIELD: I appreciate your
 20 hosting and I think it's been a good meeting and very
 21 good accommodations and good hosting. Thank you much.
 22 COMMISSIONER WOLFE: Well, maybe we'll fill
 23 this entire place next year after the three States
 24 approve the Compact Compliance Pipeline, so we'll work
 25 on that.

SUMMARY REPORT OF THE ANNUAL
MEETING OF THE REPUBLICAN RIVER
COMPACT ADMINISTRATION

August 12, 2010

Burlington Colorado

Minutes

A transcript of the meeting was prepared by a court reporter (insert name). Upon review by each of the states and final approval by the Compact Administration, the transcript will serve as the official minutes of the 50th Annual Meeting of the Compact Administration. Copies of the transcript may be obtained from the offices of each of the commissioners. Below is a summary of the meeting.

Introductions

The 50th Annual Meeting of the Republican River Compact Administration (RRCA) was called to order by Chair Dick Wolfe at 9:15am on August 12th, 2010, at the Burlington Community and Education Center in Burlington, Colorado. Commissioner Wolfe welcomed everyone in attendance. Each Commissioner introduced staff in attendance and members of the audience introduced themselves. Attendees included:

<u>Name</u>	<u>Representing</u>
Dick Wolfe	Colorado Commissioner, Chair
Brian P. Dunnigan	Nebraska Commissioner
David W. Barfield	Kansas Commissioner
Peter Ampe	Colorado Attorney General's Office
Megan Sullivan	Colorado Division of Water Resources
Chris Grunewald	Kansas Attorney General's Office
Burke Griggs	Kansas Department of Agriculture
Scott Ross	Kansas Department of Agriculture
Chris Beightel	Kansas Department of Agriculture
Justin Lavene	Nebraska Attorney General's Office
Jim Schneider	Nebraska Department of Natural Resources
Tom O'Connor	Nebraska Department of Natural Resources

A list of attendees recorded on the attendance sheets or by introduction is attached as Exhibit A.

Modification and Approval of Agenda

Commissioner Wolfe noted two modifications to the agenda. The first modification changed Item 3 from "approval of previous annual and special meeting reports" to "status." The second modification added a motion to dissolve the ad hoc legal committee (Item 8(c)). Commissioner Barfield moved to adopt the amended agenda. Commissioner Dunnigan seconded and the motion was approved unanimously.

A copy of the amended agenda is attached as Exhibit B

Status of Previous Annual and Special Meetings Reports and Transcripts from 2008 and 2009

Draft reports and transcripts from the 2008 and 2009 meetings of the RRCA were provided to each state. Due to time constraints, a thorough review had not been completed. The RRCA anticipated that this item would be taken up for action for approval at the next meeting.

Report of the Commissioner from Nebraska

Commissioner Dunnigan reported that using current accounting procedures, Nebraska had a positive five-year average for the period ending in 2009. Commissioner Dunnigan reported that based on preliminary estimates, Nebraska will again be in compliance with the Republican River Compact for the five-year compliance period ending in 2010. Commissioner Dunnigan stated that compliance was a testament to the work conducted in partnership with Nebraska's Natural Resource Districts (NRDs), its surface water users, and the people of the Republican River Basin. Commissioner Dunnigan also indicated that Nebraska will continue to remain in compliance with the Republican River Compact.

Commissioner Dunnigan noted that the primary Natural Resource Districts (NRDs), in partnership with the Nebraska Department of Natural Resources, revised the Integrated Management Plans (IMPs) that have been in place for two and one-half years. Commissioner Dunnigan indicated that the IMPs are working and highlighted that under the IMPs, each of the NRDs cannot deplete more than their share of the water in the Republican River Basin. The revised IMPs contain an in-depth monitoring plan which includes a comprehensive forecasting mechanism designed to predict the compliance outcome for Nebraska in dry years. The IMPs also contain detailed descriptions of the triggers to indicate when additional management actions are needed. Responsibility for the additional management actions depends on the current situation in each NRD, who share projected shortfalls and are required to implement the necessary controls to ensure Nebraska's compliance. Finally, the IMPs provide for an occupation tax and the framework for Nebraska to continue to manage consumptive use.

Commissioner Dunnigan reported that the States of Colorado, Kansas, and Nebraska spent considerable time and effort to discuss concerns related to the Colorado Compliance Pipeline and Nebraska's Crediting Issue, both of which were subject to the arbitration process. Nebraska also met with the U. S. Bureau of Reclamation (USBR) to address concerns related to the revised IMPs and Commissioner Dunnigan reported that considerable progress was made in clearing up misunderstandings.

Commissioner Dunnigan stated that Nebraska will continue to work closely with surface and ground water users to develop conjunctive management strategies that benefit all users, where NRDs, Irrigation Districts, and the USBR will play an important role in implementation.

Commissioner Dunnigan noted that Nebraska will also continue participation in Conservation Reserve Enhancement Programs (CREP), the Environmental Quality Incentive Program (EQIP), and other incentive based management programs. Commissioner Dunnigan reported that Nebraska will continue to explore stream augmentation options and indicated that vegetation management has increased stream flow and the capacity of the stream channel.

Commissioner Dunnigan concluded that Nebraska will continue to comply with the Republican River Compact and the State will continue to evaluate the needs of the basin and make changes as necessary to stay in compliance in the spirit of openness transparency and partnership. Noncompliance is not an option for the State of Nebraska.

Commissioner Dunnigan introduced Tom O'Connor from the Department of Natural Resources. Mr. O'Connor reported on the water administration activities in Nebraska for calendar year 2009. In summary, activities included issuance of closing notices for failure to submit water use reports, issuance of various pumping schedules, regulating notices and closing notices to water users associated with Meeker-Driftwood Canal, Red Willow Canal, Cambridge Canal, and Frenchman-Cambridge, Frenchman Valley and H&RW Irrigation Districts, as well as opening and closing notices to various storage permit holders. In addition, letters were sent to junior permit holders downstream in Harlan County Reservoir stating that the USBR predicted that 2010 will not be a water short year.

Report of the Chair from Colorado

Commissioner Wolfe reported that although Colorado was not in compliance with the Republican River Compact, Colorado is making great strides in trying to reach compliance. Colorado could not have made these strides without the collaborative efforts of the water users in the basin, the Republican River Water Conservation District (RRCWD), and the respective groundwater management districts. Commissioner Wolfe also expressed his appreciation for the efforts by both the States of Kansas and Nebraska in trying to reach resolution on Colorado's Compact Compliance Pipeline.

Commissioner Wolfe provided a snapshot of Colorado's hydrographic conditions in the Republican River Basin indicating that streamflows, while improving from the 2002 drought, were still below the period of record averages. Commissioner Wolfe also reported on activity at Bonny Reservoir, from which a total of 3,554 acre-feet was released over three separate periods during the 2009 calendar year. These releases were made in an effort to aid Colorado in compact compliance.

The collaborative efforts made by Colorado towards compact compliance included the RRCWD's CREP and EQIP programs. As of 2009, more than 19,600 acres were retired under the CREP program and over 10,700 under EQIP. Another 830 acres were enrolled in the Agricultural Water Enhancement Program (AWEP), a continued version of EQIP. As of 2010, approximately 10,000 acres were still available under the 2006 CREP program. A CREP amendment was also under consideration in Colorado, which was under the Environmental Assessment process and if approved will add up to 25,000 more acres.

Commissioner Wolfe noted that the RRCWD also purchased the majority of surface water diversions in the Republican River Basin, effectively retiring those lands historically irrigated by surface water. This effort led to a result of very little active surface water irrigation in Colorado.

Commissioner Wolfe reported that in 2008, measurement rules were adopted by Colorado which required by March 1, 2009, the installation of a measurement device on all of the approximately 4,000 high-capacity wells, or in the alternative, the well must be declared inactive. Calendar year 2009 was the first year of the program.

Finally, Commissioner Wolfe reported that legislation was enacted to aid the State Engineer in enforcement actions, not only in the Republican Basin, but statewide. The new legislation allows for the

assessment of a \$500 per day fine that was previously exclusive to ground water violations. The \$500 per day fine can now be assessed for surface water violations.

Report of the Commissioner from Kansas

Commissioner Barfield noted two significant anniversaries for 2010. The first was the 75th anniversary in May of 2010 of the devastating flood of 1935, which had a profound impact on all three states. Secondly, Commissioner Barfield observed that the August 2010 meeting was the 50th annual meeting of the RRCA.

Commissioner Barfield reported that Kansas is in compliance with all tests of compliance under the Final Settlement Stipulation (FSS). Kansas was also fully metered within the Republican River Basin and all meters had been inspected.

Commissioner Barfield noted that climate conditions in 2009 had improved over recent years. Precipitation in Kansas was generally good, with streamflow and reservoir levels at normal or above.

Commissioner Barfield reported that the Kansas State Government experienced significant budget shortfalls, totaling about a billion dollars, requiring a significant reduction in Kansas' activities and staffing. Included in the reduction of services was the elimination of the Water Right Conservation Program, which allowed a water user to contract with the Chief Engineer so as to temporarily not use a water right but preventing abandonment. In addition, staff positions for safety inspections of dams were eliminated and the responsibility of the inspections returned to the owners of the dams.

In regards to regulations, Commissioner Barfield reported that he enacted a number of significant changes to rules and regulations related to water administration. Specifically, regulations were established outlining procedures for special hearing processes in relation to Intensive Groundwater Use Control Areas (IGUCAs). Commissioner Barfield also reported that regulations on impairment investigations for groundwater systems were in development.

Commissioner Barfield provided an update on the Arkansas Compact, noting that the litigation that was initiated in 1985 was concluded in 2009 when the States of Kansas and Colorado agreed on some updates to the Colorado Use Rules. The two States jointly filed a motion with the Supreme Court to conclude that litigation. In 2010, the Compact Administration updated its 1980 Operating Plan to reflect the numerous agreements the two States had negotiated over recent years. Also, that Colorado State Engineer Dick Wolfe had responded to Kansas' concerns about surface water improvements in the Basin and their potential effects on Compact Compliance. Commissioner Barfield expressed Kansas' appreciation for that response. Finally, Kansas requested the Compact Administration to consider an update to the Hydrologic-Institutional Model related to groundwater irrigation return flow changes.

With respect to activities within the Republican River Basin in Kansas, Commissioner Barfield reported that the Northwest Kansas Groundwater management District No. 4 received an award for an Agricultural Water Enhancement Program grant for the USDA NRCS for \$2.6 million. The grant will allow them to convert irrigated acreage to non-irrigated land in their six designated high priority area. The GMD 4 is looking to reduce their groundwater use in some of the areas that are overappropriated, in a way that would allow those reductions to occur through the modification of their management programs and rules jointly developed between the GMD and the Kansas Division of Water Resources.

Next, Commissioner Barfield noted that Kansas submitted a motion for leave to file a petition and brief in support with the U.S. Supreme Court regarding Nebraska's non-compliance during water-short year 2006. This subject was among the disputes submitted to the RRCA in early 2008 and then submitted to non-binding arbitration in late 2008. The arbitration was concluded in August of 2009. Kansas submitted its motion under Kansas v. Nebraska, Colorado No. 126 Original, to the Supreme Court on May 3, 2010 and Nebraska and Colorado replied in early July of 2010. As of August 2010, the Court had not indicated as to whether it intends to take the case.

Commissioner Barfield reported that in 2010 the RRCA States concluded two more arbitrations. The first, concerned Colorado's augmentation proposal and the second, Nebraska's crediting proposal. The States retained Ms. Martha Pagel of Scheabe, Williamson & Wyatt of Portland Oregon to arbitrate both disputes. On May 5, 2010 Ms. Pagel heard oral arguments regarding legal motions and ruled on those motions May 17, 2010. Arbitration trials were held in Kansas City, Kansas July 12-14, 2010. A final decision on both disputes was to be issued no later than September 30, 2010.

Commissioner Barfield then responded to the report by the Commissioner from Nebraska, stating that Kansas agreed with Commissioner Dunnigan that compliance is not an option but a requirement. However, Kansas had concerns whether the current plan of the IMPs will accomplish what was asserted as, from Kansas' viewpoint, Nebraska's IMPs don't appear to bring the kind of certainty that Kansas expects with regard to future compliance during critical periods. Commissioner Barfield continued, indicating that Kansas sees Nebraska's current compliance to be significantly influenced by the wet hydrology of the recent years. Commissioner Barfield expects that when it turns dry again, with higher depletions, more problems will result. Commissioner Barfield recognized that Nebraska is seeking to find a solution to the problem and that Colorado is also working to find a solution to its compliance problems and Kansas will continue to work with both States to address these issues and concerns.

Report by the U. S. Bureau of Reclamation

The U.S. Bureau of Reclamation (USBR) report was given by Mr. Marv Swanda of the McCook office. Mr. Swanda highlighted the USBR's operation in 2009 within the Republican River Basin:

- Precipitation measured at the USBR's reservoirs varied from 78% of normal at Lovewell to 136% of normal at Swanson Lake.
- Inflows varied from 51% of the most probable at Enders to 118% of the most probable at Harry Strunk.
- Water supplies for irrigation districts ranged from zero inches at H&RW to 6½ inches at Kansas Bostwick.
- Precipitation at Bonny Reservoir totaled 26 inches and was about 155% of normal. The greatest ever recorded at the dam. The annual computed inflow of 11,700 acre-feet for Bonny was very close to the normal year forecast. River releases were made in May, June, and December in accordance with orders from the State of Colorado for compact compliance. A total of 3,361 acre-feet of river outflow was recorded.
- At Enders, the annual precipitation totaled just over 29 inches, about 156% of normal and the greatest ever recorded for that site. Reservoir levels began 21 feet below the top of the conservation pool and no water was released.

- At Swanson Lake, the annual precipitation totaled just over 27 inches, about 136% of normal. Inflow of about 37,000 acre-feet was slightly above normal-year forecast. Irrigation diversions were made into the Meeker-Driftwood Canal for the Frenchman-Cambridge Irrigation District; the first time since 2002.
- Precipitation at Hugh Butler Lake totaled about 24 inches which was 122% of normal. Reservoir levels peaked at just 4½ feet below full and irrigation releases were made. Discovery of cracks in the embankment resulted in the evacuation of 21,000 acre-feet from Hugh Butler Lake.
- At Harry Strunk, annual precipitation totaled 29 inches which is 140% of normal. The reservoir level at the beginning of 2009 was just less than a foot below the top of the conservation pool. The reservoir was allowed to fill in April to over one foot into the flood pool prior to irrigation. Late fall/early winter inflows increased the level back to one half of a foot below the top of the conservation pool.
- Precipitation at Keith Sebelius Lake totaled 32 inches which is 131 percent of normal. Irrigation releases were made for the Almena Irrigation District.
- At Harlan County, the 2009 inflow of just over 136,000 acre-feet was between normal and wet-year forecast. At the beginning of 2009, the levels were less than a half a foot below the top of the conservation pool. Flood releases were made during the first three months of the year and the reservoir elevation was about half a foot into the flood pool at the end of the year.
- For Lovewell, precipitation totaled 21 inches which was 78% of normal. Reservoir elevation at the beginning of 2009 was 1½ feet below the top of the conservation pool. The pool level increased which the conservation space filled in March.

Mr. Swanda also reported on the current operations at USBR reservoirs:

- At Bonny Reservoir, the reservoir level was 18 feet below the top of the conservation pool. Eleven inches of precipitation was recorded in the first six months of 2010, which is 124% of average. Reservoir inflow for the period was the greatest since 2001 but half of the historic average. Releases were made to the Hale Ditch and for compact compliance.
- Swanson Lake was nine feet from full and approximately four feet higher than the previous year. Frenchman-Cambridge was again irrigated from Swanson Lake.
- Enders Reservoir was 20 feet below full. H&RW was not irrigating for the ninth year in a row and Frenchman Valley Irrigation District did not receive irrigation water for the seventh consecutive year.
- Hugh Butler Lake was 28 feet below full and received 15 inches of precipitation which was 156% of normal.
- Harry Strunk was near the top of conservation with precipitation 133% of normal.
- Keith Sebelius was six feet below full with some limited irrigation releases. Precipitation was 19 inches or 153% of normal.
- Harlan County water surface levels were just about conservation pool, just into the flood pool. USBR calculated that 2010 was not a water shortage year.
- Lovewell recorded about 18 inches of precipitation during the first six months of the year, 133% of average. Irrigation releases continued during the summer.

Finally Mr. Swanda touched on some safety-of-dams issues:

- At Norton Dam, the safety-of-dams work that began in 2007 was completed in 2009.
- At Enders Dam, a small depression was discovered in 2004 and work continues to remedy the situation.
- At Red Willow, in late October a sinkhole and subsequently transverse cracking in the embankment was discovered, which resulted in a reservoir restriction of an elevation of 2552 to 2554, just above the dead pool. The USBR began a Corrective Action Study to determine what alternatives are available to fix the dam.

The USBR's operations report is attached as Exhibit C.

Report by the Army Corps of Engineers

The report for the Army Corps of Engineers (Corps) was provided by Edward Parker, the lead hydrologist for the water management sector in the Kansas District.

Mr. Parker reported on activities for Harlan County Reservoir and the Lovewell project on White Rock Creek in Kansas:

- For Harlan County the Corps conducted a study on channel capacity. Since the 1950's, channel capacity declined from 4,000 cfs to around 2,000 cfs in 1997. Due to the extended drought, no releases were made from 1998 through 2007. With the condition of the project lately focused on storage, more so than in past years, the Corps took the opportunity to determine the current channel capacity. During March for a two week period, 1,000 cfs was released with no significant damage downstream.
- On Lovewell Reservoir, the Corps modified the water control manual to permit during water short years, pursuant to a formal agreement with the USBR, excess storage up to 2 feet, for irrigation benefits. The amount of water allowed is based on the operating plan for Harlan County.

Report by the U.S. Geological Survey

Mr. John Miller reported on the activities of the U.S. Geological Survey (USGS) in the Republican River Basin, for 2009. Mr. Miller provided a packet containing the annual data report published by the USGS and all of the graphs presented at the meeting.

Mr. Miller presented the annual mean discharge data for fifteen sites in the Republican River Basin. Ten of the fifteen sites are Compact gages funded through the USGS NSIP program. The Compact gages were: the Arikaree River at Haigler, the North Fork of the Republican at the Colorado State Line, Buffalo Creek near Haigler, Rock Creek at Parks, South Fork of the Republican near Benkelman, Frenchman Creek at Culbertson, Driftwood Creek near McCook, Red Willow Creek near Red Willow, Sappa Creek near Stamford and the Courtland Canal, Nebraska-Kansas State Line. Mr. Miller noted that all site were within the top ten lowest for the period of record for the annual mean discharge.

The five other sites that Mr. Miller indicated would be of interest were: the Republican River at McCook, the Republican River near Orleans, the Republican River at Stratton, Frenchman Creek at Palisade, and the Republican River at Cambridge. The last two gages are operated by the Nebraska Department of Natural Resources.

The USGS report is attached as Exhibit D.

Engineering Committee Report

Ms. Megan Sullivan of Colorado presented the Engineering Committee Report. Copies of the report were presented to the RRCA.

At the RRCA Annual Meeting on August 12, 2009, the Engineering Committee was assigned nine tasks related to compact accounting, including the completion of accounting for 2009. The Engineering Committee met several times by phone and exchanged preliminary data. However due to on-going, unresolved disputes, the accounting for 2009 was not finalized.

The Engineering Committee did reach consensus, after reviewing the accounting procedures that Kansas' groundwater CBCU variable in the Mainstem Virgin Water Supply formula was missing. The Engineering Committee recommended revisions to the accounting procedures to include this CBCU element in the Mainstem formula, as well as changes to the Frenchman and Mainstem sub-basin formulas for the return flows of the Riverside Canal. The Engineering Committee also recommended the adoption of the proposal to relocate the accounting point used in the groundwater model for the North Fork Republican River sub-basin to the Colorado-Kansas State Line.

In addition, the Engineering Committee discussed the use of provisional USGS data for the Courtland Canal, Station 06852500 as opposed to the USBR data for the same gage. The Committee recommended the use of the USGS data.

Next Mr. Jim Schneider, Nebraska's Engineering Advisor, addressed comments made by the State of Kansas regarding Nebraska's revised IMPs. Mr. Schneider indicated that the Department of Natural Resources worked collaboratively with the IMPs of the past year and spent much time conducting extensive analyses to conclude that the process within the IMPs will ensure Compact compliance for the State of Nebraska during all climatic conditions, including dry conditions. Mr. Schneider stressed that Nebraska would welcome any discussion that the State of Kansas would like to have.

Ms. Sullivan concluded the Engineering Committee report with the tasks recommended for the next year for the Engineering Committee.

The Engineering Committee's report is attached as Exhibit E.

Conservation Committee Report

Mr. Scott Gunether of the USBR regional office in Billings, Montana provided the Conservation Committee status report on the study of the effect of non-federal reservoirs and terraces. The study plan was approved by the RRCA at their annual meeting in 2004.

The study essentially utilizes a water balance model to estimate impacts of reservoirs and terraces. There are basically three elements to the water balance model. The first is the collection of input data which is complete. The second is the water balance modeling aspect. Although not yet complete, a great deal of progress has been made, including the identification of the impact of reservoirs and terraces in the field. The last element is the transfer of the impact of reservoirs and terrace to the mouth of each designated sub-basin. This is yet to be completed and requires the identification and summarization of

all land use information and practices in a particular basin, which is part of the post-processing of the model results.

A brief report was transmitted to the RRCA, giving examples of some of the results to date. This report will be posted to a website at a later date.

In regards to administrative items, the Final Settlement Stipulation (FSS) indicated that the study costs should not exceed a million dollars. The States were to be responsible for \$250,000 of that and the remainder to be from federal funds via the USBR. The three States have exceeded the \$250,000 identified in the FSS and the study costs have exceeded the \$1 million mark, mostly due to two additional, unexpected work elements, namely a survey of terrace conditions and the mapping of terrace lands in Kansas. Some additional in-kind services from the States may be incurred later in the year, specifically from participation in conference calls and other meetings.

Finally Mr. Guenther reported that the Conservation Committee does intend to document the finding of the study. Both Dr. Derrel Martin and Dr. Jim Koelliker, the principal investigators, have plans for professional paper to document the study. The Conservation Committee will also probably issue a concluding report.

