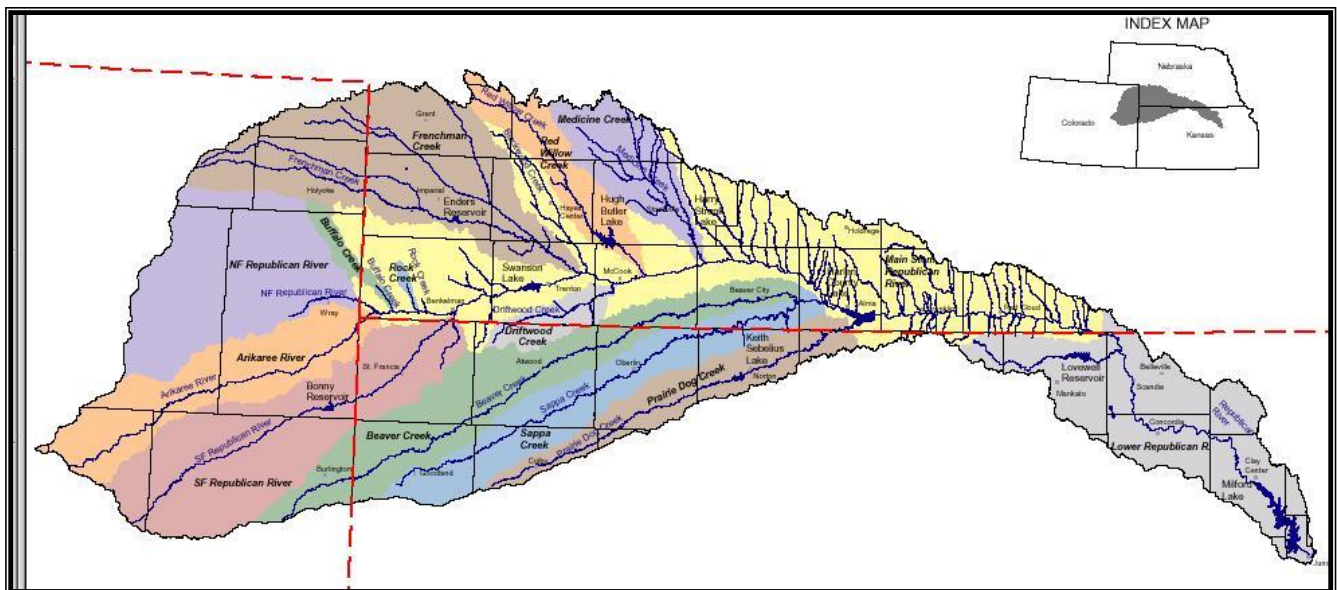


# REPUBLICAN RIVER COMPACT ADMINISTRATION 53<sup>rd</sup> ANNUAL REPORT

FOR THE YEAR 2013



LINCOLN, NEBRASKA

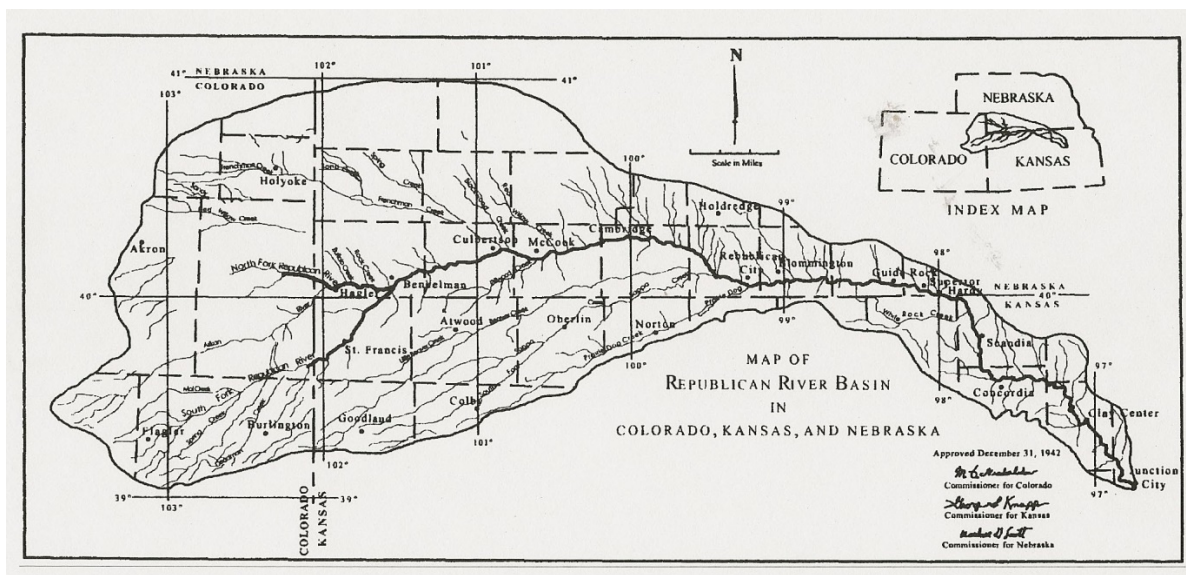
AUGUST 28, 2014

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# REPUBLICAN RIVER COMPACT ADMINISTRATION

Special Meeting  
December 19, 2013



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

DECEMBER 19, 2013

VIA TELEPHONE CONFERENCE  
CALL

**Summary & Minutes**

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

**Agenda Item 1: Introductions**

The Special Meeting of the Republican River Compact Administration (RRCA) was called to order by Nebraska Commissioner and Chairperson Brian Dunnigan at 2:00 p.m. December 19, 2013, via telephone conference call. Commissioner Dunnigan asked all attendees from the various listening locations to identify themselves. A complete list of those attendees is attached as Exhibit B. Some of the attendees included:

<u>Name</u>	<u>Representing</u>
Brian Dunnigan	Nebraska Commissioner and Chairperson
Jim Schneider	Nebraska Engineering Committee Member
Dick Wolfe	Colorado Commissioner
Ivan Franco	Colorado Engineering Committee Member
David Barfield	Kansas Commissioner
Chris Beightel	Kansas Engineering Committee Member

**Agenda Item 2: Adoption of the Agenda**

Commissioner Dunnigan introduced Agenda item 2. Commissioner Barfield moved to adopt the agenda which was last modified prior to this meeting by notice from Chairman Dunnigan. Motion was seconded by Commissioner Wolfe and it was unanimously approved. A copy of the amended agenda is attached as Exhibit C.

**Agenda Item 3: RRCA Groundwater Modeling Contract with Principia Mathematics**

Commissioner Dunnigan turned the meeting over to Jim Schneider who explained that the Engineering Committee Report was submitted to the RRCA commissioners. After two meetings it was decided to recommend that the RRCA continue its arrangement with Principia