Status of Dispute Resolution

Commissioner Wolfe noted that Commissioner Barfield covered the status of the Dispute Resolution in his report.

Status of 2006, 2007 and 2008 Final Accounting

Commissioner Wolfe noted that this topic was covered in the Engineering Committee report. There are some outstanding issues that are under consideration by the Committee and the Commissioners so as to reach final resolution and to ultimately seek approval of the final accounting.

Status of RRCA regulation regarding the approval of a diversion in one state that is used in another state

Mr. Burke Griggs provided an update on the Ad Hoc Legal Committee which was formed to resolve the issue of the approval of the diversion of water from one state that is used in another state. The Ad Hoc Legal Committee considered the issue and concluded that there is no clear legal resolution of it and has decided to not pursue it any further.

Status of the Lower Republican River Feasibility Study

Commissioner Barfield provided an update of the status of the Lower Republican River Feasibility Study. This study is a follow-up to the prior study that was conducted after the FSS was concluded by the States of Kansas and Nebraska and the USBR to look at alternatives for improved management in the Lower Basin, such as raising Lovewell, improving efficiencies in the canal systems and looking at other storage sites in Kansas and Nebraska in the lower part of the Republican River Basin. The follow-up study on the feasibility of the most promising alternatives has been authorized by Congress. The next step is the funding of the Federal Government 50% share, which was still pending.

Commissioner Dunnigan reported that Nebraska stands ready to support the feasibility study with funding when Federal funding comes in.

Action on Engineering Committee Report and assignments

Commissioner Wolfe called for a motion to approve the Engineering Committee report and the respective assignments.

Commissioner Dunnigan so moved and Commissioner Barfield seconded. Commissioner Barfield clarified that the RRCA was accepting the report and assigning the Engineering Committee the tasks they recommended. Commissioner Wolfe affirmed the clarification and the motion passed unanimously.

Commissioner Barfield then commented on a particular data issue in the Engineering Committee Report. Specifically, the statement where Nebraska's position is that it does not agree that the backup data in the NRDs is required in the FSS. Commissioner Barfield stated that Kansas believes that the Compact and the FSS requires disclosure for underlying data where there's a legitimate need for such. Kansas will send a formal request for that data from the NRDs in the near future with background as to why Kansas believes it is required under the FSS.

Mr. Jim Schneider of Nebraska responded to clarify that the statement in the Engineering Committee Report is simply reiterating Nebraska's position that the backup data is not required as part of the regular annual reporting. Mr. Schneider offered to work with Kansas to see if Nebraska can accommodate Kansas' request on a one-time basis as needed.

RRCA resolutions regarding changes to the RRCA's ground water model and RRCA's Accounting Procedures and Reporting Requirements

Commissioner Wolfe called for a motion to waive the 15-day notice requirement under Rule 13. Commissioner Barfield so moved and Commissioner Dunnigan seconded. The motion passed unanimously.

Commissioner Wolfe called for a motion to amend Rule 14 to reflect the date of August 13, 2011 for the revisions to the RRCA ground water model and accounting procedures if the RRCA accepts the two following procedures. Commissioner Barfield moved and Commissioner Dunnigan seconded. The motion passed unanimously.

Commissioner Wolfe read the resolution of the report from the RRCA on changes to the groundwater model. In summary, on August 13, 2008, the RRCA accepted the proposal to move the groundwater model accounting cell at Guide Rock. In addition, in its August 12, 2009 and August 12, 2010 reports, the Engineering Committee recommended that the groundwater accounting point for the North Fork sub-basin be moved to the Colorado Nebraska state line. It is the resolution of the RRCA to adopt the proposal set forth in Attachment B of the Engineering Committee 2010 report and to adopt Version 12s2 of the groundwater model to reflect these changes.

Commissioner Wolfe called for a motion to approve Version 12s2 of the RRCA groundwater model where the changes are intended to apply to the accounting years 2009 and on. Commissioner Wolfe noted that the changes are currently not applicable to unapproved accounting for prior years and each State reserves its rights as to whether it applies to prior unapproved accounting. Commissioner Dunnigan so moved and Commissioner Barfield seconded.

Commissioner Wolfe called for discussion. Commissioner Dunnigan stated that Nebraska's position going forward will be that as this body identifies an error in accounting procedures or in the

groundwater model that once those errors are identified and agreed to as errors that they should be incorporated in any accounting that has not been finalized in the past.

The motion passed unanimously.

Commissioner Wolfe read the second resolution of the RRCA regarding changes to the RRCA's Accounting Procedures and Reporting Requirements. In summary, the Engineering Committee recommended that the RRCA amend the RRCA Accounting Procedures and Reporting Requirements to correct the formulas used to compute the virgin water supply for both Frenchman and the Mainstem so as to properly account for the return flows from the Riverside Canal. The Engineering Committee also recommended amending the Accounting Procedures and Reporting Requirements to include in the formula used to compute the Mainstem Virgin Water Supply, the groundwater impacts attributed to Kansas well Pumping as calculated by the groundwater model.

Commissioner Wolfe called for a motion to approve the changes to the RRCA Accounting Procedures and Reporting Requirements where these changes are intended to apply to accounting years 2009 and on and is not currently applicable to unapproved accounting for prior years and each State reserves its arguments as to whether it applies to prior unapproved accounting. Commissioner Barfield moved and Commissioner Dunnigan seconded. The motion passed unanimously.

The RRCA Resolutions are attached as Exhibits F & G

Resolution for Lee Rolfs

Commissioner Barfield read the resolution recognizing the contributions of Lee Rolfs of Kansas. In summary: Mr. Rolfs served as legal counsel to the Division of Water Resources Kansas Department of Agriculture for over 31 years. In his capacity as legal counsel, Mr. Rolfs represented the interests of the State of Kansas and its residents of the Republican River Basin. Mr. Rolfs played a central role in litigation of Kansas v. Colorado and Nebraska, No. 126 Original and in the settlement of that litigation. Commissioner Barfield on behalf of the RRCA expressed sincerest gratitude and appreciation to Lee E. Rolfs for his excellent and dedicated service. Commissioner Barfield moved to approve the resolution and Commissioner Dunnigan seconded. The motion passed unanimously.

The RRCA Resolution is attached as Exhibit H

Motion to dissolve the Ad Hoc Legal Committee

Commissioner Wolfe called for a motion to dissolve the Ad Hoc Legal Committee. Commissioner Dunnigan so moved and Commissioner Barfield seconded. The motion passed unanimously.

Remarks from the Public

Mr. Brad Edgerton, manager for the Frenchman-Cambridge Irrigation District spoke on behalf of the District. Mr. Edgerton provided background on the Frenchman-Cambridge system and water rights. Mr. Edgerton noted that Colorado is approaching the volume of water equivalent to the contracted amount of water the District board has for Trenton Dam/Swanson Reservoir. The contracted amount is equivalent to three irrigation seasons for the 17,000 acres in the Meeker-Driftwood Canal. For six consecutive years the water users of the Meeker-Driftwood Canal had zero water available. While the District appreciates Colorado's efforts towards compliance and understands the sacrifices made, the District does not believe it is enough.

Mr. Edgerton continued, stating that the District petitioned (Nebraska) DNR to reevaluate the Republican River Basin as allowed under Nebraska statutes. The petition was denied by DNR. The

District appealed the decision, believing that the reevaluation will illustrate how far the basin is over-developed and that a sound understanding of the problem will allow Nebraska to develop reasonable management solutions.

The District believes that a sustainable supply should be the goal and Mr. Edgerton expressed the hope that the newly formed Republican River Sustainable Task Force would spread into Colorado.

Future Meeting Arrangements

Commissioner Wolfe indicated that some items such as previous annual reports and meeting reports had not been complete. In light of this a Special Meeting may take place in the fall to address these issues. The RRCA's next annual meeting will again be hosted by Colorado and will be held in Burlington, in August of 2011. The exact date will be set at a later date.

Commissioner Barfield noted that the RRCA's Rule 9 requires the regular meeting to be held prior to August 1, unless the States agree to waive the requirement. Commissioner Barfield questioned why the meeting could not be moved back to July. Commissioner Wolfe noted that past meetings were held in August because some data for the accounting was not available until the end of July. All Commissioners agreed to discuss over the next year, the possibility of holding the next annual meeting in July.

Adjournment

Commissioner Wolfe called for a motion to adjourn. Commissioner Dunnigan so moved and Commissioner Barfield seconded. The motion passed unanimously. The meeting adjourned at 11:28 am.

Dick Wolfe, Chair, Colorado Commissioner

David W. Barfield, Kansas Commissioner

Brian Dunnigan, Nebraska Commissioner

Exhibits

- Exhibit A: List of meeting attendees
- Exhibit B: Agenda
- Exhibit C: USBR Operations Report
- Exhibit D: USGS Report
- Exhibit E: Engineering Committee Report

- Exhibit F: RRCA Resolution regarding Changes to the RRCA's Accounting Procedures and Reporting Requirements
- Exhibit G: RCA Resolution regarding Changes to the RRCA Ground Water Model
- Exhibit H: RRCA Resolution honoring Lee R. Rolfs

2010 Nebraska Report to the RRCA

2010 NEBRASKA REPORT
for the
Republican River Compact Administration
August 12, 2010

I am pleased again this year to inform all of you that the State of Nebraska is in compliance with the Republican River Compact. Using current accounting procedures, Nebraska has a positive five-year average for the period ending in 2009. Based on preliminary estimates, it appears Nebraska will again be in compliance for the five-year compliance period ending in 2010. This is a testament to the work conducted to date in partnership with Nebraska's Natural Resources Districts, its surface water users and the people of the Republican River Basin.

In the future, Nebraska will continue to remain in compliance with the Republican River Compact. The primary NRDs, in partnership with the Department of Natural Resources, have revised the Integrated Management Plans in place for two and a half years. These IMPs are working. Among other things, the IMPs clearly state that each of the NRDs cannot deplete more than their share of the water of the Basin. This is not merely a goal, but rather a requirement of each plan.

I have previously stated "the Department and the Natural Resources Districts feel that it is important to investigate other options and further regulations that can be incorporated into future plans addressing water short years." In the first week of August, the State of Nebraska along with the Upper and Middle Republican Natural Resources Districts successfully adopted revisions to the existing Integrated Management Plans. These revisions address the concerns of long term compliance brought up during the 2008 arbitration. The revised plans now contain an in-depth monitoring plan, including a comprehensive forecasting mechanism that now allows Nebraska to look ahead and anticipate compliance issues, rather than waiting until six months after a year is over to see the results of Compact accounting. This forecast is designed to predict the compliance outcome for Nebraska if dry conditions are experienced in the upcoming year, and accurately predicts when those potential dry conditions would require additional actions by Nebraska to remain in compliance. The revised plans contain a detailed description of the triggers that will indicate when additional management actions are needed. The responsibility for the needed management actions depends on the current situation in each NRD, and those NRDs with a share in any projected shortfall will be required to implement the necessary controls that will ensure Nebraska's compliance in dry periods. Finally, the plans also provide for an occupation tax in these NRDs and the additional framework for Nebraska to continue to manage consumptive use over the long term to meet compact compliance.

During the first half of this year, the States of Colorado, Kansas, and Nebraska spent considerable time and effort to address concerns related to the Colorado Compliance Pipeline and Nebraska's Crediting Issue through the arbitration process. We consider both of these issues to be of importance and look forward to their resolution. The Department has also held recent meetings with the Bureau of Reclamation to address their misunderstandings of the revised IMPs, and we have made considerable progress in the last two weeks.

In order for Nebraska to utilize its Compact allocation to the benefit of the entire basin, we will need to work closely with both surface water and groundwater users to develop conjunctive management strategies that benefit all water users. We will continue to see improvements over time as the IMPs continue to take hold. It is our belief that a healthy surface water system will contribute to Nebraska's ability to comply with the Compact. Conjunctive management studies that identify the best uses of those streamflow supplies during wet and dry conditions will further enhance Nebraska's ability to fully utilize its Compact allocation while also continuing to ensure Compact compliance. The natural resources districts, the irrigation districts, and their respective boards, and the Bureau of Reclamation will play an important role in implementing these strategies in the basin.

The future also holds continuing participation in the Conservation Reserve Enhancement Program and the Environmental Quality Incentives Program and other incentive based management strategies. Nebraska continues to explore stream augmentation options. Vegetation management has increased streamflow and the capacity of the stream channel. Nebraska will continue to take an active role in the Engineering Committee, and will always work with the other states to improve existing accounting methods and ensure they accurately reflect water use in the Basin.

In closing, I wish to assure you all, as well as my counterparts from our neighboring states, that Nebraska will continue to comply with the Republican River Compact. The State will continue to evaluate needs of the basin and make changes as necessary to stay in compliance, in a spirit of openness, transparency, and partnership. We expect to continue to work with all stakeholders in the basin, including the other states, the NRDs, the surface water districts and individual users, and the Bureau of Reclamation. Non-compliance is not an option for the State of Nebraska.

**REPORT OF WATER ADMINISTRATION ACTIVITIES FOR THE REPUBLICAN RIVER
BASIN IN NEBRASKA FOR THE CALENDAR YEAR 2009**

January 14, 2009

Fifty-three (53) letters were sent to irrigators reminding them that 2008 Water Use Reports must be filed with Cambridge Field Office.

February 26, 2009

Fifteen (15) closing notices were issued to water users that failed to submit their required annual Water Use Reports, which were to be filed by December 31 of each year. These water users were not allowed to divert water during the 2009 calendar year.

June 24, 2009

One (1) Notice (Pumping schedule) was sent to a water user notifying them of the amount they could legally divert.

June 26, 2009

One (1) regulating notice was sent to water a user notifying them that they were not allowed to divert water in excess of the amount of their appropriation without prior consent.

June 29, 2009

Seventeen (17) closing notices were issued to water users above Meeker-Driftwood Canal, notifying them that they shall not divert water until further notice.

June 29, 2009

One (1) regulating notice was sent to water a user notifying them that they were not allowed to divert water in excess of the amount given in their appropriation without prior consent.

July 6, 2009

One (1) regulating notice was sent to a water user notifying them that they were not allowed to divert water in excess of the amount of their appropriation without prior consent.

July 6, 2009

Eight (8) closing notices were issued to water users above Red Willow Canal, notifying them that they shall not divert water until further notice.

July 8, 2009

Twenty-six (26) regulating notices were sent to water users above Cambridge Canal, notifying them that they were not allowed to divert water in excess of the amount of their appropriation without prior consent.

July 8-9, 2009

Thirty (30) closing notices were issued to water users above Cambridge Canal and Meeker-Driftwood Canal notifying them that they shall not divert water until further notice.

July 9, 2009

Sixteen (16) closing notices were issued to storage permit holders above Harry Strunk Lake, notifying them that no water can be impounded in their holding facility until further notice.

July 16, 2009

Thirty-one (31) regulating notices were sent to water users above Cambridge Canal, notifying them that they were not allowed to divert water in excess of the amount of their appropriation without prior consent.

August 6, 2009

Four (4) regulating notices were sent to Frenchman Cambridge and Frenchman Valley-H&RW Irrigation Districts, water users notifying them that they were not allowed to divert water in excess of the amount of their appropriation without prior consent.

August 6, 2009

Eighteen (18) closing notices were issued to water users above Bartley and Red Willow Canal notifying them that they shall not divert water until further notice.

August 26-31, 2009

Thirty-six (36) regulating notices were sent to water users above Bartley, Red Willow, and Meeker-Driftwood Canals, notifying them that they were not allowed to divert water in excess of the amount given of their appropriation without prior consent.

September 10, 2009

One (1) opening notice was sent to a storage permit allowing them to store water in the reservoir.

November 2, 2009

Two (2) opening notices were sent to storage permits allowing them to store water in reservoirs.

November 18, 2009

Letters were sent to the junior permit holders downstream of Harlan County Reservoir stating the U.S. Bureau of Reclamations prediction that 2010 will not be a water short year.

November 18, 2009

Water Use Report forms were sent out to all private water use permit holders in the Republican River Basin.

2010 NEBRASKA REPORT
for the
Republican River Compact Administration
August 31, 2011

The State of Nebraska is in compliance with the Republican River Compact. Using current accounting procedures, Nebraska has had positive balances during 2007, 2008, 2009 and 2010 which has led to compliance with the five year average. Based on preliminary estimates, Nebraska will again be in compliance for the five-year period ending in 2011.

In the future, Nebraska will continue to remain in compliance with the Republican River Compact. The Upper Republican, Middle Republican, and most recently the Lower Republican Natural Resources District boards have all voted to adopt a third generation of integrated management plans. These plans were modified from the previous version to address concerns of water-short year compliance brought up during the 2008 arbitration. These plans also further solidify Nebraska's long-term commitment to Compact compliance.

The basin NRDs have demonstrated an on-going commitment to compliance through the adoption of this third generation integrated management plan. All of the integrated management plans adopted by the basin NRDs contain controls that would require, when necessary, the shutdown of wells in rapid response areas during water-short years as part of compliance efforts as well as provisions to administer streamflows in a manner that will ensure Nebraska maintains compliance. The integrated management plans also contain provisions to continue to reduce groundwater pumping volumes and conduct evaluations annually to determine if additional long-term pumping adjustments are necessary.

The updated integrated management plans incorporate complex forecasting and triggers that rely on conservative dry-year projections to proactively identify the potential for non-compliance, thereby providing the necessary information to proactively reduce consumption to levels necessary to ensure Compact compliance. These triggers go well beyond the requirements imposed by the Compact and FSS because Nebraska knows that future non-compliance is not an option. Nebraska understands that Kansas may have concerns about the implementation of these most recent integrated management plans and would once again invite constructive dialog through the Engineering Committee to discuss any such concerns.

The Department also continues to work with the Tri-Basin NRD to finalize an integrated management plan. While not a necessary component to ensure Compact compliance, this plan will among other objectives, require the NRD to limit groundwater depletions to the same volume as groundwater imports.

The Republican River Sustainability Task Force continues to meet. The purpose of the 27 member Republican River Basin Water Sustainability Task Force is to define water sustainability for the Republican River Basin, develop and recommend a plan to help reach

water sustainability in the basin, and develop and recommend a plan to help avoid a Water-Short Year in the basin. The Task Force will be working to summarize their efforts in a report to the legislature.

Nebraska continues to invest in long-term solutions to reduce consumptive use in the basin. State and local NRD financial resources continue to be invested in CREP and AWEP programs. These programs have worked to provide permanent and temporary reductions in irrigated lands throughout the basin. Nebraska also continues to invest in the science necessary to support future sound management decisions. This work has included: 1) the development of a wide array of management tools; 2) specific evaluations of augmentation sites throughout the basin; and 3) the evaluation of riparian vegetation on water supplies, just to name a few.

The department is also pursuing efforts in coordination with the Nebraska Republican River Management Districts Association to develop modeling tools to support the evaluation of potential conjunctive management options throughout the basin. The Department continues to be open to working with the other states through the Water SMART Basin Studies program to develop these tools, and believes that such collaboration is called for pursuant to section IV.E. of the Final Settlement Stipulation.

In closing, I reiterate that Nebraska will continue to comply with the Republican River Compact. The State will continue to proactively evaluate the basin and make the necessary changes to remain in compliance. We will continue to work with all stakeholders in the basin, including the other states, the NRDs, the surface water districts and individual users, and the Bureau of Reclamation.

**REPORT OF WATER ADMINISTRATION ACTIVITIES FOR THE REPUBLICAN
RIVER BASIN IN NEBRASKA FOR THE CALENDAR YEAR 2010**

January 19, 2010

Letters were sent to irrigators reminding them that 2009 Water Use Reports must be filed in the Cambridge Field Office.

February 16, 2010

Fifteen (15) closing notices were issued to water users that failed to submit their required annual Water Use Reports, which were to be filed by December 31 of each year. These water users were not allowed to divert water during the 2010 calendar year.

May 17, 2010

One (1) regulating notice was sent to Riverside Canal notifying them that they were not allowed to divert water in excess of the amount of their appropriation without prior consent.

June 28, 2010

Six (6) regulating notices were sent to water users above Meeker-Driftwood Canal notifying them that they were not allowed to divert water in excess of the amount of their appropriation without prior consent.

June 28, 2010

Thirty-eight (38) closing notices were issued to water users above Meeker-Driftwood Canal, notifying them that they shall not divert water until further notice.

July 7, 2010

One (1) Notice (Pumping schedule) was sent to a water user notifying them of the amount they could legally divert.

July 16, 2010

One (1) regulating notice was sent to Riverside Canal notifying them that they were not allowed to divert water in excess of the amount of their appropriation without prior consent.

July 19, 2010

One (1) Notice (Pumping schedule) was sent to a water user notifying them of the amount they could legally divert.

August 2, 2010

One (1) regulating notice was sent to Riverside Canal notifying them that they were not allowed to divert water in excess of the amount of their appropriation without prior consent.

Aug 2, 2010

Thirty-seven (37) open/regulating notices were issued to water users above Meeker-Driftwood Canal notifying them that they were not allowed to divert water in excess of the amount of their appropriation without prior consent.

Aug 2, 2010

Six (6) Regulating notices were issued to water users above Meeker-Driftwood Canal notifying them that they were not allowed to divert water in excess of the amount of their appropriation without prior consent.

Aug 2, 2010

Two (2) Notices (Pumping schedule) were sent to water users notifying them of the amount they could legally divert.

Aug 3, 2010

One-hundred five (105) closing notices were issued to water users above Cambridge Canal, notifying them that they shall not divert water until further notice.

August 3, 2010

Thirty nine (39) regulating notices were sent to water users above Cambridge Canal, notifying them that they were not allowed to divert water in excess of the amount of their appropriation without prior consent.

August 4, 2010

One (1) Notice (Pumping schedule) was sent to a water user notifying them of the amount they could legally divert.

August 8, 2010

Twenty nine (29) closing notices were issued to water users above Meeker Driftwood Canal notifying them that they shall not divert water until further notice.

Aug 9, 2010

Fifty eight (58) open/regulating notices were sent to water users above Cambridge Canal, notifying them that they were not allowed to divert water in excess of the amount given of their appropriation without prior consent.

August 9, 2010

Four (4) regulating notices were sent to Frenchman Cambridge and Frenchman Valley-H&RW Irrigation Districts, notifying them that they were not allowed to divert water in excess of the amount of their appropriation without prior consent.

August 13, 2010

Two (2) regulating notices were sent to Frenchman Cambridge Irrigation District notifying them that they were not allowed to divert water in excess of the amount of their appropriation without prior consent.

August 23, 2010

Eight (8) closing notices were issued to water users above Meeker Driftwood canal notifying them that they shall not divert water until further notice.

August 23, 2010

One (1) regulating notice was sent to Frenchman Cambridge Irrigation District notifying them that they were not allowed to divert water in excess of the amount of their appropriation without prior consent.

August 26, 2010

One water appropriation was cancelled above Swanson Reservoir.

September 3, 2010

Thirty-seven (37) opening/regulating notices were issued to water users above Meeker-Driftwood Canal notifying them that they were not allowed to divert water in excess of the amount of their appropriation without prior consent.

September 3, 2010

Six (6) regulating notices were sent to water users above Meeker-Driftwood Canal, notifying them that they were not allowed to divert water in excess of the amount given of their appropriation without prior consent.

November 1, 2010

Ten (10) Opening notices were sent to reservoirs notifying them that they may store water.

December 2010

Mailed water user reports to water appropriations in the Republican River Basin. These are to be filed in the Cambridge Field Office by December 31 of each year.

Engineering Committee Report

Republican River Compact Administration

August 12, 2010

ASSIGNMENTS

At the August 12, 2009 Annual Meeting of the Republican River Compact Administration, the Commissioners assigned the Engineering Committee the following tasks:

1. Finalize work on a user's manual for the Republican River Compact *Accounting Procedures and Reporting Requirements* (RRCA Accounting Procedures, dated July 27, 2005) and provide a recommendation to the Administration for adoption at next year's annual meeting.
2. Complete exchange of data requested by Kansas in its August 1, 2008 and July 17, 2009 letters by October 1, 2009.
3. Exchange by April 15, 2010 the information listed in Section V of the RRCA Accounting Procedures and Reporting Requirements, and other data required by that document. By July 15, 2010 the states will exchange any updates to these data.
4. Continue to review Colorado's augmentation proposal, as appropriate.
5. 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. Within 90 days, the states will exchange information and the Engineering Committee will meet to recommend next steps.
6. Develop a revision to the RRCA's Accounting Procedures to reflect agreements by the RRCA at its 2008 and 2009 annual meetings, and provide the RRCA with a recommendation of any appropriate formatting changes.
7. Retain Principia Mathematica to perform on-going maintenance of the ground water model and periodic updates requested by the Engineering Committee.
8. Continue development of a five-year accounting spreadsheet/database for adoption at the 2010 annual meeting or earlier.
9. Review accounting procedures to determine if Kansas groundwater CBCU in the Mainstem is properly included in the Mainstem virgin water supply calculation and if necessary, provide a recommendation to the RRCA at the next annual meeting.

WORK ACTIVITIES RELATED TO THESE ASSIGNMENTS AND OTHER ISSUES

The Engineering Committee and technical representatives from the States of Colorado, Kansas, and Nebraska participated in several collaborative work activities and phone conferences and the following assignments and work activities were completed:

1. **Complete the user's manual for accounting procedures and provide a resolution for its adoption.**
 - a) The States reviewed the 2006 draft initiated by Kansas and provided comments. However, a final draft of the manual was not completed; the assignment should be continued next year.
2. **Complete exchange of data requested by Kansas in its August 1, 2008 and July 17, 2009 letters by October 1, 2009.**
 - a) *Placeholder for status of Nebraska data.*
 - b) *Placeholder for status of Colorado meter data*
3. **Exchange by April 15, 2010 the information listed in Section V of the RRCA Accounting Procedures and Reporting Requirements, and other data required by that document. By July 15, 2010 the states will exchange any updates to these data.**
 - a) Each state exchanged its model data sets by April 15, 2010 or shortly thereafter. A preliminary run of the RRCA groundwater model was developed by Willem Schreuder of Principia Mathematica and posted on the RRCA web site he maintains for the Administration.
 - b) The States exchanged their available final data by August 3, 2010, and Willem Schreuder of Principia Mathematica completed a run based on this data on August 3, 2010.
 - c) *Placeholder for status of final accounting*

- d) Data sets were collected by the Committee for stream flow, climate information, diversion records, and reservoir evaporation records of the three states in cooperation with the U.S. Geological Survey, U.S. Bureau of Reclamation, and U.S. Army Corps of Engineers for 2009.
4. **Continue to review Colorado's augmentation proposal, as appropriate.**
 - a) Proposal is the subject of an arbitration process. No additional information was discussed.
5. **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. Within 90 days, the states will exchange information and the Engineering Committee will meet to recommend next steps.**
 - a) Each state performed a cursory review of their respective engineering repositories for published studies/information pertaining to ground water irrigation recharge. Neither Nebraska nor Colorado found any pertinent information. Kansas assembled a bibliography of possible studies/information; however no additional progress has been made on this assignment.
6. **Develop a revision to the RRCA's Accounting Procedures to reflect agreements by the RRCA at its 2008 and 2009 annual meetings, and provide the RRCA with a recommendation of any appropriate formatting changes.**
 - a) A revised accounting procedures was drafted to reflect:
 - Changes to both the Frenchman sub-basin and the Mainstem formulas pertaining to the return flows from the Riverside Canal.
 - Changes to the Mainstem formula to include missing Kansas ground water CBCU in the Virgin Water Supply calculations.
7. **Retain Principia Mathematica to perform on-going maintenance of the ground water model and periodic updates requested by the Engineering Committee.**
 - a) Each state separately contracted with Principia Mathematica.
8. **Continue development of a five-year accounting spreadsheet/database for adoption at the 2010 annual meeting or earlier.**
 - a) The assignment was not completed; the assignment should be continued next year.
9. **Review accounting procedures to determine if Kansas groundwater CBCU in the Mainstem is properly included in the Mainstem virgin water supply calculation and if necessary, provide a recommendation to the RRCA at the next annual meeting.**
 - a) Based on a review of the accounting procedures, the Engineering Committee confirmed that Kansas groundwater CBCU was missing from the Mainstem Virgin Water Supply calculations. The accounting procedures were revised to

reflect the inclusion of this CBCU element in the Mainstem formula and the Engineering Committee recommends adoption of this change.

COMMITTEE RECOMMENDATION

The Committee recommends the adoption of the revisions to the Accounting Procedures that reflect the changes to the Frenchman and Mainstem subbasin formulas for the return flows of the Riverside Canal and the change to the Mainstem subbasin formula to include Kansas groundwater CBCU, as described in attachment A

The Committee recommends the adoption of the proposal to relocate the accounting point used in the RRCA groundwater model for the North Fork Republican River sub-basin to the Colorado – Nebraska state line in accordance with Art. III of the Compact, as discussed in attachment B.

RECOMMENDED ASSIGNMENTS FOR THE COMING YEAR

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

1. Finalize work on a user's manual for the RRCA Accounting Procedures and provide a recommendation to the Administration for adoption at next year's annual meeting or earlier.
2. Exchange by April 15, 2011 the information listed in Section V of the RRCA Accounting Procedures and Reporting Requirements, and other data required by that document. By July 15, 2011 the states will exchange any updates to these data.
3. Continue efforts to resolve concerns related to varying methods of estimating ground and surface water irrigation recharge and return flows within the Republican River Basin and related issues.
4. Retain Principia Mathematica to perform on-going maintenance of the ground water model and periodic updates requested by the Engineering Committee for calendar year 2011. The billable costs shall be limited to actual costs incurred, not to exceed \$15,000 in total and will be apportioned in equal 1/3 amounts to the States of Colorado, Kansas, and Nebraska respectively.
5. Continue development of a five-year accounting spreadsheet/database for adoption at the 2011 annual meeting or earlier.
6. Continue to review Colorado's augmentation proposal, as appropriate.

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

Attachments

- A) Revised Republican River Compact Administration Accounting Procedures and Reporting Requirements
- B) Proposal to move the North Fork Accounting Point

SIGNED BY

Megan A. Sullivan
Engineer Committee Member for Colorado

Scott E. Ross
Engineer Committee Member for Kansas

James Schneider
Engineer Committee Member for Nebraska

Engineering Committee Report

Republican River Compact Administration

August 31, 2011

ASSIGNMENTS

At the August 12, 2010 Annual Meeting of the Republican River Compact Administration, the Commissioners assigned the Engineering Committee the following tasks:

1. Finalize work on a user's manual for the RRCA Accounting Procedures and provide a recommendation to the Administration for adoption at next year's annual meeting or earlier.
2. Exchange by April 15, 2011 the information listed in Section V of the RRCA Accounting Procedures and Reporting Requirements, and other data required by that document. By July 15, 2011 the states will exchange any updates to these data.
3. Continue efforts to resolve concerns related to varying methods of estimating ground and surface water irrigation recharge and return flows within the Republican River Basin and related issues.
4. Retain Principia Mathematica to perform on-going maintenance of the ground water model and periodic updates requested by the Engineering Committee for calendar year 2011. The billable costs shall be limited to actual costs incurred, not to exceed \$15,000 in total and will be apportioned in equal 1/3 amounts to the States of Colorado, Kansas, and Nebraska respectively.
5. Continue development of a five-year accounting spreadsheet/database for adoption at the 2011 annual meeting or earlier.
6. Continue to review Colorado's augmentation proposal, as appropriate.
7. Continue efforts to finalize accounting for 2008 and 2009. By October 15, 2010, the Engineering Committee will meet to discuss issues surrounding model inputs and accounting data. Also, by October 15, 2010 Colorado will provide meter data as required under the FSS.
8. By October 15, 2010, the Engineering Committee will meet to discuss issues preventing agreement on final accounting for 2006-2009.
9. Discuss Water Short Year accounting for Beaver Creek.
10. Discuss and resolve the issue of missing precipitation data.

WORK ACTIVITIES RELATED TO THESE ASSIGNMENTS AND OTHER ISSUES

The Engineering Committee and technical representatives from the States of Colorado, Kansas, and Nebraska participated in several collaborative work activities and phone conferences and the following assignments and work activities were completed:

1. **Complete the user's manual for accounting procedures and provide a resolution for its adoption.**
 - a) The States reviewed the 2006 draft initiated by Kansas and provided comments. However, a final draft of the manual was not completed; the assignment should be continued next year.
2. **Exchange by April 15, 2011 the information listed in Section V of the RRCA Accounting Procedures and Reporting Requirements, and other data required by that document. By July 15, 2011 the states will exchange any updates to these data.**
 - a) Each state exchanged its model data sets by April 15, 2010 or shortly thereafter. A preliminary run of the RRCA groundwater model was developed by Willem Schreuder of Principia Mathematica and posted on the RRCA web site he maintains for the Administration.
 - b) The States exchanged their available final data in August of 2011. Willem Schreuder of Principia Mathematica completed a model run based on this data and posted the results on the RRCA web site.
 - c) Final accounting for 2010 was not completed.
 - d) Data sets were collected by the Committee for stream flow, climate information, diversion records, and reservoir evaporation records of the three states in cooperation with the U.S. Geological Survey, U.S. Bureau of Reclamation, and U.S. Army Corps of Engineers for 2010.
3. **Continue efforts to resolve concerns related to varying methods of estimating ground and surface water irrigation recharge and return flows within the Republican River Basin and related issues.**
 - a) Kansas provided a copy of the *Corn Yield Response to Deficit Irrigation* report by Kansas State University. Both Colorado and Nebraska will review the report. No additional progress has been made on this assignment.
4. **Retain Principia Mathematica to perform on-going maintenance of the ground water model and periodic updates requested by the Engineering Committee.**
 - a) Each state separately contracted with Principia Mathematica.
5. **Continue development of a five-year accounting spreadsheet/database for adoption at the 2010 annual meeting or earlier.**
 - a) The assignment was not completed; the assignment should be continued next year.
6. **Continue to review Colorado's augmentation proposal, as appropriate.**

- a) Proposal was the subject of arbitration. No additional information was discussed by the Engineering Committee.
- 7. **Continue efforts to finalize accounting for 2008 and 2009. By October 15, 2010, the Engineering Committee will meet to discuss issues surrounding model inputs and accounting data. Also, by October 15, 2010 Colorado will provide meter data as required under the FSS.**
 - a) The Engineering Committee discussed this assignment. Unresolved issues subject to non-binding arbitration as well as Kansas' data requests continue to prevent agreement on accounting data. Colorado was unable to provide final meter data. Preliminary data was collected and is under review.
- 8. **By October 15, 2010, the Engineering Committee will meet to discuss issues preventing agreement on final accounting for 2006-2009.**
 - a) The Engineering Committee discussed this assignment. Unresolved issues subject to non-binding arbitration and Kansas' data requests continue to prevent agreement on model results and accounting data.
- 9. **Discuss Water Short Year accounting for Beaver Creek.**
 - a) Topic was raised during arbitration and under discussion outside the Engineering Committee. Topic was not pursued by the Engineering Committee
- 10. **Discuss and resolve the issue of missing precipitation data.**
 - a) A subcommittee of ground water modelers from each state met to resolve the issue. The subcommittee will provide the Engineering Committee with a recommended procedure to fill gaps from missing data.

RECOMMENDED ASSIGNMENTS FOR THE COMING YEAR

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

- 11. Finalize work on a user's manual for the RRCA Accounting Procedures and provide a recommendation to the Administration for adoption at next year's annual meeting or earlier.
- 12. Exchange by April 15, 2012 the information listed in Section V of the RRCA Accounting Procedures and Reporting Requirements, and other data required by that document. By July 15, 2012 the states will exchange any updates to these data.
- 13. 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.
- 14. Retain Principia Mathematica to perform on-going maintenance of the ground water model and periodic updates requested by the Engineering Committee for calendar year 2012. The billable costs shall be limited to actual costs incurred, not to exceed \$15,000 in

total and will be apportioned in equal 1/3 amounts to the States of Colorado, Kansas, and Nebraska respectively.

15. Continue development of a five-year accounting spreadsheet/database for adoption by the RRCA.
16. Continue to review Colorado's augmentation proposal, as appropriate.
17. Continue efforts to finalize accounting for 2008 and 2009.
18. Continue discussion of issues preventing agreement on final accounting for 2006-2009.

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

Attachments

- A) Revised Republican River Compact Administration Accounting Procedures and Reporting Requirements
- B) Proposal to move the North Fork Accounting Point

SIGNED BY

Megan A. Sullivan
Engineer Committee Member for Colorado

Scott E. Ross
Engineer Committee Member for Kansas

James Schneider
Engineer Committee Member for Nebraska

**Summary Report of Preliminary Findings
to the Republican River Compact Administration
on the
Study on the Impacts of Non-Federal Reservoirs and Land Terracing
on Basin Water Supplies
August 26, 2011**

Introductory Information

Kansas, Nebraska and Colorado agreed to and the United States Supreme Court approved the Final Settlement Stipulation to settle the Kansas v. Nebraska and Colorado litigation on the Republican River Compact. The Final Settlement Stipulation required a study to determine the quantitative effects of Non-Federal Reservoirs and land terracing practices on water supplies in the Republican River Basin above Hardy, Nebraska.

A study plan was transmitted to members of the Republican River Compact Administration (RRCA) on April 30, 2004. The study plan was approved by the RRCA during the annual meeting in 2004 and a memorandum of understanding formally approving the study proposal was completed on July 27, 2004. There have been six annual status reports from 2005 through 2010. These annual status reports describe progress on the study during the year and describe study methods and preliminary water balance model results.

This report provides the preliminary findings of the study to determine the quantitative effects of Non-Federal Reservoirs and land terracing practices on water supplies in the Republican River Basin above Hardy, Nebraska (Study). The specific findings of the Study that are summarized are:

1. The quantified effect of the land terraces on the water supply for each of the designated drainage basins and for the full Republican River Basin above Hardy, Nebraska, including the difference in evaporation with and without land terraces, the difference in groundwater recharge with and without land terraces, the difference in ET with and without land terraces, and the total impact on water supply as measured at the gaging station near the bottom of each designated drainage basin;
2. The quantified effect of Non-Federal Reservoirs on the water supply in a similar manner to No. 1 above, and
3. The combined quantified effect of both land terraces and Non-Federal Reservoirs on the water supply in a similar manner to No. 1 above.

Land Terraces and Non-Federal Reservoirs in the Basin

The Study includes an inventory of land terraces and Non-Federal reservoirs in the basin and collected information from field sites on the water balance at both land terrace and reservoir sites. A water balance model was developed using information acquired during the field investigation component of the Study and was used to simulate the impact of the land terraces and reservoirs for various combinations of existing meteorological, soils, and land use data. Finally, post-processing routines were developed to summarize the water balance model results by designated drainage basins or sub-basins. Previous annual status reports provide more detail regarding the land terrace and reservoir inventory, the collection of data on the field water balance, and on the water balance model used to simulate the impacts.

Through a combination of previous work and work done for this Study, 2,161,690 acres of terraced land have been identified in the study area. Previous annual status reports reported slightly more terraced land, but a review of the database indicates the total acres should be revised. An investigation of 167 land terrace systems was conducted to determine the storage capacity of the terraces. The field investigations indicated, among other information, that for a typical terraced field approximately 35 percent of the entire field with terraces was below the ridge of the most downstream terrace. An adjustment of the acres in the mapped terraced field was needed to account for that portion of the field where runoff is not affected by terraces.

Early in the Study, each of the States identified their respective Non-Federal Reservoirs in the basin, a total of 709 reservoirs. These reservoirs have a combined drainage area of 3,753,880 acres. There are 22 of these reservoirs that have large contributing drainage areas where the combined drainage area is 2,745,515 acres. The State's inventory of Non-Federal Reservoirs does not contain all of the data required for each reservoir for the Study to assess the impact of reservoirs on water supply. Information on drainage area, volume, and depth is not available for some reservoirs in the inventory. Therefore, characteristics of a typical reservoir for each State for different locations across the basin were developed using information for reservoirs in the inventory that did have a complete set of descriptive information. The impact on water supply was then simulated using the characteristics of the typical reservoirs. The relative location of the non-federal reservoirs and the terraced area in the Republican River Basin along with other basin information is shown on Figure 1.

Water Balance Modeling at Point Locations or Field Location Scale

The water balance model was used to simulate operation of land terraces and typical reservoirs on a daily basis for 1950-2008, a 59-year period. The water balance model was operated to simulate the water balance for five types of typical terraces and for typical reservoirs for each of the three major soil types identified for the basin at each of the 32 meteorological stations across the basin. These simulations provided output values that could be weighted for a particular location by using values from the three nearest meteorological station and the particular conditions at the location. This was accomplished by using a post-processing procedure.

The weather was defined for each HUC12 by three of the 32 weather stations in or near the basin. The three weather stations were selected based on proximity to the centroid of the HUC12 with stations that align north to south favored over stations that align east to west. For the three selected stations, closer stations to the centroid of the HUC12 were weighted to provide more impact than the more distant stations.

Soils in the basin were grouped into three basic soil types to be included as input to the water balance model. The three soil types are:

1. Deep silt loam with high water holding capacity of 2.25 inches/foot, moderate infiltration, and moderate drainage,
2. Deep silt loam with good water holding capacity of 2.00 inches/foot, moderate infiltration, and moderate drainage, and

3. Deep loamy sand with water holding capacity of 1.25 inches/foot, moderate infiltration, and rapidly permeable subsoil.

It was assumed that the soils had a depth of six feet for the active rooting depth.

The water balance model uses seven land use groups as follows:

1. Dryland corn - continuous cropping,
2. Dryland wheat – continuous cropping,
3. Wheat-corn-fallow rotation -- 3-year rotation,
4. Wheat-fallow rotation -- 2-year rotation,
5. Hay and forage – continuous cropping,
6. Range/Pasture – continuous cropping, and
7. Irrigated Corn – continuous cropping.

There are five types of terraces that were modeled with the water balance model. The water balance for each terrace type needed to be simulated because each terrace type has differing storage capability. The five terrace types are closed-end, level flat channel terraces; closed-end, level broadbase terraces; open-end, level, flat channel terraces; open-end, level, broadbase terraces; and graded broadbase terraces. The water balance simulations for five different terrace types were performed with and without reservoirs for each HUC12.

Water balance model simulations were completed on a daily time-step for the period of study for each combination of weather, soils, and land uses for each meteorological station with no land terraces. This output was further processed through a simulation routine, TERRACE POND, to estimate the amount of outflow from the terrace, infiltration into the terrace channel at various heights across the terrace channel, evaporation from ponded water in the terrace channel, and stored water remaining at the end each day. This produced the amount of reduction in runoff out of the terrace. A second simulation routine, TERRACE CHANNEL, simulated the water balance at each of the various heights in the terrace channel to determine the amount of additional net ET and the additional percolation below the rooting depth in the terrace channel.

These first simulations were completed, too, to determine the operation of the typical reservoir with no terraces in its drainage area to produce input for reservoir without terraces. A second set of simulations added terraces to the drainage area along with a factor that reduced the amount of runoff from the areas above terraces to provide input for reservoirs with terraces.

Table 1 lists the water balance model output for reservoirs for a portion of the Prairie Dog Creek sub-basin. The selected model output is based on data from three weather stations in Kansas, Dresden, Norton, and Oberlin1E, and for the three soil types. The output shows the simulated water balance with and without reservoirs.

Table 1. -- Selected Water Balance Model Output for a portion of Prairie Dog Creek Sub-basin for Reservoirs with no Terraces and for Reservoirs with Terraces.

Results are for ac-ft/sq-mile of drainage area unless otherwise noted.												
Weather Station	SO = Soil type		inches/yr		RESERVOIRS NO TERRACES				RESERVOIRS WITH TERRACES			
	STSTNID	SO	Precip.	RefETo	Inflow	Outflow	Percolat.	Net ET	Inflow	Outflow	Percolat.	Net ET
Dresden, KS	142213	5	21.65	50.15	42.20	9.36	25.72	7.12	37.41	7.52	23.34	6.55
	142213	7	21.65	50.15	40.17	8.69	24.63	6.85	35.61	6.93	22.37	6.30
	142213	11	21.65	50.15	31.76	6.36	19.86	5.55	28.15	5.29	17.81	5.04
Norton, KS	145856	5	22.36	48.90	49.66	11.98	29.79	7.89	45.13	10.05	27.69	7.39
	145856	7	22.36	48.90	47.11	11.02	28.51	7.58	42.80	9.26	26.45	7.10
	145856	11	22.36	48.90	36.47	7.97	22.40	6.10	33.15	6.67	20.78	5.70
Oberlin 1E, KS	145906	5	21.25	50.66	42.24	9.01	25.92	7.30	38.27	7.61	23.86	6.81
	145906	7	21.25	50.66	40.00	8.20	24.79	7.01	36.23	6.93	22.77	6.52
	145906	11	21.25	50.66	30.27	6.04	18.82	5.41	27.48	5.22	17.24	5.02

Table 1 shows that inflow, outflow, percolation, and net ET are less with terraces above reservoir than with no terraces above reservoirs, as expected. The values in Table 1 are average values for the 59-year simulation period.