Mathematica in the ongoing maintenance of the groundwater model and periodic updates requested by the Engineering Committee. Also recommended is the following two assignments: (1) Review the task descriptions in each state's contract with Principia Mathematica to ensure there is no latitude for Principia Mathematica to deviate from the standard procedures without prior approval by all three states; and (2) explore the development of an RFP to determine contractor options for the annual model update and model repository. A copy of the Engineering Committee Report is attached as Exhibit D.

Commissioner David Barfield reminded attendees that the need for the Engineering Committee to review the contract came about due to a conflict of interest with Principia Mathematica's principal, Dr. Schreuder, who also serves Colorado on some opposing issues with Kansas. In 2013 Dr. Schreuder submitted work, without Kansas' consent, to include changes to the modeling reflecting Colorado's position. Commissioner Barfield continued to share his concerns about the past contracts wherein Colorado's contract language for the scope of work was different than the contracts held by Nebraska and Kansas. In light of this, Kansas continues to be willing to contract with Principia Mathematica for 2014 as long as all three states' contracts have the same listing of tasks. Mr. Schneider reiterated that assignment number one in the Engineering report was there to address this concern. There were no other questions or comments and Commissioner Wolfe motioned to accept the Engineering Committee report. It was seconded by Commissioner Barfield and approved.

**Agenda Item 4: Resolution to approve temporary augmentation plan and related accounting procedures for the Colorado Compact Compliance Pipeline.**

Commissioner Wolfe directed attendees to the proposed resolution and exhibits submitted by Colorado for consideration. He also pointed out the latest addition of Condition 20 which reads, "The states further agree that if any changes to the RRCA accounting procedures or RRCA Groundwater Model, applicable to the Compact accounting for 2014 are mandated by any order or decree of the United States Supreme Court, such changes will be implemented in the Compact accounting for 2014." A copy of the resolution is attached as Exhibit E.

Commissioner Wolfe asked for discussion on Colorado's submittal. Commissioner Barfield sought clarification on the actual documents being considered and Chairperson Dunnigan reminded all that the resolution being considered was actually sent in an email by David Barfield on December 19<sup>th</sup>, and Condition 20 was added later. It was decided that the states would sign the clean version and not the red line version.

Commissioner Barfield went on to state that Kansas does not agree to use the April 13<sup>th</sup> Colorado CCP proposal for the long-term, and has suggested that the states consider a one-year agreement on CCP operations for the year 2014. Even though Kansas and Colorado have settled many of their concerns, Kansas believes the one-year agreement will allow Colorado to begin its CCP deliveries while the states gain experience with pipeline operations and provide time for long-term plans to be finalized and to address Kansas' South Fork concerns.

Commissioner Wolfe then desired to make some statements and expressed his gratitude to his staff and the Attorney General's office in Colorado for their efforts and feels the states are

experiencing an historic event in what has been accomplished thus far. He believes the experience gained from the operation of the Compact Compliance Pipeline is a unique one. He went on to thank the Republican River Water Conservation District, Mr. Slattery, local water users in the basin, and the Sandhills District for all their hard work. He thanked Commissioner Barfield for his consideration and suggestion of a temporary one-year approval in light of the many years of work and outstanding issues that still need resolution. He went on to say he believed that Colorado will demonstrate through this temporary approval its ability to operate this Compact Compliance Pipeline in a responsible manner along with the close coordination with the Republican River Water Conservation District. He stated Colorado will continue to pursue permanent approval of the Compact Compliance Pipeline, as well as Colorado's Bonny Resolution proposal.

Commissioner Wolfe moved to approve the resolution dated 12:30 p.m. Mountain Time with all the associated exhibits. Commissioner Barfield seconded the motion. Chairperson Dunnigan acknowledged the motion and the second and asked for discussion. Nothing further was stated from Kansas or Colorado. Chairperson Dunnigan then shared that Nebraska supports Colorado's Compact compliance efforts and therefore supported the resolution. However, he pointed out the temporary measure would not help to resolve outstanding issues that have already been thoroughly discussed between the states and stated the RRCA should be able to take action to provide long-term certainty to the water users in the basin. Dunnigan then asked for a vote and the motion was carried.

#### **Agenda Item 5: Future Meeting Arrangements**

The next meeting is scheduled for August 27<sup>th</sup> and 28<sup>th</sup>, in Lincoln. Arrangements will be made and passed on.

The meeting was adjourned by unanimous vote at 2:26 p.m. on December 19<sup>th</sup>, 2013.

The December 19, 2013, Special Meeting report is hereby approved by unanimous vote of the RRCA on this 24th day of August, 2016.

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

DATE SIGNED: \_\_\_\_\_

Dick Wolfe, Chairperson and Colorado Commissioner

DATE SIGNED: \_\_\_\_\_

Gordon W. Fassett, Nebraska Commissioner

DATE SIGNED: \_\_\_\_\_

David Barfield, Kansas Commissioner

**Exhibits**

- Exhibit A: Transcript of the December 19, 2013, Special Meeting
- Exhibit B: Attendance of the December 19, 2013, Special Meeting and Sign-In Sheets
- Exhibit C: Agenda for the December 19, 2013, Special Meeting
- Exhibit D: Engineering Committee Report for the December 19, 2013, Special Meeting
- Exhibit E: Resolution by the Republican River Compact Administration Approving a Temporary Augmentation Plan and Related Accounting Procedures for the Colorado Compact Compliance Pipeline, with Exhibits

# EXHIBIT A



SPECIAL MEETING OF THE  
REPUBLICAN RIVER COMPACT ADMINISTRATION

December 19, 2013  
2:00 p.m. Central Time  
Via Telephone  
Lincoln, Nebraska

MEMBERS PRESENT

IN NEBRASKA: Commissioner Brian Dunnigan, Chairperson  
Tom Riley  
Justin Lavene  
Jim Schneider  
Tom Wilmoth  
Jennifer Schellpeper  
David Kracman  
Dirk Dinnel  
John Thorburn  
Aaron Thompson  
Bill Peck  
Mike Delka

IN COLORADO: Commissioner Dick Wolfe  
Peter Ampe  
Dennis Montgomery  
Mike Sullivan  
Ivan Franco  
Willem Schreuder  
Scott Steinbrecher  
Dave Keeler  
Deb Daniel  
Dawn Webster  
Nate Midcap  
Brent Deterding

IN KANSAS: Commissioner David Barfield  
Chris Beightel  
Sam Perkins  
Chris Grunewald  
Chelsea Erickson  
Katherine Wilkins-Wells  
Kenny Nelson  
Pete Gile

---

GENERAL REPORTING SERVICE (402) 477-8425



1 PROCEEDINGS:

2 CHAIRPERSON DUNNIGAN: This is Brian Dunnigan. I  
3 am the current Chair of the Republican River Compact  
4 Administration, and this is a special meeting of the  
5 Republican River Compact.