Table 2 lists some of the water balance model output for land terraces for a portion of the Prairie Dog Creek sub-basin. The selected model output is based on data from three weather stations in Kansas, Dresden, Norton, and Oberlin 1E, and for the three soil types. The output shows the simulated water balance for the land uses of continuous dryland corn, continuous dryland wheat, and for a wheat-corn-fallow rotation. The other four land uses were simulated, but are not shown in this table.

For the no terraces simulated condition, the values of runoff and percolation are of most interest. The runoff is the amount that would leave the field edge and the percolation is the amount that results without any water ponding in the field. Of course, most the water added is lost by evapotranspiration.

With closed-end, level, flat channel terraces in the field the parts of the field above the lowest terrace ridge the runoff in the field flows into the terrace channel and the channel must be filled to overflowing before any runoff leaves the field as overflow. Since the effects of the terraces is the focus of this study, the effects from the terrace are reported as the change in the amount of ET, runoff, and percolation. ET is increased because there is more soil water available in the terrace channel. Runoff is reduced because most of the runoff water is retained in this storage-type terrace and subsequently infiltrates into the soil. During some periods the amount of infiltration is more than the soil can store for subsequent plant use so part of it percolates beyond where plants can utilize it. This type of terrace is the most effective at reducing the amount of runoff from areas above terraces. In general, across the basin they reduce runoff from the area above them by about 85-90%.

Table 2. -- Selected Water Balance Model Output for a portion of Prairie Dog Creek Sub-basin.

					With No Terraces								
					All values are in ac-ft/sq mile of land								
Weather Station	SO = Soil type		inches/yr		Continuous Dryland Corn			Continuous Dryland Wheat			Wheat-Corn-Fallow		
	STSTNID	SO	Precip.	RefETo	ET	Runoff	Percolat.	ET	Runoff	Percolat.	ET	Runoff	Percolat.
Dresden, KS	142213	5	21.65	50.15	1096.43	59.46	1.84	1095.94	46.81	12.67	1058.63	58.88	37.58
	142213	7	21.65	50.15	1095.40	56.72	4.13	1087.83	44.28	22.16	1031.48	56.74	65.84
	142213	11	21.65	50.15	1076.99	44.90	32.23	1058.64	34.05	60.50	957.72	41.87	153.89
Norton, KS	145856	5	22.36	48.90	1126.77	62.85	4.32	1119.99	55.09	15.99	1069.86	64.82	57.03
	145856	7	22.36	48.90	1122.51	59.34	10.72	1109.36	52.54	29.01	1039.05	62.33	89.44
	145856	11	22.36	48.90	1091.68	46.14	53.36	1071.69	40.47	79.14	963.09	45.61	182.53
Oberlin 1E, KS	145906	5	21.25	50.66	1079.90	57.61	0.28	1082.38	45.67	7.30	1044.88	57.29	32.94
	145906	7	21.25	50.66	1078.75	54.89	2.72	1075.73	43.42	15.26	1019.24	55.28	59.58
	145906	11	21.25	50.66	1057.39	40.81	36.12	1046.35	32.72	54.33	949.71	39.36	144.05
Values for ET, Runoff, and Percolation for terraces represent changes from those same values for no terraces in the top half of this table					Closed-End, Level, Flat Channel Terraces								
					All values are in ac-ft/sq mile of land								
					Continuous Dryland Corn			Continuous Dryland Wheat			Wheat-Corn-Fallow		
					ET	Runoff	Percolat.	ET	Runoff	Percolat.	ET	Runoff	Percolat.
Dresden, KS	142213	5	21.65	50.15	27.86	-51.51	23.64	19.49	-43.19	23.70	15.99	-52.03	36.04
	142213	7	21.65	50.15	23.97	-49.39	25.42	16.88	-41.01	24.14	13.53	-50.37	36.84
	142213	11	21.65	50.15	11.36	-39.82	28.46	8.73	-31.77	23.05	6.98	-37.73	30.75
Norton, KS	145856	5	22.36	48.90	25.83	-55.23	29.40	18.42	-49.41	30.99	13.73	-57.45	43.73
	145856	7	22.36	48.90	21.76	-52.53	30.78	15.86	-47.07	31.22	11.73	-55.48	43.75
	145856	11	22.36	48.90	10.25	-42.49	32.24	7.53	-36.80	29.28	6.34	-41.46	35.12
Oberlin 1E, KS	145906	5	21.25	50.66	27.40	-51.18	23.79	18.18	-41.99	23.81	15.56	-51.17	35.60
	145906	7	21.25	50.66	22.95	-48.95	26.00	15.71	-39.78	24.07	13.02	-49.37	36.35
	145906	11	21.25	50.66	9.29	-35.91	26.62	7.55	-29.59	22.04	6.16	-34.98	28.82

The runoff reduction is at the edge of the terraced field or dam site and not at the mouth of a designated drainage basin. A stream transmission loss needs to be applied to the runoff reduction to estimate the impact of the terraces on the water supply for each of the designated drainage basins and for the full Republican River Basin above Hardy, Nebraska.

Processing Water Balance Model Simulations to Basin Scale

The water balance model results for the various conditions were accumulated by the post-processing procedure for each geographic area defined by a 12-digit hydrologic unit code, hereafter referred to as HUC12(s), (HydroUnit 12 Watershed Boundary Dataset). There are 557 HUC12s in the study area. Input data for each HUC12 included: total area, drainage area of reservoirs, area of terraced land, percent of three soil types, percent of seven land uses in the terraced areas, percent of five types of terraces, three nearest meteorological stations and the relative weight for each one, the travel distance from the centroid to the sub-basin outlet, and the estimated transmission loss factor from the HUC12 to its sub-basin outlet. Results were accumulated to provide an estimate of the additional Net ET and additional recharge from the reservoirs and terraces within the HUC12 and the resulting reductions in surface runoff at the sub-basin outlet and in the amount of transmission losses from the HUC12 to the outlet caused by less surface runoff leaving the reservoirs and terraces.

Of the 557 HUC12s in the basin, 92 HUC12s do not have a surface water connection with downstream streams according to the National Hydrologic Dataset, see Figure 1.

The effects of the conservation practices at the point or field location were moved to the water outlet of each HUC12 by applying a stream transmission loss factor. The stream transmission loss factor is based upon the streamflow length that the water must travel to get to the water outlet of the HUC12 and a transmission loss in percent per mile. For purposes of this study, the streamflow length was assumed to be the distance from the centroid of the HUC12 to the water outlet of the HUC12. Additionally, the effect at the water outlet of each HUC12 was transferred to the outlet of the designated drainage basin within which it is located. If a federal reservoir is located within a designated drainage basin, the effects for each HUC12 were accumulated at the federal reservoir for HUC12s upstream of the federal reservoir and at the outlet of the designated drainage basin for those HUC12s with outlets between the federal reservoir and the outlet of the designated drainage basin.

For HUC12s along the North Fork of the Republican River in Nebraska and the main stem between the junction of North Fork and Arikaree and near Hardy, Nebraska where the river dissects a HUC12, it was split into two geographic areas, one on each side of the river, and the streamflow length was computed for each of the geographic areas and averaged to arrive at the streamflow length for those HUC12s. Additionally, for these HUC12s the effects were only transferred to the mainstem of the respective stream and were not transferred further downstream along the river. There is a transmission loss along the mainstem, but there are also many other unknown factors that affect the water balance along these stream reaches, and determining these factors was beyond the scope of this study.

A transmission loss of an average of about 2 percent per mile was applied to transfer the impact at the land terrace or reservoir location to downstream locations. We did increase it to

2.5 percent per mile for about the western half of the basin and decreased it to 1.5 percent per mile for the area below Harlan County Reservoir. The decision on what the transmission loss factor to use was based on professional judgement. Information on transmission loss was presented in previous status reports to the RRCA and is not repeated in this report.

Summary of Findings

The quantified effect of Terraces Only, Non-Federal Reservoirs Only without Terraces, the combined effect of land terraces and Non-Federal Reservoirs on the Republican River Basin water supplies is listed in Table 3.

The three conditions for results in Table 3 represent those requested in the Study. Reservoirs Only without Terraces are results with our best estimates of conditions in the drainage areas of the reservoirs identified for the Study in the basin. The reservoirs intercept the surface runoff and the runoff either overflows the reservoir or is retained. Retained runoff is subsequently lost as evaporation and some additional evapotranspiration from the storage area of the reservoir or seeps out and become recharge under the reservoir. Since the water that is retained does not flow on downstream, the reduction in water flow in the stream results in a reduction in streamflow at the outlet of the sub-basin and in a reduction in the amount of water that would have moved out the stream along the flow path to the outlet of the sub-basin as a transmission loss. In all cases the increase in Net ET plus Recharge equals the decrease in Surface Runoff plus decrease in Transmission Loss.

For the Terraces Only results the same effects as for Reservoirs Only without Terraces occur. In the case of the terraces, however, more of the retained water is lost as NetET because water is ponded less deeply and the terrace channel generally supports terrestrial plants that extract more stored water from the soil.

For the Terraces plus Reservoirs Combined condition, terraces have their full effect that is shown in the Terraces Only without Terraces results. The net effect of reservoirs are reduced somewhat by terraces in their drainage areas. Less runoff flows into the reservoirs and subsequently results in less NetET and Recharge from the reservoir and the losses downstream of the reservoirs are decreased, too.

Land terracing and Non-Federal Reservoirs are having a substantial effect on the water resources of the Republican River Basin above Hardy, Nebraska. With both terraces and Non-Federal Reservoirs operating in the basin, net evapotranspiration is increased by an average of about 36,000 acre-feet annually, recharge is increased about 89,000 acre-feet, surface runoff is decreased by about 64,000 acre-feet, and transmission loss is decreased by about 62,000 acre-feet as compared to conditions in the basin with no terraces and no Non-Federal Reservoirs, Table 3.

The total area in the Basin is 22,940 square miles. The total area identified in terraced fields in the basin is about 3,350 square miles and about 65% of this total area or 2,180 square miles are above the lowest terrace in the field. Across the basin, land terracing reduces runoff from the areas above terraces by about an average of 32 acre-feet/year per square mile for an average total of about 71,000 acre-feet/year in the fields. About 33 percent of the retained runoff is lost by

additional evapotranspiration processes in the runoff storage and infiltration area in the terrace channels, 24,000 acre-feet/year, and the remainder is recharge beneath the terrace channels.

The total area identified in the drainage area of more than 700 small, Non-Federal Reservoirs is 5,870 square miles. Of this area, the “effective drainage area” for this study is about 1,750 square miles. A number of these reservoirs are in the western portion of the basin where the soils and drainage network make surface runoff production and transmission very low. The estimated effect of reservoirs only reduce runoff losses by about an average 33 (Jim, you had 32??) acre-feet/year per square mile of effective drainage area for an average total of about 58,000 acre-feet/year at the reservoirs. About 20 percent of the retained runoff is lost by evaporative processes (12,000 acre-feet/year) and the remainder is recharge out of the reservoirs.

Because some of the terraced land is in the drainage areas of the reservoirs, combining the two factors and accounting for the overlap of the two, the average total reduction of runoff is about 125,000 acre-feet/year, about 4,000 acre-feet/year less than from the sum of the two alone. The downstream impacts of the reduction in runoff from the terraces and reservoirs result in less streamflow and reduced losses from the stream from less transmission losses along the stream. This sum of these two reductions equals the amount of runoff that is retained by the reservoirs and terraces. Losses of water from the stream from locations of the reservoirs and the terraced fields decrease the amount of runoff that reaches the outlet of the various sub-basins, or designated drainage basin, in the basin. In the basin, the average transmission loss is estimated to be about two percent of the amount of flow in the stream per mile of flow along the stream. This high loss and the long stream lengths in the sub-basins result in about half of the losses are attributed to reduction in streamflow and half attributed to less transmission losses along the stream.

The additional recharge under the reservoirs and the terraced fields may eventually produce additions to surface streamflow or to groundwater for use in the basin. The locations for recharge are further upstream than without the terraces and reservoirs in the basin and on areas where recharge rates are much lower with these conservation practices in place.

Only the additional water lost by evaporation from the reservoirs and additional ET from the terraces channels is a direct loss from the hydrologic cycle in the basin. The additional recharge may still be available depending on many other factors and on the time scale for the accounting used.

~~Small reservoirs and land terracing are important practices for this basin. Reservoirs store water and provide some potential for a small part of the water use, aid in flood control and grade stabilization in eroding channels and provide some water-based recreation and wildlife habitat. Terracing reduces soil erosion by water on cropland on sloping lands and increase the available water supply for dryland crops in much of the basin. In addition they provide improved water management close to where the precipitation that results in the runoff that they utilize near where it occurs.~~

~~The most apropos summary of this situation is best summed up by Robert Green Ingersoll, “In nature there are neither rewards nor punishments; there are consequences.”~~

Uncertainty of Transmission Loss Assumptions

Transmission losses are estimated to be larger in the western portions of the basin and lowest in the eastern portion of the basin. Periods with wetter conditions likely have lower losses than during dry periods, but there is not enough known about transmission loss to make better assumption on how and went to apply different loss factors. The range of uncertainty for this factor can make estimates of effects on streamflow in the order of 25%. To examine the sensitivity of the transmission loss factor, three sets of values were used across the basin as shown in Table 4. The Base is our best estimate, the Higher is a one percent increase for all HUC12s and the Lower is a one percent decrease for all HUC12s.

Table 4. -- Effect of Transmission Loss Factor on the Division of the Decrease in Runoff Water in the Entire Basin.

		Values are average acre-feet/year		
Transmission Loss, %/mile		Decreased	Decreased	
		Streamflow	Transmission Losses	Sum
3.5 to 2.5	Higher	-55,000	-70,000	-125,000
2.5 to 1.5	Base	-64,000	-62,000	-126,000
1.5 to 0.5	Lower	-82,000	-43,000	-125,000

Note: All values are rounded to the nearest 1,000 acre-feet/year.

Our best estimate is that the transmission loss effect divides the total reduction caused by terraces and reservoir reservoirs about equally into decreased streamflow and decreased transmission losses. The Higher values result in a lower decrease in streamflow by about fifteen percent while the Lower values increase the amount of streamflow reduction by about thirty percent compared to the Base. Clearly, the transmission loss factor is an important component for streamflow reduction.

Figure 1. – Map of the Study Area showing the location of the Terraced Land, Non-Federal Reservoirs, Federal Reservoirs, Designated Drainage Basins, and Hydrologic Units used for Water Balance Modeling.

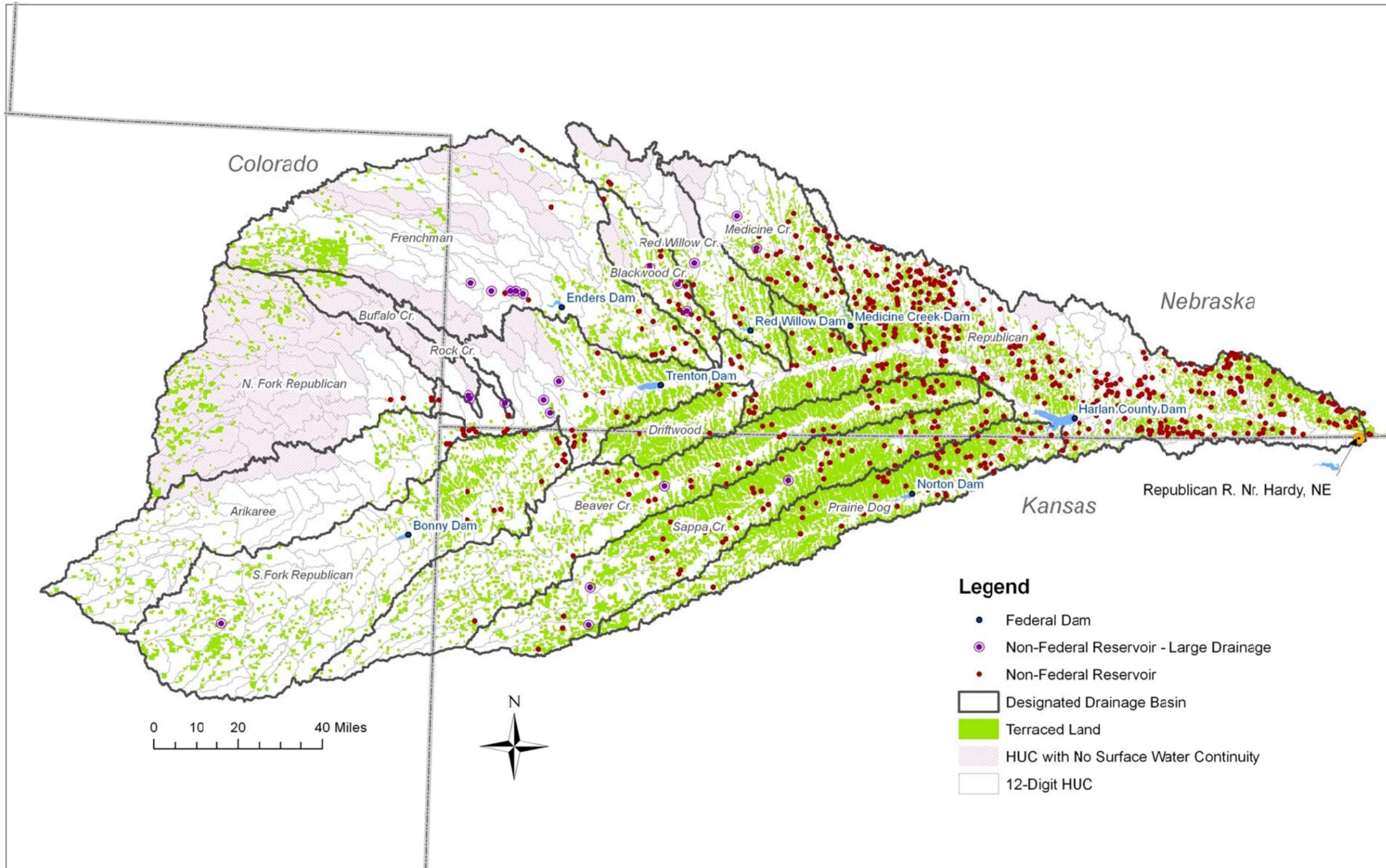


Table 3. – Quantitative Effect of Terraces only, Reservoirs only without Terraces, and Terraces plus Reservoirs Combined on the Republican River Basin Water Supplies.

Output in average acre-feet per year for the 59-year period, 1950-2008.	Terraces ONLY				Reservoirs ONLY				Terraces and Reservoirs COMBINED				Reservoirs With Terraces in Drainage Area			
	<p>Net ET is the increase in the terrace channels Recharge is the increase under the terrace channels Surface Runoff reduction = Runoff reduction at the field edge out of terraces times the Transmission loss percentage based on the distance to sub-basin outlet and the percent/mile loss rate Transmission Loss reduction = Runoff reduction at the field edge out of the terrace channels minus the surface runoff reduction</p>				<p>Net ET is the increase in net surface evaporation plus increase in ET from periodically inundated areas within the reservoir storage area Recharge is the net seepage out of the reservoir Surface Runoff reduction is the difference between inflow to the reservoir and outflow from the reservoir times the Transmission loss factor based on the distance to the sub-basin outlet and the percent/mile loss rate Transmission Loss reduction = The difference between inflow to the reservoir and outflow from the reservoir minus the surface runoff reduction</p>				<p>Net ET is the sum of Reservoirs With Terraces plus the Net ET for Terraces ONLY Recharge is the sum of the Recharge for Reservoirs With Terraces plus the Recharge for Terraces ONLY Surface Runoff reduction is the sum for Reservoirs With Terraces plus the surface runoff reduction for Terraces ONLY</p>				<p>Effects are the same as for Reservoirs ONLY except the terraces in the drainage area reduce inflow to the reservoir and results in lower amounts of Net ET, Recharge, Surface Runoff reduction, and Transmission Loss reduction for the reservoirs</p>			
	<p>For ALL Scenarios: Net ET + Recharge = Field or drainage area runoff that does not flow beyond the terrace or reservoir. Downstream this reduction in runoff equals to less surface runoff from the stream plus less Transmission Losses from the stream.</p>				<p>The effects of transmission losses and recharge on total streamflow and ground-water in each sub-basin is unknown and is beyond the scope of this project.</p>				<p>Some terraces are in the reservoir drainage areas</p>				<p>Some terraces are in the reservoir drainage areas</p>			
NOTE: In all tables, Surface Runoff and Transmission Losses are shown as negatives to indicate they are reduced.																
	SCENARIO #1				SCENARIO #2				SCENARIO #3				RESERVOIRS ONLY WITH TERRACES			
	TERRACES ONLY				RESERVOIRS ONLY WITHOUT TERRACES				TERRACES PLUS RESERVOIRS COMBINED				RESERVOIRS ONLY WITH TERRACES			
DESIGNATED DRAINAGE BASIN	NET ET	SURF. RUNOFF	RECHARGE	TRANS. LOSS	NET ET	SURF. RUNOFF	RECHARGE	TRANS. LOSS	NET ET	SURF. RUNOFF	RECHARGE	TRANS. LOSS	NET ET	SURF. RUNOFF	RECHARGE	TRANS. LOSS
Arikaree	349	-195	364	-518	7	-24	20	-4	355	-213	380	-521	6	-19	16	-3
NFRepublican - Abv CO-NE Stateline	483	-148	368	-704	46	-106	130	-70	530	-253	497	-774	46	-106	130	-70
Republican River (see note)	5,207	-14,585	12,537	-3,159	5,785	-23,167	22,551	-5,169	10,585	-35,963	33,301	-7,924	5,378	-21,377	20,764	-4,765
Buffalo Cr	99	-41	125	-183	0	0	0	0	99	-41	125	-183	0	0	0	0
Rock Cr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SFRepublican - Abv Bonny Dam	558	-265	521	-815	177	-97	508	-588	720	-352	979	-1,347	162	-87	458	-532
SFRepublican - Blw Dam to Mouth	894	-931	1,313	-1,275	140	-375	459	-224	1,031	-1,302	1,763	-1,492	137	-370	450	-217
Blackwood Cr	312	-523	804	-592	768	-1,656	2,844	-1,956	1,008	-2,012	3,343	-2,339	697	-1,489	2,539	-1,747
Driftwood Cr	1,165	-1,337	2,303	-2,131	65	-170	234	-130	1,226	-1,494	2,519	-2,250	61	-157	215	-119
Frenchman - Abv Enders Dam	680	-163	694	-1,212	120	-276	371	-215	784	-402	1,008	-1,391	104	-239	314	-179
Frenchman - Blw Dam to Mouth	628	-816	1,151	-963	271	-692	933	-512	882	-1,462	2,015	-1,434	254	-646	863	-471
Red Willow Cr - Abv Red Willow Dam	326	-677	746	-396	397	-1,027	1,454	-824	693	-1,613	2,063	-1,143	367	-936	1,317	-747
Red Willow Cr - Blw Dam to Mouth	189	-527	528	-190	18	-67	68	-19	205	-586	587	-206	16	-59	59	-16
Medicine Cr - Abv Medicine Cr Dam	657	-1,008	1,444	-1,093	1,897	-3,160	6,796	-5,533	2,759	-4,196	8,101	-6,663	2,101	-3,188	6,657	-5,570
Medicine Cr - Blw Dam to Mouth	136	-308	247	-75	31	-112	109	-27	171	-424	356	-103	36	-116	109	-28
Sappa Cr	5,036	-2,304	9,147	-11,879	1,241	-701	4,397	-4,938	6,192	-2,950	13,197	-16,439	1,157	-647	4,050	-4,560
Beaver Crk	3,757	-2,418	7,004	-8,343	670	-823	2,308	-2,155	4,384	-3,180	9,136	-10,340	627	-763	2,132	-1,997
Prairie Dog - Abv Norton Dam	2,465	-3,704	4,868	-3,629	310	-926	1,138	-523	2,753	-4,556	5,910	-4,107	287	-852	1,042	-478
Prairie Dog - Blw Dam to Mouth	1,157	-1,818	2,764	-2,102	407	-1,024	1,525	-909	1,536	-2,762	4,170	-2,945	380	-944	1,406	-843
Republican River Abv Hardy, NE	24,098	-31,767	46,928	-39,259	12,350	-34,400	45,844	-23,795	35,912	-63,761	89,447	-61,600	11,815	-31,994	42,520	-22,340

Note: For the Republican River mainstem, transmission loss was calculated for each HUC12 from the centroid of the HUC12 to its junction with the mainstem. Transmission loss was not calculated from the junction with the mainstem to Hardy, NE.