6 First of all, I'd like to have you know that we  
7 have Wendy Cutting here as our court reporter in Lincoln.  
8 And I'm also going to go around to each of the states and  
9 have them introduce who's on the line at the various  
10 listening locations or call your listening locations out and  
11 have them introduce themselves. Please make sure that you  
12 do sign the sign-up sheets and get those to us and we'll  
13 make those part of the official record.

14 With me in Lincoln today are Tom Riley, Justin  
15 Lavene, Jim Schneider, Tom Wilmoth, Jennifer Schellpeper,  
16 and David Kracman.

17 I'll now go to the Nebraska listening stations and  
18 see if anybody's on the line at the Middle Republican  
19 Natural Resources District.

20 (No response.)

21 How about at the Lower Republican Natural  
22 Resources District?

23 (No response.)

24 At the Upper Republican Natural Resources  
25 District?

1 MR. DINNEL: Dirk Dinnel, Upper Republican NRD.

2 CHAIRPERSON DUNNIGAN: At the Tri-Basin Natural  
3 Resources District?

4 MR. THORBURN: John Thorburn here in Holdrege.

5 CHAIRPERSON DUNNIGAN: Thank you, John.

6 At the U.S. Bureau of Reclamation in McCook?

7 MR. THOMPSON: Good afternoon, Brian. We have  
8 Aaron Thompson and Bill Peck.

9 CHAIRPERSON DUNNIGAN: Thank you, Aaron.

10 At the Bostwick Irrigation District.

11 MR. DELKA: Good afternoon, Brian. Mike Delka.

12 CHAIRPERSON DUNNIGAN: Thank you, Mike.

13 With that, I will turn it over to Commissioner  
14 Wolfe in Colorado for introductions.

15 COMMISSIONER WOLFE: Thank you, Chairman. This is  
16 Dick Wolfe, Colorado Commissioner and State Engineer for  
17 Colorado. Besides myself here in Denver at the listening  
18 location is Ivan Franco, Engineer Advisor for Colorado; Mike  
19 Sullivan, Deputy State Engineer; Willem Schreuder with  
20 Principia Mathematica; and Scott Steinbrecher, Assistant  
21 Attorney General with the Colorado Attorney General's  
22 Office. And I think we may have Mr. Keeler, who has also  
23 joined in. I am not sure about the Republican Water  
24 Conservation District. They may have joined by now, but, if  
25 Mr. Keeler is there, he can identify himself and anybody

1 else who may be with him at his listening location.

2 MR. KEELER: This is just Dave Keeler. I'm here  
3 by myself. I'm with the Republican River with Colorado.

4 MR. AMPE: And this is Peter Ampe and Dennis  
5 Montgomery, counsel to the Republican River Water  
6 Conservation District.

7 MS. DANIEL: And this is Deb Daniel, General  
8 Manager of the Republican River Water Conservation District.  
9 With me is Dawn Webster and Nate Midcap. And may I also  
10 mention that Brent Deterding just walked in.

11 COMMISSIONER WOLFE: Thank you, Chairman, and I  
12 believe that is all that we anticipate that would be joining  
13 from Colorado at this point.

14 CHAIRPERSON DUNNIGAN: Thank you, Commissioner  
15 Wolfe.

16 Commissioner Barfield?

17 COMMISSIONER BARFIELD: Yes, Chairman Dunnigan,  
18 this is David Barfield, Chief Engineer and Commissioner for  
19 Kansas here in Topeka. I have with me, here in Topeka,  
20 Chris Beightel our Engineering Committee representative, and  
21 Sam Perkins. So, we'll go around -- and I believe on the  
22 phone, also, is Chris Grunewald, is that correct?