Table 3A: Colorado's Five-Year Average Allocation and CBCU

Year	Allocation	Computed Beneficial Consumptive Use	Imported Water Supply Credit	Allocation - (CBCU - IWS Credit)
2006	21,260	31,280	NA	(10,020)
2007	24,520	32,850	NA	(8,330)
2008	25,420	30,530	NA	(5,110)
2009	33,390	39,780	NA	(6,390)
2010	28,580	32,090	NA	(3,510)
Average	26,630	33,310	NA	(6,670)

Table 3B: Kansas's Five-Year Average Allocation and CBCU

Year	Allocation	Computed Beneficial Consumptive Use	Imported Water Supply Credit	Allocation - (CBCU - IWS Credit)
2006	124,830	55,630	NA	69,200
2007	169,700	63,250	NA	106,450
2008	244,500	48,030	NA	196,470
2009	206,820	55,490	NA	151,330
2010	300,020	50,050	NA	249,970
Average	209,170	54,490	NA	154,680

Table 3C: Nebraska's Five-Year Average Allocation and CBCU

Year	Allocation	Computed Beneficial Consumptive Use	Imported Water Supply Credit	Allocation - (CBCU - IWS Credit)
2006	187,090	228,420	12,214	(29,116)
2007	243,560	234,650	21,933	30,843
2008	309,200	249,960	25,758	84,998
2009	272,080	284,240	22,426	10,266
2010	357,920	266,690	24,913	116,143
Average	273,970	252,790	21,450	42,630

Bureau of Reclamation Report has not yet been provided at the time of this printing.

We will update it as soon as we receive it.

1-106 REPUBLICAN RIVER COMPACT

AN ACT to ratify the compact entered into by the states of Colorado, Kansas and Nebraska on December 31, 1942, relating to the Republican River; to repeal Chapter 92, Session Laws of Nebraska, 1941; and to declare an emergency.

Be it enacted by the people of the State of Nebraska,

Section 1. The compact entered into on December 31, 1942, between the states of Colorado, Kansas and Nebraska, and in the formulation of which compact a representative of the President of the United States participated, respecting the waters of the Republican River, is ratified and approved in all respects and is as follows:

REPUBLICAN RIVER COMPACT

The States of Colorado, Kansas, and Nebraska, parties signatory to this compact (hereinafter referred to as Colorado, Kansas, and Nebraska, respectively, or individually as a State, or collectively as the States), having resolved to conclude a compact with respect to the waters of the Republican

River Basin, and being duly authorized therefor by the Act of the Congress of the United States of America, approved August 4, 1942, (Public No. 696, 77th Congress, Chapter 545, 2nd Session) and pursuant to Acts of their respective Legislatures have, through their respective Governors, appointed as their Commissioners:

M.C. Hinderlider, for Colorado

George S. Knapp, for Kansas

Wardner G. Scott, for Nebraska

who, after negotiations participated in by Glenn L. Parker, appointed by the President as the Representative of the United States of America, have agreed upon the following articles:

ARTICLE I

The major purposes of this compact are to provide for the most efficient use of the waters of the Republican River Basin (hereinafter referred to as the "Basin") for multiple purposes; to provide for an equitable division of such waters; to remove all causes, present and future, which might lead to controversies; to promote interstate comity; to recognize that the most efficient utilization of the waters within the Basin is for beneficial consumptive use; and to promote joint action by the States and the United States in the efficient use of water and the control of destructive floods.

The physical and other conditions peculiar to the Basin constitute the basis for this compact, and none of the States hereby, nor the Congress of the United States by its consent, concedes that this compact establishes any general principle or precedent with respect to any other interstate stream.

ARTICLE II

The Basin is all the area in Colorado, Kansas, and Nebraska, which is naturally drained by the Republican River, and its tributaries, to its junction with the Smoky Hill River in Kansas. The main stem of the Republican River extends from the junction near Haigler, Nebraska, of its North Fork and the Arikaree River, to its junction with Smoky Hill River near Junction City, Kansas. Frenchman Creek (River) in Nebraska is a continuation of Frenchman Creek (River) in Colorado. Red Willow Creek in Colorado is not identical with the stream having the same name in Nebraska. A map of the Basin approved by the Commissioners is attached and made a part hereof.

The term "Acre-foot," as herein used, is the quantity of water required to cover an acre to the depth of one foot and is equivalent to forty-three thousand, five hundred sixty (43,560) cubic feet.

The term "Virgin Water Supply," as herein used, is defined to be the water supply within the Basin undepleted by the activities of man.

The term "Beneficial Consumptive Use" is herein defined to be 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.

Beneficial consumptive use is the basis and principle upon which the allocations of water hereinafter made are predicated.

ARTICLE III

The specific allocations in acre-feet hereinafter made to each State are derived from the computed average annual virgin water supply originating in the following designated drainage basins, or parts thereof, in the amounts shown:

North Fork of the Republican River drainage basin in Colorado, 44,700 acre-feet;

Arikaree River drainage basin, 19,610 acre-feet;

Buffalo Creek drainage basin, 7,890 acre-feet;

Rock Creek drainage basin, 11,000 acre-feet;

South Fork of the Republican River drainage basin, 57,200 acre-feet;

Frenchman Creek (River) drainage basin in Nebraska, 98,500 acre-feet;

Blackwood Creek drainage basin, 6,800 acre-feet;

Driftwood Creek drainage basin, 7,300 acre-feet;

Red Willow Creek drainage basin in Nebraska, 21,900 acre-feet;

Medicine Creek drainage basin, 50,800 acre-feet;

Beaver Creek drainage basin, 16,500 acre-feet;

Sappa Creek drainage basin, 21,400 acre-feet;

Prairie Dog Creek drainage basin, 27,600 acre-feet;

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, 87,700 acre-feet.

Should the future computed virgin water supply of any source vary more than ten (10) per cent from the virgin water supply as hereinabove set forth, the allocations hereinafter made from such source shall be increased or decreased in the relative proportions that the future computed virgin water supply of such source bears to the computed virgin water supply used herein.

ARTICLE IV

There is hereby allocated for beneficial consumptive use in Colorado, annually, a total of fifty-four thousand, one hundred (54,100) acre-feet of water. This total is to be derived from the sources and in the amounts hereinafter specified and is subject to such quantities being physically available from those sources:

North Fork of the Republican River drainage basin, 10,000 acre-feet;

Arikaree River drainage basin, 15,400 acre-feet;
South Fork of the Republican River drainage basin, 25,400 acre-feet;
Beaver Creek drainage basin, 3,300 acre-feet; and

In addition, for beneficial consumptive use in Colorado, annually, the entire water supply of the Frenchman Creek (River) drainage basin in Colorado and of the Red Willow Creek drainage basin in Colorado.

There is hereby allocated for beneficial consumptive use in Kansas, annually, a total of one hundred ninety thousand, three hundred (190,300) acre-feet of water. This total is to be derived from the sources and in the amounts hereinafter specified and is subject to such quantities being physically available from those sources:

Arikaree River drainage basin, 1,000 acre-feet;
South Fork of the Republican River drainage basin, 23,000 acre-feet;
Driftwood Creek drainage basin, 500 acre-feet;
Beaver Creek drainage basin, 6,400 acre-feet;
Sappa Creek drainage basin, 8,800 acre-feet;
Prairie Dog Creek drainage basin, 12,600 acre-feet;

From the main stem of the Republican River upstream from the lowest crossing of the river at the Nebraska-Kansas state line and from water supplies of upstream basins otherwise unallocated herein, 138,000 acre-feet; provided, that Kansas shall have the right to divert all or any portion thereof at or near Guide Rock, Nebraska; and

In addition there is hereby allocated for beneficial consumptive use in Kansas, annually, the entire water supply originating in the Basin downstream from the lowest crossing of the river at the Nebraska-Kansas state line.

There is hereby allocated for beneficial consumptive use in Nebraska, annually, a total of two hundred thirty-four thousand, five hundred (234,500) acre-feet of water. This total is to be derived from the sources and in the amounts hereinafter specified and is subject to such quantities being physically available from those sources:

North Fork of the Republican River drainage basin in Colorado, 11,000 acre-feet;
Frenchman Creek (River) drainage basin in Nebraska, 52,800 acre-feet;
Rock Creek drainage basin, 4,400 acre-feet;
Arikaree River drainage basin, 3,300 acre-feet;
Buffalo Creek drainage basin, 2,600 acre-feet;
South Fork of the Republican River drainage basin, 800 acre-feet;
Driftwood Creek drainage basin, 1,200 acre-feet;
Red Willow Creek drainage basin in Nebraska, 4,200 acre-feet;
Medicine Creek drainage basin, 4,600 acre-feet;
Beaver Creek drainage basin, 6,700 acre-feet;

Sappa Creek drainage basin, 8,800 acre-feet;
Prairie Dog Creek drainage basin, 2,100 acre-feet;

From the North Fork of the Republican River in Nebraska, the main stem of the Republican River between the junction of the North Fork and Arikaree River and the lowest crossing of the river at the Nebraska-Kansas state line, from the small tributaries thereof, and from water supplies of upstream basins otherwise unallocated herein, 132,000 acre-feet.

The use of the waters hereinabove allocated shall be subject to the laws of the State, for use in which the allocations are made.

ARTICLE V

The judgment and all provisions thereof in the case of Adelbert A. Weiland, as State Engineer of Colorado, et al. v. The Pioneer Irrigation Company, decided June 5, 1922, and reported in 259 U.S. 498, affecting the Pioneer Irrigation ditch or canal, are hereby recognized as binding upon the States; and Colorado, through its duly authorized officials, shall have the perpetual and exclusive right to control and regulate diversions of water at all times by said canal in conformity with said judgment.

The water heretofore adjudicated to said Pioneer Canal by the District Court of Colorado, in the amount of fifty (50) cubic feet per second of time is included in and is a part of the total amounts of water hereinbefore allocated for beneficial consumptive use in Colorado and Nebraska.

ARTICLE VI

The right of any person, entity, or lower State to construct, or participate in the future construction and use of any storage reservoir or diversion works in an upper State for the purpose of regulating water herein allocated for beneficial consumptive use in such lower State, shall never be denied by an upper State; provided, that such right is subject to the rights of the upper State.

ARTICLE VII

Any person, entity, or lower State shall have the right to acquire necessary property rights in an upper State by purchase, or through the exercise of the power of eminent domain, for the construction, operation and maintenance of storage reservoirs, and of appurtenant works, canals and conduits, required for the enjoyment of the privileges granted by Article VI; provided, however, that the grantees of such rights shall pay to the political subdivisions of the State in which such works are located, each and every year during which such rights are enjoyed for such purposes, a sum of money equivalent to the average annual amount of taxes assessed against the lands

and improvements during the ten years preceding the use of such lands, in reimbursement for the loss of taxes to said political subdivisions of the State.

ARTICLE VIII

Should any facility be constructed in an upper State under the provisions of Article VI, such construction and the operation of such facility shall be subject to the laws of such upper State.

Any repairs to or replacements of such facility shall also be made in accordance with the laws of such upper State.

ARTICLE IX

It shall be the duty of the three States to administer this compact through the official in each State who is now or may hereafter be charged with the duty of administering the public water supplies, and to collect and correlate through such officials the data necessary for the proper administration of the provisions of this compact. Such officials may, by unanimous action, adopt rules and regulations consistent with the provisions of this compact.

The United States Geological Survey, or whatever federal agency may succeed to the functions and duties of that agency, in so far as this compact is concerned, shall collaborate with the officials of the States charged with the administration of this compact in the execution of the duty of such officials in the collection, correlation, and publication of water facts necessary for the proper administration of this compact.

ARTICLE X

Nothing in this compact shall be deemed:

- (a) To impair or affect any rights, powers or jurisdiction of the United States, or those acting by or under its authority, in, over, and to the waters of the Basin; nor to impair or affect the capacity of the United States, or those acting by or under its authority, to acquire rights in and to the use of waters of the Basin;
- (b) To subject any property of the United States, its agencies or instrumentalities, to taxation by any State, or subdivision thereof, nor to create an obligation on the part of the United States, its agencies or instrumentalities, by reason of the acquisition, construction, or operation of any property or works of whatsoever kind, to make any payments to any State or political subdivision thereof, state agency, municipality, or entity whatsoever in reimbursement for the loss of taxes;
- (c) To subject any property of the United States, its agencies or instrumentalities, to the laws of any State to any extent other than the extent these laws would apply without regard to this compact.

ARTICLE XI

This compact shall become operative when ratified by the Legislature of each of the States, and when consented to by the Congress of the United States by legislation providing, among other things, that:

- (a) Any beneficial consumptive uses by the United States, or those acting by or under its authority, within a State, of the waters allocated by this compact, shall be made within the allocations hereinabove made for use in that State and shall be taken into account in determining the extent of use within that State.
- (b) The United States, or those acting by or under its authority, in the exercise of rights or powers arising from whatever jurisdiction the United States has in, over, and to the waters of the Basin shall recognize, to the extent consistent with the best utilization of the waters for multiple purposes, that beneficial consumptive use of the waters within the Basin is of paramount importance to the development of the Basin; and no exercise of such power or right thereby that would interfere with the full beneficial consumptive use of the waters within the Basin shall be made except upon a determination, giving due consideration to the objectives of this compact and after consultation with all interested federal agencies and the state officials charged with the administration of this compact, that such exercise is in the interest of the best utilization of such waters for multiple purposes.
- (c) The United States, or those acting by or under its authority, will recognize any established use, for domestic and irrigation purposes, of the waters allocated by this compact which may be impaired by the exercise of federal jurisdiction in, over, and to such waters; provided, that such use is being exercised beneficially, is valid under the laws of the appropriate State and in conformity with this compact at the time of the impairment thereof, and was validly initiated under state law prior to the initiation or authorization of the federal program or project which causes such impairment.

IN WITNESS WHEREOF, the Commissioners have signed this compact in quadruplicate original, one of which shall be deposited in the archives of the Department of State of the United States of America and shall be deemed the authoritative original, and of which a duly certified copy shall be forwarded to the Governor of each of the States.

Done in the City of Lincoln, in the State of Nebraska, on the 31st day of December, in the year of our Lord, one thousand nine hundred forty-two.

M. C. Hinderlider
Commissioner for Colorado
George S. Knapp
Commissioner for Kansas
Wardner G. Scott
Commissioner for Nebraska

SPECIAL ACTS AND RESOLUTIONS

§ 1-106

I have participated in the negotiations leading to this proposed compact and propose to report to the Congress of the United States favorably thereon.

Glenn L. Parker

Representative of the United States.

Sec. 2. That Chapter 92, Session Laws of Nebraska, 1941, is repealed.

Sec. 3. Since an emergency exists, this act shall be in full force and take effect, from and after its passage and approval, according to law.

Source: Laws 1943, c. 109, p. 377.

REPUBLICAN RIVER COMPACT

Rules and Regulations

constituting

The Republican River Compact Administration

The Republican River Compact

After negotiations by Commissioners appointed by Governors of the States of Kansas, Nebraska and Colorado, and participated in by a duly appointed Representative of the United States of America, the Commissioners signed, and the Representative of the United States of America approved, the Republican River Compact on December 31, 1942. It was ratified by the State of Colorado by an Act effective on March 15, 1943; by the State of Kansas by an Act effective on June 28, 1943; and by the State of Nebraska by an Act effective on February 24, 1943. The Compact was approved by the Congress of the United States in an Act effective on May 26, 1943. (Public Law 60, 78th Congress, Chapter 104, 1st Session).

Administration of the Compact

Article IX of the Republican River Compact provides for its administration as follows:

Article IX.

It shall be the duty of the three States to administer this compact through the official in each State who is now or may hereafter be charged with the duty of administering the public water supplies, and to collect and correlate through such officials the data necessary for the proper administration of the provisions of this compact. Such officials may, by unanimous action, adopt rules and regulations consistent with the provisions of this compact.

The United States Geological Survey, or whatever federal agency may succeed to the functions and duties of that agency, in so far as this compact is concerned, shall collaborate with the officials of the States charged with the administration of this compact in the execution of the duty of such officials in the collection, correlation, and publication of water facts necessary for the proper administration of this compact.

Rules and Regulations

Pursuant to the responsibility and authority conferred upon them by the Republican River Compact, and for the purpose of implementing its administration, J. E. Whitten, State Engineer of the State of Colorado; Dan S. Jones, Jr., Director of Water Resources of the State of Nebraska; and R. V. Smrha, Chief Engineer, Division of Water Resources, State Board of Agriculture of the State of Kansas, being the officials in their respective states charged with the duty of administering public water supplies, assembled in meeting at Denver, Colorado, on July 15, 1959, and unanimously approved and adopted as being effective from that date, rules and regulations as follows:

1. The State Engineer of the State of Colorado; the Director of Water Resources of the State of Nebraska; and the Chief Engineer, Division of Water Resources, State Board of Agriculture of the State of Kansas, being the officials in their respective states charged with the duty of administering public water supplies, shall be the official members of and together they shall constitute an administrative body hereby designated, "The Republican River Compact Administration".
2. The Republican River Compact, hereinafter referred to as the "Compact", shall be administered by the Republican River Compact Administration, hereinafter referred to as the "Administration".
3. The terms of office of official members of the Administration shall be concurrent with their respective terms of office as officials of each state charged with the duty of administering the public water supplies.

4. Each official member of the Administration shall be recognized in that capacity upon furnishing to the other official members satisfactory evidence that he is the official in his state charged with the duty of administering the public water supplies.
5. If an official member shall be unable to serve personally at any meeting of the Administration, he may appoint a personal representative, other than another official member of the Administration, to serve in his place at said meeting. Such personal representative shall be recognized in that capacity upon furnishing to the official members from the other states or their personal representatives a certificate showing that he has been duly appointed by the official member whom he is to represent. All actions taken in the transaction of business of the Administration by any such duly appointed representative shall be made in the name of the official member whom he represents and shall be binding on such official member.
6. The Chairman of the Administration shall be an official member of the Administration and shall be elected at the annual meeting for a term of office continuing to the close of the annual meeting the following year. In the absence of the Chairman at any meeting, the official members of the Administration and any duly appointed and acting personal representatives present at that time shall select one of them to serve as temporary Chairman. In the event of a vacancy in the office of the Chairman, his successor as the official member from his state shall be temporary Chairman until the next meeting of the Administration at which time, as the first order of business, the vacancy shall be filled by election of an official member of the Administration who shall thereupon be Chairman for the unexpired term.

7. The Chairman shall preside at all meetings of the Administration and may initiate or second motions and vote on all matters coming before the Administration. He shall issue notice of meeting to all official members as to time, place, and purpose in advance of each meeting of the Administration. The Chairman shall keep a record of the proceedings of all meetings and of all transactions of the Administration during his term of office and shall furnish copies thereof concurrently to the other official members to the end that each official member shall have and preserve a complete file of the records of the Administration.
8. The Administration may, from time to time, create committees composed of such official members of the Administration and others as it may determine and assign to such committees such tasks as the Administration may designate.
9. A regular annual meeting of the Administration shall be held on the first Tuesday of March each year. Other meetings of the Administration shall be held as may be agreed upon at any meeting; or upon call of the Chairman; or upon written request to the Chairman by any official member of the Administration.
10. A quorum for the purpose of transacting official business at any meeting of the Administration shall be at least two official members of the Administration or their duly appointed representatives. In all matters coming before the Administration any action shall be determined by vote. Each State shall have one vote and every decision, authorization or other action shall require a unanimous vote of the official members or their duly appointed and acting personal representatives present at a meeting.

11. At each meeting of the Administration, the order of business, except as provided by rule No. 6 herein, shall be as follows:

Reading, correction, and approval of minutes of last meeting

Report of Chairman

Reports of official members or representatives

Unfinished business

New business

Adjournment

12. The Administration at each annual meeting shall adopt and enter upon its records a report covering a summary of its transactions and proceedings for the preceding calendar year, the current status of its affairs and including such other matters as may be deemed appropriate by the official members. Copies of the report may be furnished to the President of the United States; the Governors of the States of Colorado, Nebraska and Kansas; officials of State and Federal agencies and others as determined by the Administration.
13. Amendments, revisions, deletions or additions to these Rules and Regulations may be made at any meeting of the Administration, provided that official members or duly appointed and acting personal representatives from all three states are present. Such changes may be made also at any meeting at which a quorum is present, provided that a statement of the proposed changes is sent by the Chairman to all official members of the Administration by ordinary mail at least fifteen (15) days in advance of the meeting at which they are to be considered.

Approval and Adoption

The foregoing Rules and Regulations, deemed to be consistent with provisions of the Republican River Compact and considered necessary for its administration, are hereby approved and adopted.

Done in the City of Denver in the State of Colorado on the 15th day of July, in the year of our Lord, one thousand nine hundred fifty-nine.

For the State of Colorado

/s/ J. E. Whitten
J. E. Whitten, State Engineer

For the State of Nebraska

/s/ Dan S. Jones, Jr.
Dan S. Jones, Jr.
Director of Water Resources

For the State of Kansas

/s/ R. V. Smrha
R. V. Smrha, Chief Engineer
Division of Water Resources
State Board of Agriculture

STATE OF Colorado, Denver COUNTY, ss.

BE IT REMEMBERED, That on this 15th day of July, A. D. 1959, before me the undersigned, a notary public in and for said County and State, came J. E. Whitten, State Engineer of the State of Colorado; Dan S. Jones, Jr., Director of Water Resources of the State of Nebraska, and R. V. Smrha, Chief Engineer, Division of Water Resources, State Board of Agriculture of the State of Kansas, who are personally known to me to be such duly appointed qualified and acting officials, and who are personally known to me to be the same persons who executed the within instrument of writing as such officials and such persons duly acknowledged the execution of the same as such officials.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal, the day and year last above written.

(SEAL)

Signature: /s/ Janice A. Stewart
Notary Public

My commission expires ~~My Commission expires~~ January 24, 1962

Republican River Compact Administration

ACCOUNTING PROCEDURES

AND

REPORTING REQUIREMENTS

Revised August 12, 2010

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I. 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.” This will be the same “base” run used to determine groundwater Computed Beneficial Consumptive Uses.

- 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.”

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 “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 “on”.

The “no State pumping” run shall be the run with the same model inputs as the base 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 “base” 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%
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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. 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

CBCU Colorado = $0.6 \times \text{Haigler Canal Diversion Colorado} + 0.6 \times Dc + \% \times Pc + 0.5 \times M\&Ic + EvNFRc + GWc$

CBCU Kansas = GWk

CBCU Nebraska = $0.6 \times \text{Haigler Canal Diversion Nebraska} + GWn$

Note: The diversion for Haigler Canal is split between Colorado and Nebraska based on the percentage of land irrigated in each state

VWS = $\text{North Fork of the Republican River at the State Line, Stn. No. 06823000} + CBCUc + CBCUk + CBCUn + \text{Nebraska Haigler Canal RF} - IWS$

Note: The Nebraska Haigler Canal RF returns to the Main Stem

CWS = $VWS - FF$

Allocation Colorado = $0.224 \times CWS$

Allocation Nebraska = $0.246 \times CWS$

Unallocated = $0.53 \times CWS$

4. Arikaree River ²

CBCU Colorado = $0.6 \times Dc + \% \times Pc + 0.5 \times M\&Ic + EvNFRc + GWc$

CBCU Kansas = $0.6 \times Dk + \% \times Pk + 0.5 \times M\&Ik + EvNFRk + GWk$

CBCU Nebraska = $0.6 \times Dn + \% \times Pn + 0.5 \times M\&In + EvNFRn + GWn$

VWS = $\text{Arikaree Gage at Haigler Stn. No. 06821500} + CBCUc + CBCUk + CBCUn - IWS$

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.

$$\begin{aligned} \text{CWS} &= \text{VWS} - \text{FF} \\ \text{Allocation Colorado} &= 0.785 \times \text{CWS} \\ \text{Allocation Kansas} &= 0.051 \times \text{CWS} \\ \text{Allocation Nebraska} &= 0.168 \times \text{CWS} \\ \text{Unallocated} &= -0.004 \times \text{CWS} \end{aligned}$$

5. Buffalo Creek

$$\begin{aligned} \text{CBCU Colorado} &= 0.6 \times \text{Dc} + \% \times \text{Pc} + 0.5 \times \text{M\&In} + \text{EvNFRc} + \text{GWc} \\ \text{CBCU Kansas} &= \text{GWk} \\ \text{CBCU Nebraska} &= 0.6 \times \text{Dn} + \% \times \text{Pn} + 0.5 \times \text{M\&In} + \text{EvNFRn} + \text{GWn} \\ \text{VWS} &= \text{Buffalo Creek near Haigler Gage Stn. No. 06823500} + \\ &\text{CBCUc} + \text{CBCUk} + \text{CBCUn} - \text{IWS} \\ \text{CWS} &= \text{VWS} - \text{FF} \\ \text{Allocation Nebraska} &= 0.330 \times \text{CWS} \\ \text{Unallocated} &= 0.670 \times \text{CWS} \end{aligned}$$

6. Rock Creek

$$\begin{aligned} \text{CBCU Colorado} &= \text{GWc} \\ \text{CBCU Kansas} &= \text{GWk} \\ \text{CBCU Nebraska} &= 0.6 \times \text{Dn} + \% \times \text{Pn} + 0.5 \times \text{M\&In} + \text{EvNFRn} + \text{GWn} \\ \text{VWS} &= \text{Rock Creek at Parks Gage Stn. No. 06824000} + \text{CBCUc} + \\ &\text{CBCUk} + \text{CBCUn} - \text{IWS} \\ \text{CWS} &= \text{VWS} - \text{FF} \\ \text{Allocation Nebraska} &= 0.400 \times \text{CWS} \end{aligned}$$

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 x (1-%BRF) + Culbertson Extension x (1-%BRF) + 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

$$\text{CWS} = \text{VWS} - \Delta\text{S Enders Reservoir} - \text{FF}$$

$$\text{Allocation Nebraska} = 0.536 \times \text{CWS}$$

$$\text{Unallocated} = 0.464 \times \text{CWS}$$

9. Driftwood Creek

$$\text{CBCU Colorado} = \text{GWc}$$

$$\text{CBCU Kansas} = 0.6 \times \text{Dk} + \% \times \text{Pk} + 0.5 \times \text{M\&Ik} + \text{EvNFRk} + \text{GWk}$$

$$\text{CBCU Nebraska} = 0.6 \times \text{Dn} + \% \times \text{Pn} + 0.5 \times \text{M\&In} + \text{EvNFRn} + \text{GWn}$$

$$\text{VWS} = \text{Driftwood Creek near McCook Gage Stn. No. 06836500} + \text{CBCUc} + \text{CBCUk} + \text{CBCUn} - 0.24 \times \text{Meeker Driftwood Canal RF - IWS}$$

Note: 24 % of the Meeker Driftwood Canal RF returns to Driftwood Creek

$$\text{CWS} = \text{VWS} - \text{FF}$$

$$\text{Allocation Kansas} = 0.069 \times \text{CWS}$$

$$\text{Allocation Nebraska} = 0.164 \times \text{CWS}$$

$$\text{Unallocated} = 0.767 \times \text{CWS}$$

10. Red Willow Creek in Nebraska

$$\text{CBCU Colorado} = \text{GWc}$$

$$\text{CBCU Kansas} = \text{GWk}$$

$$\text{CBCU Nebraska} = 0.1 \times \text{Red Willow Canal CBCU} + 0.6 \times \text{Dn} + \% \times \text{Pn} + 0.5 \times \text{M\&In} + \text{EvNFRn} + 0.1 \times \text{Hugh Butler Lake Ev} + \text{GWn}$$

Note:

Red Willow Canal CBCU = Red Willow Canal Diversion x (1- % BRF)

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

CWS = VWS - $\Delta\text{S Harry Strunk Lake}$ - FF

Allocation Nebraska = $0.091 \times \text{CWS}$

Unallocated = $0.909 \times \text{CWS}$

12. Beaver Creek

CBCU Colorado = $0.6 \times \text{Dc} + \% \times \text{Pc} + 0.5 \times \text{M\&Ic} + \text{EvNFRc} + \text{Gwc}$

CBCU Kansas = $0.6 \times \text{Dk} + \% \times \text{Pk} + 0.5 \times \text{M\&Ik} + \text{EvNFRk} + \text{Gwk}$

CBCU Nebraska = $0.6 \times \text{Dn above and below gage} + \% \times \text{Pn above and below gage} + 0.5 \times \text{M\&In above and below gage} + \text{EvNFRn above and below gage} + \text{Gwn}$

VWS = 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

CWS = VWS - FF

Allocation Colorado = $0.200 \times \text{CWS}$

Allocation Kansas = $0.388 \times \text{CWS}$

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

$$\begin{aligned} \text{CWS} &= \text{VWS} - \Delta\text{S Keith Sebelius Lake} - \text{FF} \\ \text{Allocation Kansas} &= 0.457 \times \text{CSW} \\ \text{Allocation Nebraska} &= 0.076 \times \text{CWS} \\ \text{Unallocated} &= 0.467 \times \text{CWS} \end{aligned}$$

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

$$\begin{aligned} \text{CBCU Colorado} &= \text{GWc} \\ \text{CBCU Kansas} &= \\ &(\text{Deliveries from the Courtland Canal to Kansas above Lovewell}) \times (1 - \% \text{BRF}) \\ &+ \text{Amount of transportation loss of Courtland Canal deliveries to Lovewell that does not return to the river, charged to Kansas} \\ &+ (\text{Diversion of Republican River water from Lovewell Reservoir by the Courtland Canal below Lovewell}) \times (1 - \% \text{BRF}) \\ &+ 0.6 \times \text{Dk} \\ &+ \% \times \text{Pk} \\ &+ 0.5 \times \text{M\&Ik} \\ &+ \text{EvNFRk} \\ &+ \text{Harlan County Lake Ev charged to Kansas} \\ &+ \text{Lovewell Reservoir Ev charged to the Republican River} \\ &+ \text{GWk} \\ \text{CBCU Nebraska} &= \\ &\text{Deliveries from Courtland Canal to Nebraska lands} \times (1 - \% \text{BRF}) \end{aligned}$$

- + Superior Canal x (1- %BRF)
- + Franklin Pump Canal x (1- %BRF)
- + Franklin Canal x (1- %BRF)
- + Naponee Canal x (1- %BRF)
- + Cambridge Canal x (1- %BRF)
- + Bartley Canal x (1- %BRF)
- + Meeker-Driftwood Canal x (1- %BRF)
- + 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 (1- % BRF)

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 x (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 x CWS

Allocation Nebraska = 0.489 x 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

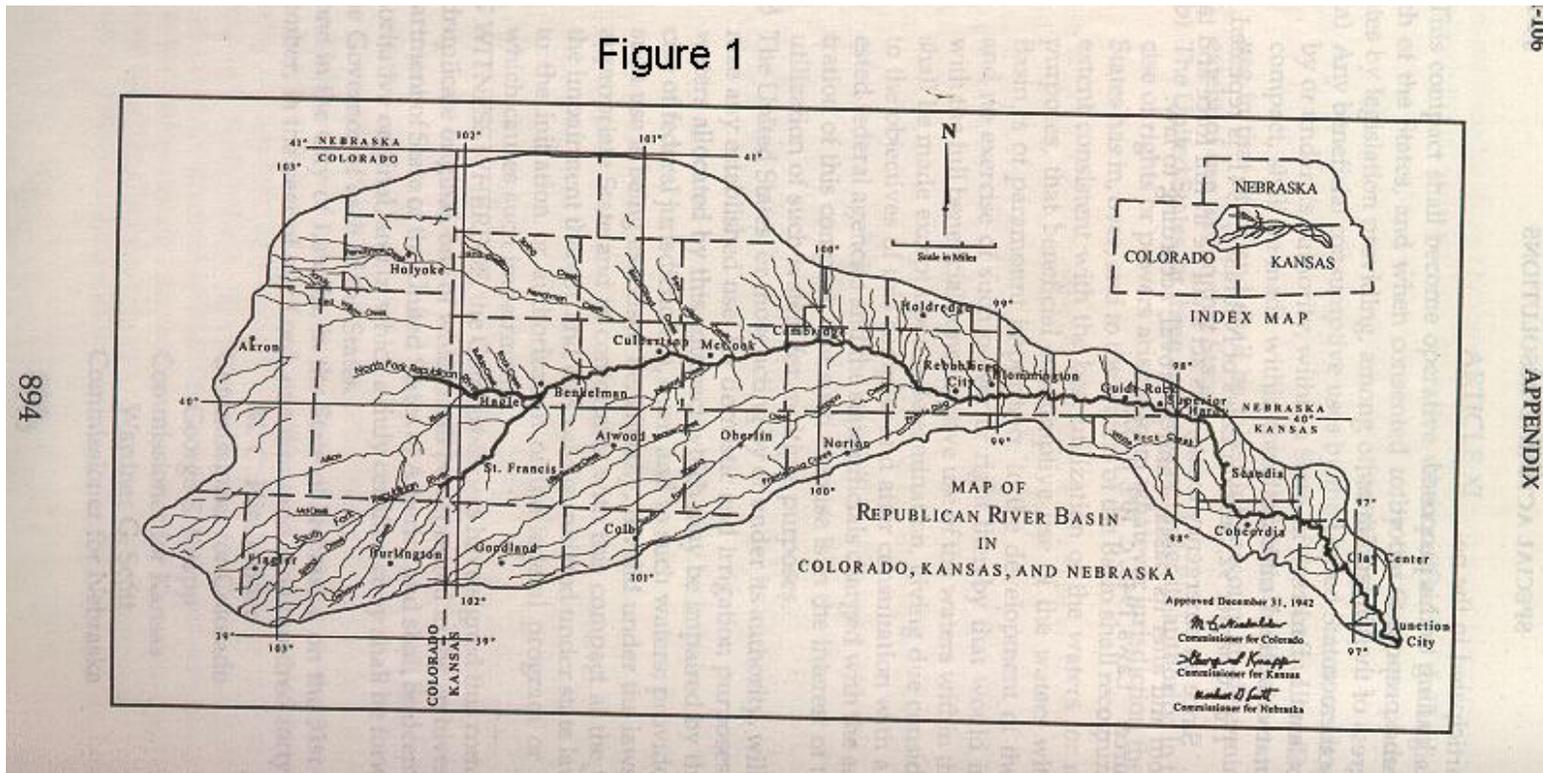
Nebraska								
Year	Allocation			Computed Beneficial Consumptive Use			Imported Water Supply Credit	Difference Between Allocation and the Computed Beneficial Consumptive Use offset by Imported Water Supply Credit Above Guide Rock
Column	Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8
	State Wide Allocation	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								

Table 5D: Nebraska Compliance Under a Alternative Water-Short Year Administration Plan

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								

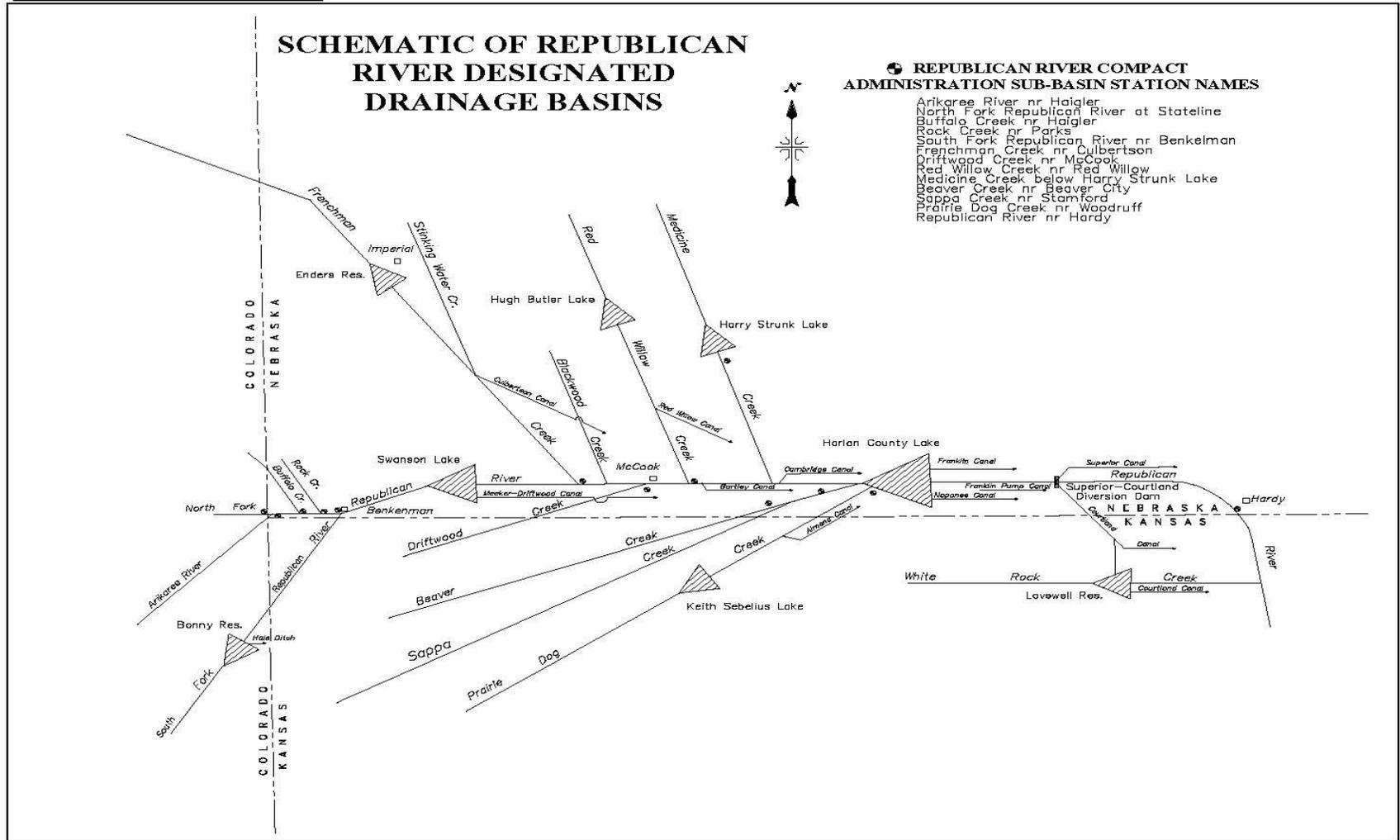
Table 5E: Nebraska Tributary Compliance During Water-Short Year Administration

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						



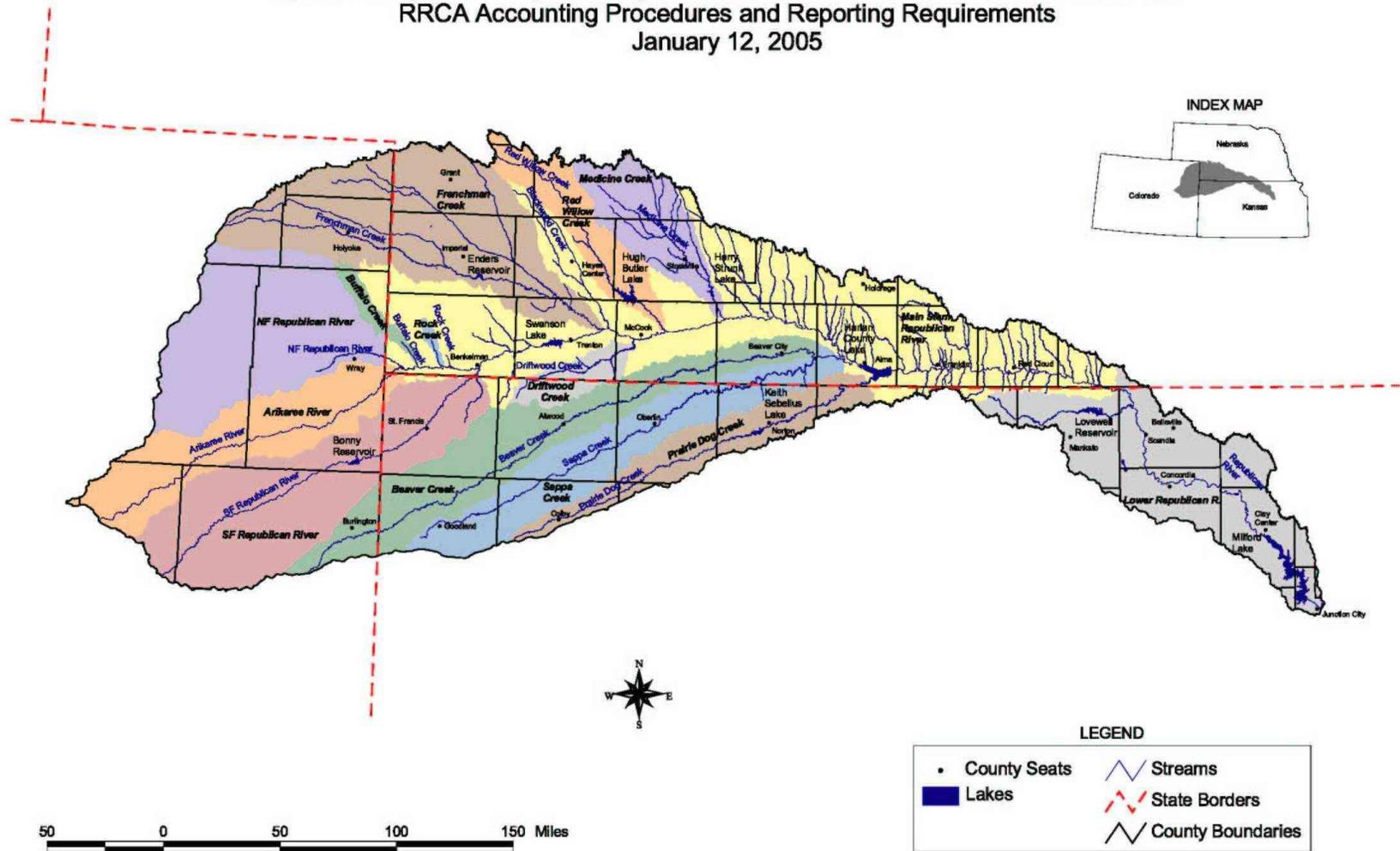
Basin Map Attached to Compact that Shows the Streams and the Basin Boundaries

Figure 2



Line Diagram of Designated Drainage Basins Showing Federal Reservoirs and Sub-basin Gaging Stations

Update of Figure 3 - Map Showing Sub-basins, Streams, and the Basin Boundaries
RRCA Accounting Procedures and Reporting Requirements
January 12, 2005



Map Showing Sub-basins, Streams, and the Basin Boundaries

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.

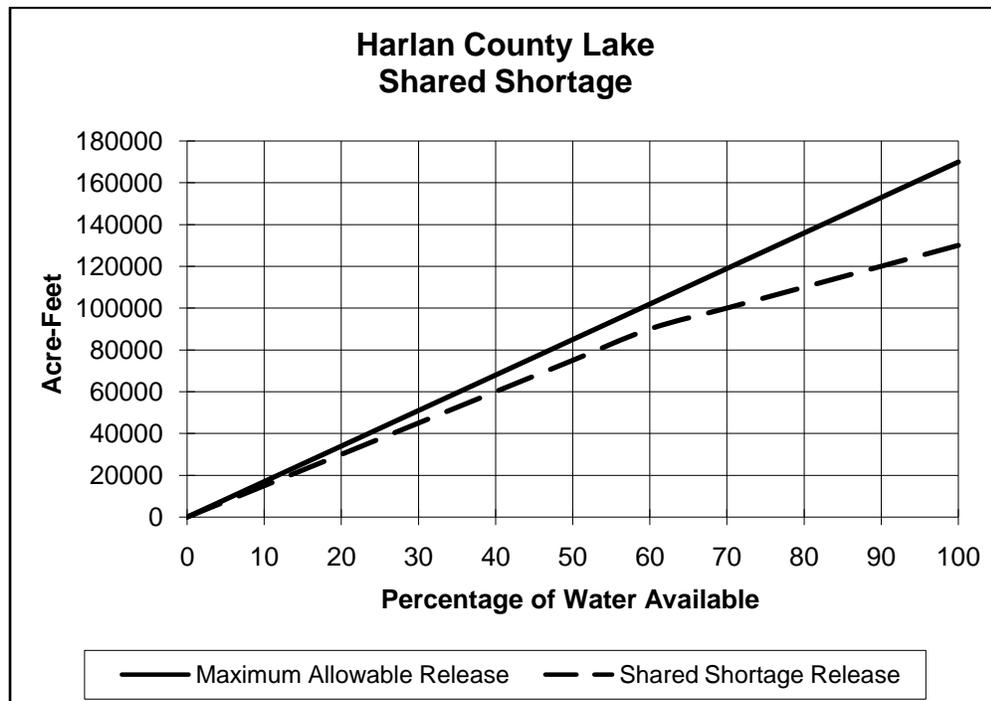
Since the construction of Harlan County Lake, inflows to the lake have been depleted by upstream irrigation wells and farming practices. Reclamation has recently completed an in-depth study of these depleted flows as a part of their contract renewal process. The study concluded that if the current conditions 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

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
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								
130 kAF Irrigation Supply - Yes/No	NO									

Attachment 5: Projected Water Supply Spread Sheet Calculations

Year 2002				
Jul - Sep				
Final Trigger and				
Total Irrigation Supply				
Calculation				
Calculation Month		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
Canal	Canal Diversion	Spill to Waste-way	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	Sum of deliveries to the field	+Col 2 - Col 4	1 -Weighted Average Efficiency of Application System for the District*	Col 4 x Col 6	Col 5 + Col 7	Estimated Percent Loss*	Columns 8 x Col 9	Col 10/Col 2
Example	100	5	60	40	30%	18	58	82%	48	48%
Culbertson					30%					
Culbertson Extension					30%					
Meeker-Driftwood					30%					
Red Willow					30%					
Bartley					30%					
Cambridge					30%					
Naponne					35%					
Franklin					35%					
Franklin Pump					35%					
Almena					30%					
Superior					31%					
Nebraska Courtland					23%					
Courtland Canal Above Lovewell (KS)					23%					
Courtland Canal Below Lovewell					23%					

*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.

No. 126, Original

In The
SUPREME COURT OF THE UNITED STATES

STATE OF KANSAS,

Plaintiff,

v.

STATE OF NEBRASKA

And

STATE OF COLORADO,

Defendants.

BEFORE THE HONORABLE VINCENT L. MCKUSICK
SPECIAL MASTER

JOINT MOTION OF THE STATES FOR ENTRY OF PROPOSED
CONSENT JUDGMENT AND APPROVAL AND ADOPTION OF
FINAL SETTLEMENT STIPULATION

COME NOW the Parties and respectfully move the United States Supreme Court to enter the Parties' Proposed Consent Judgment approving and adopting the Final Settlement Stipulation executed by all the Parties to this case and presented to the Special Master on December 15, 2002, and dismiss the above-styled Original Action with prejudice.

Dated December 15, 2002.

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No. 126, Original

In The

SUPREME COURT OF THE UNITED STATES

STATE OF KANSAS,

Plaintiff,

v.

STATE OF NEBRASKA

And

STATE OF COLORADO,

Defendants.

BEFORE THE HONORABLE VINCENT L. MCKUSICK
SPECIAL MASTER

FINAL SETTLEMENT STIPULATION

December 15, 2002

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The States of Kansas, Nebraska and Colorado, hereby enter into this Final Settlement Stipulation as of December 15, 2002:

I. General

- A. The States agree to resolve the currently pending litigation in the United States Supreme Court regarding the Republican River Compact by means of this Stipulation and the Proposed Consent Judgment attached hereto as Appendix A.
- B. The States agree to undertake the obligations set forth in this Stipulation. The States shall implement the obligations and agreements in this Stipulation in accordance with the schedule attached hereto as Appendix B.
- C. Upon the Court's approval of this Stipulation and entry of the Proposed Consent Judgment, the States agree that all claims against each other relating to the use of the waters of the Basin pursuant to the Compact with respect to activities or conditions occurring before December 15, 2002, shall be waived, forever barred and dismissed with prejudice. These claims shall include all claims for Compact violations, damages, and all claims asserted or which could have been asserted in the pending proceeding, No. 126, Original.
- D. With respect to activities or conditions occurring after December 15, 2002, the dismissal will not preclude a State from seeking enforcement of the provisions of the Compact, this Stipulation and the Proposed Consent Judgment. Nor will the dismissal preclude any State in such future action from asserting any legal theories it raised in the present proceeding, or any other legal theories, with respect to activities or conditions occurring after the date of such dismissal. The States agree that this Stipulation and the Proposed Consent Judgment are not intended to, nor could they, change the States' respective rights and obligations under the Compact. The States reserve their respective rights under the Compact to raise

any issue of Compact interpretation and enforcement in the future.

- E. Specific information-sharing requirements are set forth in the RRCA Accounting Procedures, attached hereto as Appendix C. The States will provide each other with the opportunity to inspect and copy their records pertaining to water use in the Basin, other than privileged materials, upon request. The States will cooperate in arranging verification as reasonably necessary.
- F. The RRCA may modify the RRCA Accounting Procedures, or any portion thereof, in any manner consistent with the Compact and this Stipulation.
- G. Headings in this Stipulation are provided for convenience only and shall not affect the substance of any provision.
- H. This Stipulation supersedes the Settlement Principles signed by the States on April 30, 2002.
- I. The provisions of Subsection IV.C. relating to the development of the RRCA Groundwater Model shall be in effect and enforceable between December 15, 2002 and July 1, 2003 or until the Court's approval or disapproval of this Stipulation, whichever is later.
- J. Within six months of the final dismissal of this case, the RRCA shall revise its existing rules and regulations as necessary to make them consistent with this Stipulation and the RRCA Accounting Procedures.

II. Definitions

Wherever used in this Stipulation the following terms are defined as:

Acre-foot: The quantity of water required to cover an acre to the depth of one foot, equivalent to forty-three thousand, five hundred sixty (43,560) cubic feet;

Actual Interest: A State will be deemed to have an actual interest in a dispute if resolution of the dispute could require action by the State, result in increasing or decreasing the amount of water available to a State, affect the State's ability to monitor or administer water use or water availability, or increase the State's financial obligations;

Addressed by the RRCA: A matter is deemed to be addressed by the RRCA when the RRCA has taken final action by vote on such request or failed to take action by vote on the request after a Reasonable Opportunity to investigate and act on the request;

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

Annual: As defined in the RRCA Accounting Procedures Section II;

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

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: The stream flow depletion resulting from the activities of man as listed in the definition of Computed Beneficial Consumptive Use in the RRCA Accounting Procedures Section II;

Computed Water Supply: As defined in the RRCA Accounting Procedures Section II;

Conservation Committee: The conservation measures study committee established in Subsection VI.B.1;

Court: The United States Supreme Court;

Designated Drainage Basins: The drainage basins of the specific tributaries and Main Stem of the Republican River as described in Article III of the Compact;

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 the RRCA Accounting Procedures, Subsection III.B.1.;

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 that State's Allocation, except as provided in Subsection V.B.2. of this Stipulation and Subsections III.I. – J. of the 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;

Modeling Committee: The joint groundwater modeling committee established in Subsection IV.C.;

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

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;

Proposed Consent Judgment: The document attached hereto as Appendix A;

Reasonable Opportunity: The RRCA will be deemed to have had a reasonable opportunity to investigate and act on a regular request when, at a minimum, the issue has been discussed at the next regularly scheduled annual meeting. If the RRCA agrees that an issue requires additional investigation, the RRCA may specify a period of time that constitutes a reasonable opportunity for completion of such investigation and final action on the particular issue. The RRCA will be deemed to have had a reasonable opportunity to investigate and act on a “fast-track” request when the issue has been discussed at a meeting of the RRCA no later than 30 days after the “fast-track” issue has been raised. If the RRCA agrees that a “fast track” issue requires additional investigation, the RRCA may specify a period of time that constitutes a reasonable opportunity for completion of such investigation and final action on the particular issue;

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 described in Subsections III.B.1.c.- f. of this Stipulation;

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

RRCA Accounting Procedures: The document titled “The Republican River Compact Administration Accounting Procedures and Reporting Requirements” and all attachments thereto, attached hereto as Appendix C;

RRCA Groundwater Model: The groundwater model developed under the provisions of Subsection IV.C. of this Stipulation;

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

States: The States of Colorado, Kansas and Nebraska;

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

Sub-basin: Any of the Designated Drainage Basins, except for the Main Stem, identified in Article III of the Compact;

Submitted to the RRCA: A matter is deemed to have been submitted to the RRCA when a written statement requesting action or decision by the RRCA has been delivered to the other RRCA members by a widely accepted means of communication and receipt has been confirmed;

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

Trenton Dam: The 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. Attached to this Stipulation in Appendix D is a map that shows the areas upstream of Guide Rock, Nebraska. In the event of any conflict between this definition and Appendix D, this definition will control;

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

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. Existing Development

A. Moratorium on New Wells

1. Except as provided below, the States hereby adopt a prohibition on the construction of all new Wells in the Basin upstream of Guide Rock, Nebraska (hereinafter "Moratorium"). The Moratorium may be modified, in whole or in part, by the RRCA if it determines that new information demonstrates that additional groundwater development in all or any part of the Basin that is subject to the Moratorium would not cause any State to consume more than its Allocations from the available Virgin Water Supply as calculated pursuant to Section IV of this Stipulation. New information shall mean results from the RRCA Groundwater Model or any other appropriate information. Attached hereto in Appendix E, are such laws, rules and regulations in Nebraska concerning the prohibition on construction of new Wells in the Basin.

2. Nothing in this Stipulation, and specifically this Subsection III.A., shall extend the Moratorium or create an additional Moratorium in any of the States in any other river basin or in any other groundwater supply located outside of the Basin.
3. Notwithstanding the provision in Subsection III.A.1. of this Stipulation permitting the RRCA to modify the prohibition on construction of new Wells, the States will not increase the level of development of Wells as of July 1, 2002 in the following Designated Drainage Basins, subject to the exceptions set forth in Subsection III.B.1-2.:

North Fork of the Republican River in Colorado
Arikaree River
South Fork of the Republican River
Buffalo Creek
Rock Creek

That portion of the North Fork and Main Stem of the Republican River in Nebraska that lies upstream of Trenton Dam.

Any of the States may seek to amend this provision of this Stipulation by making application to the Court upon any change in conditions making modification of this Subsection III.A.3. necessary or appropriate.

B. Exceptions to Moratorium on New Wells

1. The Moratorium shall not apply to the following:
 - a. Any and all Wells in the Basin located within the current boundaries of the following Natural Resource Districts in Nebraska:
 - i. The Tri-Basin Natural Resource District;
 - ii. The Twin Platte Natural Resource District;
and

iii. The Little Blue Natural Resource District.

Attached to this Stipulation in Appendix D is a map that shows the areas described in this Subsection III.B.1.a. In the event of any conflict between this Subsection and Appendix D, this Subsection will control;

b. Any and all Wells in the Basin in Nebraska located in the following described areas:

- i. Lincoln County, Township 9, Range 27, Sections 5-7;
- ii. Lincoln County, Township 9, Range 28, Sections 1-23, 28-30;
- iii. Lincoln County, Township 9, Range 29, Sections 1-18, 21-26;
- iv. Lincoln County, Township 9, Range 30, Sections 1-6, 8-13;
- v. Lincoln County, Township 9, Range 31, Sections 1-2;
- vi. Lincoln County, Township 10, Range 27, Sections 19-24, 27-33;
- vii. Lincoln County, Township 10, Range 28, Sections 1-36;
- viii. Lincoln County, Township 10, Range 29, Sections 1-36;
- ix. Lincoln County, Township 10, Range 30, Sections 1-36;

- x. Lincoln County, Township 10, Range 31, Sections 1-18, 20-27 and 34-36;
- xi. Lincoln County, Township 10, Range 32, Sections 1-4 and 10-13;
- xii. Lincoln County, Township 11, Range 28, Sections 28-35;
- xiii. Lincoln County, Township 11, Range 29, Sections 19-36;
- xiv. Lincoln County, Township 11, Range 30, Sections 19-36;
- xv. Lincoln County, Township 11, Range 31, Sections 19-36;
- xvi. Lincoln County, Township 11, Range 32, Sections 19-36;
- xvii. Lincoln County, Township 11, Range 33, Sections 19-30, 32-36;
- xviii. Lincoln County, Township 11, Range 34, Sections 21-27;
- xix. Frontier County, Township 6, Range 24, Sections 1-36;
- xx. Frontier County, Township 7, Range 24, Sections 1-36; and,
- xxi. Frontier County, Township 8, Range 24, Sections 19-21 and 27-36.

Attached to this Stipulation in Appendix D is a map that shows the areas described in this Subsection III.B.1.b. In the event of any conflict

between this Subsection and Appendix D, this Subsection will control.

- c. Test holes;
- d. Dewatering Wells with an intended use of one year or less;
- e. Wells designed and constructed to pump fifty gallons per minute or less, provided that no two or more Wells that pump fifty gallons per minute or less may be connected or otherwise combined to serve a single project such that the collective pumping would exceed fifty gallons per minute;
- f. Wells designed and constructed to pump 15 Acre-feet per year or less, provided that no two or more Wells that pump 15 Acre-feet per year or less may be connected or otherwise combined to serve a single project such that the collective pumping would exceed 15 Acre-feet per year;
- g. Replacement Wells, subject to all limitations or permit conditions on the existing Well, or in the absence of any limitation or permit condition only if the Beneficial Consumptive Use of water from the new Well is no greater than the Historic Consumptive Use of water from the Well it is to replace. Nebraska will calculate Historic Consumptive Use in the manner proposed in Appendix F. Nebraska shall not change its proposed method of calculating Historic Consumptive Use before providing notice to the RRCA;
- h. Wells necessary to alleviate an emergency situation involving the provision of water for human consumption or public health and safety;

- i. Wells to which a right or permit is transferred in accordance with state law, provided however, that the new Well:
 - (i) consumes no more water than the Historic Consumptive Use of water under the right or permit that is being transferred; and
 - (ii) is not a transfer of a right or permit that would cause an increased stream depletion upstream of Trenton Dam.

Nebraska will calculate Historic Consumptive Use in the manner proposed in Appendix F. Nebraska shall not change its proposed method of calculating Historic Consumptive Use before providing notice to the RRCA;

- j. Wells for expansion of municipal and industrial uses. Any new Wells for these purposes shall be counted against the State's Allocation and, to the extent a State is consuming its full Allocation, other uses shall be reduced to stay within the State's Allocation; and
- k. Wells acquired or constructed by a State for the sole purpose of offsetting stream depletions in order to comply with its Compact Allocations. Provided that, such Wells shall not cause any new net depletion to stream flow either annually or long-term. The determination of net depletions from these Wells will be computed by the RRCA Groundwater Model and included in the State's Computed Beneficial Consumptive Use. Augmentation plans and related accounting procedures submitted under this Subsection III.B.1.k. shall be approved by the RRCA prior to implementation.

2. The Moratorium shall not apply to nor create any additional limitations on new Wells in Northwest Kansas and Colorado in the Basin other than those imposed by state laws, rules and regulations in existence as of April 30, 2002. Provided however, that the Historic Consumptive Use of a Well in Colorado or Northwest Kansas that is or would have been accounted for in Compact accounting as a stream depletion reaching the Republican River downstream of Trenton Dam may not be transferred to a Well that would cause a depletion reaching the Republican River upstream of Trenton Dam. Further, neither Colorado nor Kansas shall change their laws, rules or regulations in existence as of April 30, 2002, to the extent that such changes would result in restrictions less stringent than those set forth in Subsection III.B.1. above. Attached hereto in Appendices G and H, respectively, are such laws, rules and regulations in Northwest Kansas and Colorado in existence as of April 30, 2002.

C. Surface Water Limitations

Each of the States has closed or substantially limited its portion of the Basin above Hardy, Nebraska to new surface water rights or permits. Each State agrees to notify each Official Member of the RRCA and the U. S. Bureau of Reclamation at least 60 days prior to a new surface water right or permit being granted or prior to adopting changes to its current restrictions related to granting new surface water rights or permits in the Basin above Hardy, Nebraska and provide the RRCA an opportunity for discussion. Each State, however, reserves the right to allow new surface water rights or permits to use additional surface water if such use can be made within the State's Compact Allocation.

D. Reporting

Beginning on April 15, 2003, or such other date as may be agreed to by the RRCA and on the same date each year thereafter, each State will provide the other States with an annual report for the previous year of all Well construction in

the State within the Basin Upstream of Guide Rock, Nebraska and all denials of Well permits or other requests for Well construction. The report shall include such information as required by the RRCA Accounting Procedures, Section V.

IV. Compact Accounting

- A. The States will determine Virgin Water Supply, Computed Water Supply, Allocations, Imported Water Supply Credit, augmentation credit and Computed Beneficial Consumptive Use based on a methodology set forth in the RRCA Accounting Procedures, attached hereto as Appendix C.
- B. Water derived from Sub-basins in excess of a State's specific Sub-basin Allocations is available for use by each of the States to the extent that:
 - 1. such water is physically available;
 - 2. use of such water does not impair the ability of another State to use its Sub-basin Allocation within the same Sub-basin;
 - 3. use of such water does not cause the State using such water to exceed its total statewide Allocation; and
 - 4. if Water-Short Year Administration is in effect, such use is consistent with the requirements of Subsection V.B.
- C. Determination of stream flow depletions caused by Well pumping and determination of Imported Water Supply Credit will be accomplished by the RRCA Groundwater Model as used in the RRCA Accounting Procedures.
 - 1. Stream flow depletions caused by Well pumping for Beneficial Consumptive Use will be included in the determination of Virgin Water Supply, Computed Water Supply, Allocations and Computed Beneficial Consumptive Use in accordance with the formulas in the RRCA Accounting Procedures provided that the RRCA

may agree to exclude from such accounting minimal stream flow depletions. Stream flow depletions caused by Well pumping for Beneficial Consumptive Use will be counted as Virgin Water Supply and Computed Beneficial Consumptive Use at the time and to the extent the stream flow depletion occurs and will be charged to the State where the Beneficial Consumptive Use occurs.

2. The States agree to devote the necessary time and resources, subject to legislative appropriations, to complete the RRCA Groundwater Model in consultation with the appropriate United States agencies.
3. The States have created a Modeling Committee, comprised of members designated by the States and the United States. Each State may appoint at least one member but no more than three to the Modeling Committee. The United States may designate no more than two representatives to the Modeling Committee. The Modeling Committee shall develop a groundwater model acceptable to the States to accomplish the purposes set forth in this Subsection IV.C. The meetings and other work of the Modeling Committee shall be subject to the Confidentiality Agreement dated October 19, 2001, signed by the States and the United States, attached hereto as Appendix I.

Nothing in this Stipulation shall be construed as limiting the attendance and observation by non-member representatives of the participants at any meeting of the Modeling Committee or participation by non-members in the independent work of the States and United States representatives.

4. The States and the United States have agreed to freely and immediately share all available data, information, expert knowledge, and other information necessary for the Modeling Committee to complete the modeling work as requested by any member of the Modeling Committee. Data and information is considered to be “available” if it

is not otherwise privileged and is (1) used by a State in the modeling process, or (2) is in the possession or control of a State, including its political subdivisions, in the form that the information exists at the time of the request. Data and information “necessary to complete the modeling work” also includes any available information to verify any other data and information. Shared information shall be subject to the Confidentiality Agreement dated October 19, 2001, signed by the States and the United States.

5. If at any time, the members of the Modeling Committee cannot reach agreement on necessary modifications to the RRCA Groundwater Model or any other issues, the Modeling Committee shall report the nature of the dispute to the States promptly and the States shall resolve the dispute as soon as possible.
6. The structure of the RRCA Groundwater Model, together with agreed upon architecture, parameters, procedures and calibration targets as of November 15, 2002, are described in the memorandum attached hereto as Appendix J.
7. The Modeling Committee shall submit the RRCA Groundwater Model to the States in final form with sufficient time for the States to review and agree to the RRCA Groundwater Model by July 1, 2003.
8. Upon agreement by the States to the RRCA Groundwater Model, the States, through the RRCA, shall adopt the RRCA Groundwater Model for purposes of Compact accounting. Following final dismissal of this case, the RRCA may modify the RRCA Groundwater Model or the associated methodologies after discussion with the U.S. Geological Survey.
9. Between December 15, 2002 and July 1, 2003, if the States are unable to agree upon the final RRCA Groundwater Model or if any disputes arise in the

Modeling Committee that the States cannot resolve, the dispute will be submitted to binding expert arbitration for resolution as set forth in this Subsection IV.C.9. No State may invoke binding arbitration unless it has first raised the issue it seeks to have arbitrated in the Modeling Committee and to the States as provided for in Subsection IV.C.5. For purposes of this Subsection IV.C.9., written communications required by this Subsection IV.C.9. shall be provided by both U.S. Mail and by facsimile to both counsel of record and the Official Member of the RRCA for each State and to counsel of record for the United States.

- a. Initiation: Any State may invoke binding arbitration by providing written notice to the other States on or before July 1, 2003. A copy of any notice will be provided to the United States at the same time. Notice for the purposes of this Section shall include a written description of the scope of the dispute, with sufficient detail to provide the States with an understanding of the substance of the dispute and all related issues, a description of all attempts to resolve the dispute and sufficient information for the other States to identify the technical skills that should be possessed by potential arbitrators necessary to resolve the dispute. Upon receipt of notice, each State has five business days to amend the scope of the dispute in writing to address additional issues. If unforeseen issues are identified after the deadline for amending the scope of the dispute, they may be added upon agreement of the States or at the discretion of the arbitrator.
- b. Selection: Upon receipt of notice of a dispute, the States shall confer within the deadlines set forth below to choose an arbitrator(s) and the States will in good faith attempt to agree on an arbitrator(s).

- i. Within seven business days of receipt of the initial notice, each State shall submit the names of proposed arbitrators, including qualifications, to the other States. Within seven business days of receipt of the proposed names, the States will meet, in person or by telephone conference, and confer to agree on an arbitrator(s).
- ii. If the States are unable to agree on an arbitrator(s), within seven business days each State will propose an arbitrator(s), not to exceed two and shall submit the proposed names to the other States and the United States in writing within the time set forth below. Upon receipt of each State's list of proposed arbitrators, within seven business days each State will rank and comment on each proposed arbitrator and submit those comments in writing to the Special Master. The United States, as amicus, may submit rankings and comments to the Special Master. The Special Master will initially eliminate any proposed arbitrators from consideration based upon objections by any State of conflict and/or bias. If all of a State's choices are eliminated by conflict and/or bias, a State may submit the name of an additional arbitrator and each State and the United States may provide comments and objections based on conflict and/or bias within a time limit set by the Special Master.
- iii. Any person submitted as a possible arbitrator by any State shall not be an employee or agent of any State, shall be a person knowledgeable in groundwater modeling, and shall disclose any actual or potential conflict of interest and all current

or prior contractual and other relationships with any person or entity who could be directly affected by resolution of the dispute. Any person who has a contractual relationship with any State shall be automatically disqualified for conflict of interest unless the other States expressly agree in writing to submission of that person's name to the Special Master. Any other contested claims of conflict or bias will be resolved by the Special Master.

- iv. The Special Master will then choose an arbitrator(s) from the remaining non-conflicted choices.
- c. First Arbitration Meeting: Upon selection of an arbitrator(s), the arbitrator(s) shall, within seven business days, hold an initial meeting or conference with the States and the United States, as amicus, to determine a schedule and procedures for exchange of information necessary to resolve the dispute, and for submission and resolution of the pending dispute. The arbitrator(s) may also include disputes arising under Subsection IV.C.4. The arbitrator(s) will be subject to the Confidentiality Agreement dated October 19, 2001, signed by the States and the United States.
- d. Costs: The arbitrator(s)' costs shall be paid equally by the States, subject to appropriations by the States respective legislatures. Each State and the United States, as amicus, shall bear its own costs.
- e. Reporting: The arbitrator(s)' decision will be provided to the States and the United States, as amicus, within ten business days of the close of submissions to the arbitrator(s) unless otherwise shortened or extended by agreement of all of the

States. The arbitrator(s)' written report of decision and findings will be submitted to the States and the United States, as amicus, within thirty days of providing the arbitrator(s)' decision.

- f. Implementation: If the dispute is one involving the ongoing work of the Modeling Committee, the decision of the arbitrator(s) as to the resolution of the dispute shall be implemented by the Modeling Committee and their efforts shall proceed. If the dispute resolves the final RRCA Groundwater Model, the decision of the arbitrator(s) as to the final RRCA Groundwater Model shall be adopted by the RRCA for the purposes of Compact accounting.
- D. Except as described in Subsection V.B., all Compact accounting shall be done on a five-year running average in accordance with the provisions of the RRCA Accounting Procedures, attached as Appendix C. Flood flows will be removed as specified in the RRCA Accounting Procedures.
- E. The States agree to pursue in good faith, and in collaboration with the United States, system improvements in the Basin, including measures to improve the ability to utilize the water supply below Hardy, Nebraska on the main stem. The States also agree to undertake in collaboration with the United States a system operations study and after completion of the study the States will revisit the five-year running average set forth in Subsection IV.D.
- F. Beneficial Consumptive Use of Imported Water Supply shall not count as Computed Beneficial Consumptive Use or Virgin Water Supply. Credit shall be given for any remaining Imported Water Supply that is reflected in increased stream flow, except as provided in Subsection V.B. Determinations of Beneficial Consumptive Use from Imported Water Supply (whether determined expressly or by implication), and any Imported Water Supply Credit shall be calculated in accordance

with the RRCA Accounting Procedures and by using the RRCA Groundwater Model.

- G. Measurement techniques, data collection and reporting to facilitate implementation of the Stipulation are set forth in the RRCA Accounting Procedures.
- H. Augmentation credit, as further described in Subsection III.B.1.k., shall be calculated in accordance with the RRCA Accounting Procedures and by using the RRCA Groundwater Model.

V. Guide Rock

A. Additional Water Administration

1. To provide for regulation of natural flow between Harlan County Lake and Superior-Courtland Diversion Dam, Nebraska will recognize a priority date of February 26, 1948 for Kansas Bostwick Irrigation District, which is the same priority date as the priority date held by the Nebraska Bostwick Irrigation District's Courtland Canal water right.
2. When water is needed for diversion at Guide Rock and the projected or actual irrigation 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 this Stipulation, Nebraska will close junior, and require compliance with senior, natural flow diversions of surface water between Harlan County Lake and Guide Rock. A description of the implementation of the water administration obligations in this Subsection V.A.2.is attached hereto as Appendix L. The RRCA may modify Appendix L in any manner consistent with this Stipulation and the Compact.

3. Nebraska will protect storage water released from Harlan County Lake for delivery at Guide Rock from surface water diversions.
4. Kansas and Nebraska, in collaboration with the United States, agree to take actions to minimize the bypass flows at Superior-Courtland Diversion Dam. A description of the process for meeting the obligations in this Subsection V.A.4 is attached hereto as Appendix L. The RRCA may modify this process in any manner consistent with this Stipulation and the Compact.

B. Water-Short Year Administration

1. Identification of Water-Short Year Administration:
 - a. Water-Short Year Administration will be in effect in those years in which the projected or actual irrigation 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. If system operations enhancements below Harlan County Lake increase the useable supply to the Bostwick Irrigation Districts, the trigger for Water-Short Year Administration will be adjusted as agreed to by the States and the United States in order to equitably share the benefits of such enhancements. Following the determination that Water-Short Year Administration is in effect, the States will take the actions described in Subsections V.B.2-4.
 - b. Each year between October 1 and June 30, 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. The determination that Water-Short Year

Administration is in effect, pursuant to Subsection V.B.1.a., will become final for that year as of June 30.

2. Nebraska action in Water-Short Year Administration:
 - a. During Water-Short Year Administration, Nebraska will limit its Computed Beneficial Consumptive Use above Guide Rock to not more than Nebraska's Allocation that is derived from sources above Guide Rock, and Nebraska's share of any unused portion of Colorado's Allocation (no entitlement to Colorado's unused Allocation is implied or expressly granted by this provision). To accomplish this limitation, Nebraska may use one or more of the following measures:
 - i. supplementing water for Nebraska Bostwick Irrigation District by providing alternate supplies from below Guide Rock or from outside the Basin;
 - ii. adjusting well allocations for alluvial Wells above Guide Rock;
 - iii. adjusting multi-year well allocations for non-alluvial Wells above Guide Rock;
 - iv. reducing use of storage by Nebraska Bostwick Irrigation District above Guide Rock;
 - v. dry year leasing of water rights that divert at or above Guide Rock, or;
 - vi. any other measures that would help Nebraska limit Computed Beneficial Consumptive Use above Guide Rock to not more than that portion of Nebraska's allocation that is derived from sources above

Guide Rock and would (1) produce water above Harlan County Lake; (2) produce water below Harlan County Lake and above Guide Rock that can be diverted during the Bostwick irrigation season; or (3) produce water that can be stored and is needed to fill Lovewell Reservoir.

- b. Nebraska may offset any Computed Beneficial Consumptive Use in excess of its Allocation that is derived from sources above Guide Rock with Imported Water Supply Credit. If Nebraska chooses to exercise its option to offset with Imported Water Supply Credit, Nebraska will receive credit only for Imported Water Supply that: (1) produces water above Harlan County Lake; (2) produces water below Harlan County Lake and above Guide Rock that can be diverted during the Bostwick irrigation season; (3) produces water that can be stored and is needed to fill Lovewell Reservoir; or (4) Kansas and Nebraska will explore crediting water that is otherwise useable by Kansas.
- c. During Water-Short Year Administration, Nebraska will also limit its Computed Beneficial Consumptive Use in the Sub-basins to the sum of Nebraska's specific Sub-basin Allocations and 48.9% of the sum of the Unallocated Supply from those same Sub-basins.
- d. In years projected to be subject to Water-Short Year Administration, Nebraska will advise the other States and the United States no later than April 30 of measures Nebraska plans to take for that year and the anticipated water yield from those measures. In each Water-Short Year Administration year, Nebraska will advise the other States and the United States no later than June 30 of the measures it has taken or will take

for the year and the anticipated water yield from those measures.

- e. For purposes of determining Nebraska's compliance with Subsection V.B.2.:
 - i. Virgin Water Supply, Computed Water Supply, Allocations and Computed Beneficial Consumptive Use will be calculated on a two-year running average, as computed above Guide Rock, with any Water-Short Year Administration year treated as the second year of the two-year running average and using the prior year as the first year; or
 - ii. as an alternative, Nebraska may submit an Alternative Water-Short Year Administration Plan to the RRCA in accordance with the procedures set forth in Appendix M. The RRCA may modify Appendix M in any manner consistent with this Stipulation and the Compact.
- f. If, in the first year after Water-Short Year Administration is no longer in effect, the Compact accounting shows that Nebraska's Computed Beneficial Consumptive Use as calculated above Guide Rock in the previous year exceeded its annual Allocation above Guide Rock, and, for the current year, the expected or actual supply from Harlan County Lake, calculated pursuant to Subsection V.B.1.a., is greater than 119,000 Acre-feet but less than 130,000 Acre-feet, then Nebraska must either make up the entire amount of the previous year's Computed Beneficial Consumptive Use in excess of its Allocation, or the amount of the deficit needed to provide a projected supply in Harlan County Lake of at least 130,000 Acre-feet, whichever is less.

terracing on the water supply and water uses within the Basin, the States agree to undertake a study, in cooperation with the United States, of the impacts of Non-Federal Reservoirs and land terracing on the Virgin Water Supply.

1. The States, in cooperation with the United States, shall form a committee by January 31, 2003, to be known as the Conservation Committee. By April 30, 2004, the Conservation Committee will:
 - a. Evaluate the available methods and data relevant to studying the impacts of Non-Federal Reservoirs and land terracing practices on water supplies, including a review of any existing studies and their applicability to the Basin;
 - b. Determine the general types of data that are available and relevant to the study;
 - c. Determine the availability of data throughout the Basin, and assess the level of accuracy and precision of the data;
 - d. Agree on standards for data;
 - e. Identify additional data necessary to determine the quantitative effects of Non-Federal Reservoirs and land terracing practices on water supply;
 - f. Propose a methodology for assessing area-capacity relationships for Non-Federal Reservoirs; and
 - g. Submit to the RRCA a proposed study plan to determine the quantitative effects of Non-Federal Reservoirs and land terracing practices on water supplies, including whether such effects can be determined for each Designated Drainage Basin.
2. Following the RRCA's acceptance of the proposed study plan described in Subsection VI.B.1.g., the States and the

United States will undertake the study at a cost not to exceed one million dollars of which the United States will be responsible for 75% of the cost and each State will be responsible for one third of the remaining 25%. The States' portion may be provided entirely through in-kind contributions. If the cost of the study exceeds one million dollars, the United States will be responsible for the entire additional amount. The States, in cooperation with the United States, shall agree upon the timetable for the completion of such study, which shall be completed within five years of the date the proposed study plan is accepted by the RRCA.

3. Participation in the joint study does not commit any State or the RRCA to take any action or to include soil and water conservation measures in Compact accounting. Each State specifically reserves its position that it need not account for conservation measures as a Beneficial Consumptive Use under the Compact.
4. Participation in the joint study by the States or the United States is contingent upon the appropriation of funds by their respective State Legislatures and Congress. Participation by the States in this study is contingent upon participation and funding by the United States in accordance with this Subsection VI.B.

VII. Dispute Resolution

A. Initial Submission to the RRCA:

1. Any matter relating to Republican River Compact administration, including administration and enforcement of the Stipulation in which a State has an Actual Interest, shall first be Submitted to the RRCA. The United States and its agencies may attend all meetings of the RRCA. Proposed agendas, including any regular issue that may be raised, shall be distributed by the chairperson to all RRCA members at least 30 days in advance of any

regular meeting and as soon as possible prior to any special meeting.

2. Each member of the RRCA shall have one vote on each issue Submitted to the RRCA. RRCA action must be by unanimous vote. Action of the RRCA shall be by formal resolution or as reflected in the approved minutes. A request for formal resolution may be made by any member.
3. Any dispute that the State raising the issue for RRCA determination believes requires immediate resolution shall be designated as a “fast-track” issue. Any “fast-track” issue will be Addressed by the RRCA within 30 days of being Submitted to the RRCA unless otherwise agreed to by all States. Nothing in this Section shall prohibit the RRCA from Addressing a dispute prior to the expiration of the 30-day period.
4. Any dispute which the State raising the issue for RRCA determination believes does not require immediate resolution shall be designated as a “regular” issue. Any “regular” issue raised no later than 30 days prior to the next regularly scheduled meeting will be Addressed by the RRCA at that meeting.
5. The RRCA will hold regular meetings pursuant to its rules and regulations. Specially scheduled meetings to address any issue that is Submitted to the RRCA and designated as a “fast-track” issue or for any other emergency purposes shall be held if requested by any member. All members shall make a good faith effort to arrange a mutually agreeable date, time, and place for all meetings. A meeting may be conducted only when all members or their designees are available to attend. In the event a member requests a specially scheduled meeting to address a “fast-track” issue or for any other emergency purposes, such meeting shall be held as soon as reasonably possible, but in no event more than 30 days after the request is made unless more time is agreed to by

all members. If scheduling a meeting in person is not possible within 30 days of a request, the members may conduct a telephone conference or use other means available. If any such meeting is not held within thirty days because of the failure of any member other than the requesting member to attend or to agree to the date and place for the meeting, the State represented by the requesting member shall be relieved of any obligation to submit any dispute to the RRCA for potential consideration and resolution pursuant to the Stipulation.

6. Any issue Submitted to the RRCA by a State will include a specific definition of the issue, supporting materials and a designated schedule for resolution.
7. The RRCA will attempt to resolve any dispute submitted to the RRCA pursuant to this Section VII. If such a dispute cannot be resolved by the RRCA at the regular or special meeting at which the issue is addressed or within a schedule agreed to by all States, and the State raising the dispute desires to proceed, the dispute shall be submitted to non-binding arbitration unless otherwise agreed to by all States with an Actual Interest. The States involved in the dispute may agree that the arbitration shall be binding, but no State shall be subject to binding arbitration without its express written consent.

B. General Dispute Resolution Provisions:

1. Unless otherwise agreed to by all States, non-binding arbitration shall be initiated as follows: Any State, pursuant to Subsection VII.A.7., may invoke arbitration by providing written notice to the other States. A copy of any notice will be provided to the United States at the same time. Notice for the purposes of this Section shall include the time frame designation, a written description of the scope of the dispute, with sufficient detail to provide the States with an understanding of the substance of the dispute and all related issues, and sufficient information for the other States with an Actual Interest to

identify the technical skills that should be possessed by potential arbitrators necessary to resolve the dispute.

2. The arbitrator(s) shall be selected as follows: Upon receipt of notice of a dispute, the States shall confer within the deadlines set forth below to choose an arbitrator(s) and the States will in good faith attempt to agree on an arbitrator(s).
3. Any person submitted as a possible arbitrator by any State, or selected by CDR Associates or other such entity, shall not be an employee or agent of any State, shall be a person generally knowledgeable of the principles of the issues in the dispute, and shall disclose any actual or potential conflict of interest and all current or prior contractual and other relationships with any person or entity who could be directly affected by resolution of the dispute. Any person who has a contractual relationship with any State shall be automatically disqualified for conflict of interest unless the other States expressly agree in writing.
4. The arbitrator(s)' decision shall include a determination of the merits of the dispute and determination of a proposed remedy.
5. The arbitrator(s)' decision shall be provided to the States and the United States by facsimile and mail or comparable means.
6. Within 30 days of the issuance of the arbitrator's decision, the States that are parties to the dispute shall give written notice to the other States and the United States as to whether they will accept, accept and reject in part, or reject the arbitrator's decision.
7. No State shall object to admission of the arbitrator(s)' decision in any subsequent proceedings before the Court, but no State shall assert that the decision is conclusive on any issue. Further, no State shall call the arbitrator(s) as

a witness with regard to the dispute.

8. A State that has submitted a disputed issue to the RRCA and to arbitration as provided in this Section VII shall be deemed to have exhausted its administrative remedies with regard to such issue.

C. Fast Track Dispute Resolution Schedule:

1. Upon receipt of notice under Subsection VII.B.1., each State with an interest in the dispute will have ten business days to amend the scope of the dispute to address additional issues, unless all States agree to a longer schedule. If unforeseen issues are identified after the deadline for amending the scope of the dispute, they may be added upon agreement of all States or at the discretion of the arbitrator.
2. Within ten business days of receipt of the initial notice, each State shall submit the names of proposed arbitrators, including qualifications, to the other States. Within seven business days of receipt of the proposed names, the States will meet, in person or by telephone conference, and confer to agree on an arbitrator(s). If the States with an Actual Interest cannot agree on an arbitrator(s), the selection of the arbitrator will be submitted to CDR Associates, of Boulder, Colorado, or such other person or entity that may be agreed to by the RRCA. Every two years the RRCA will review the entity that will select an arbitrator(s), if the States cannot choose. The States will be bound by the selection of an arbitrator by CDR Associates or such other person or entity.
3. Upon selection of an arbitrator(s), the arbitrator(s) shall, within seven business days, hold an initial meeting/conference with the States, to set the schedule for submission and resolution of the pending dispute. The arbitrator shall set a schedule not to exceed six months unless the States agree otherwise. The States agree to provide all information, except privileged

information, requested by the arbitrator(s).

4. The arbitrator(s) shall issue a decision resolving the dispute within the shortest reasonable time, not to exceed 60 days from the date of final submission by the State parties.

D. Regular Dispute Resolution Schedule:

1. The States with an Actual Interest will agree upon the schedule for amending the scope of the dispute.
2. The States will agree upon the method and schedule for selecting an arbitrator(s).
3. The States and the arbitrator(s) will agree on a schedule for submission and resolution of the pending dispute.
4. The States will agree on a schedule for issuance of a decision by the arbitrator(s).

VIII. Non-Severability of Agreement

The agreement of the States to the terms of this Stipulation is based upon the inclusion of all of the terms hereof, and the rights and obligations set forth in this Stipulation are not severable. If for any reason, the Court should decline to approve this Stipulation in the form presented, the entire Stipulation shall be null and void and the terms of this Stipulation may not be used as evidence in any litigation between the States.

IX. Entirety of Agreement

This Stipulation and the Proposed Consent Judgment, together constitute the entire agreement among the parties hereto. No previous representations, inducements, promises or agreements, oral or otherwise, among the parties not contained in the documents identified in this paragraph or made in compliance with the requirements and obligations contained in the documents identified in this paragraph shall be of any force or effect. Nothing in this Section IX shall be construed as preventing the States from modifying the rules and regulations of the RRCA.

X. Retention of Jurisdiction by the Special Master

The Special Master shall retain jurisdiction until adoption of the RRCA Groundwater Model to:

- A. Select an arbitrator, if necessary, pursuant to Subsection IV.C.9.b.ii. - iv.; and
- B. Resolve disputes, not then subject to arbitration pursuant to Subsection IV.C.9., concerning the exchange and availability of data and information consistent with Subsection IV.C.4.

State Approvals of Final Settlement Stipulation
Kansas v. Nebraska & Colorado, No. 126, Original,
United States Supreme Court

The undersigned Governors and Attorneys General for the States of Kansas, Nebraska and Colorado, having authority to commit the States to a final settlement, hereby commit the States to the terms of this Final Settlement Stipulation reached by their respective Settlement Negotiation Teams. Approval of this Final Settlement Stipulation is conditioned upon the inclusion of all of the terms herein, and the rights and obligations set forth in this Final Settlement Stipulation are not severable. If for any reason, the Special Master or the United States Supreme Court should decline to approve this Stipulation in the form presented, the approvals of the undersigned Governors and Attorneys General for the States shall be null and void.



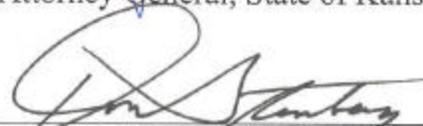
Governor, State of Kansas



Attorney General, State of Kansas



Governor, State of Nebraska



Attorney General, State of Nebraska



Governor, State of Colorado



Attorney General, State of Colorado