23 MR. GRUNEWALD: Yes, I'm here.

24 COMMISSIONER BARFIELD: Right, with the Attorney  
25 General's Office.

1           So, I'll go around the various listening stations  
2           in Kansas. First I'll go to Stockton. I wonder if you can  
3           identify who is there?

4           MS. ERICKSON: Yes, this is Chelsea Erickson.

5           COMMISSIONER BARFIELD: All right, is that it?

6           MS. ERICKSON: That's it for us.

7           COMMISSIONER BARFIELD: That's fine.

8           GMD 4 in Colby?

9           MS. WILKINS-WELLS: Katherine Wilkins-Wells, and  
10          so far we have no one else.

11          COMMISSIONER BARFIELD: Thank you very much. And  
12          I believe the Kansas Bostwick Irrigation District is  
13          listening in, is that correct?

14          MR. NELSON: This is Kenny Nelson and Pete Gile  
15          with Kansas Bostwick.

16          COMMISSIONER BARFIELD: Very good. I believe  
17          that's it. Anybody else on from Kansas?

18          (No response.)

19          Okay, I think that's it for Kansas.

20          CHAIRPERSON DUNNIGAN: Thank you, Commissioner  
21          Barfield.

22          And for the benefit of the court reporter, please  
23          make sure that you identify yourself when you speak as part  
24          of this telephone call -- conference call.

25          And with that, we'll move to Agenda Item 2, which

1 is the adoption of the agenda.

2 COMMISSIONER BARFIELD: I would move the adoption  
3 of the agenda as was, I believe, last modified yesterday by  
4 notice from you, Chairman Dunnigan, is that correct?

5 CHAIRPERSON DUNNIGAN: That's correct.

6 COMMISSIONER WOLFE: This is Chairman -- not  
7 Chairman, but Commissioner Wolfe, and I second that motion.

8 CHAIRPERSON DUNNIGAN: We have a motion and a  
9 second. Any other discussion?

10 (No response.)

11 Hearing none, all those in favor say aye.

12 CHAIRPERSON DUNNIGAN: Aye.

13 COMMISSIONER BARFIELD: Aye.

14 COMMISSIONER WOLFE: Aye.

15 CHAIRPERSON DUNNIGAN: The agenda is adopted.

16 Agenda Item 3 is the RRCA Groundwater Modeling  
17 Contract with Principia Mathematica, and I'll turn that over  
18 to Jim Schneider. Jim.

19 MR. SCHNEIDER: Thank you. The Engineering  
20 Committee Report was finalized and signed and submitted to  
21 the RRCA commissioners yesterday. We had two meetings, one  
22 at the end of October and one in November. I would note  
23 that one very minor clarification on the attachments.  
24 Attachment 2 is the notes from the November meeting, and  
25 we'll make that change to the attachment in the final

1 version that we put into the annual report.

2 The culmination of those meetings are contained in  
3 the recommendation in the report, which is that we recommend  
4 that the RRCA continue its arrangement with Principia  
5 Mathematica to perform the ongoing maintenance of the  
6 groundwater model and periodic updates requested by the  
7 Engineering Committee. We also recommend that it be given  
8 the following assignments: Number one, review the task  
9 descriptions in each state's contract with Principia  
10 Mathematica to ensure there is no latitude for Principia  
11 Mathematica to deviate from the standard procedures without  
12 prior approval by all three states. And number two, explore  
13 the development of an RFP to determine contractor options  
14 for the annual model update and model repository.

15 So, with that, I would be happy to answer any  
16 questions.

17 COMMISSIONER BARFIELD: Dave Barfield here for  
18 Kansas. I guess I don't have any questions, but I guess I  
19 would like to sort of provide a bit of a sort of statement  
20 of sort of where we are with respect to this issue then.  
21 Would that be all right?

22 MR. SCHNEIDER: Sure.

23 COMMISSIONER BARFIELD: Just for the record, this  
24 task of the Engineering Committee grew out of Kansas'  
25 concerns with the RRCA's arrangement with Principia



1       Mathematica, in light of the fact that its principal, Dr.  
2       Schreuder, serves as Colorado's technical expert and expert  
3       witness in litigation opposing Kansas, even when that  
4       litigation concerns the very substance of his work with the  
5       RRCA. This was exemplified in 2013, when Dr. Schreuder,  
6       without Kansas' consent, provided the states, as part of  
7       that work for the RRCA model run, which incorporated  
8       Colorado's Bonny proposals.

9               However, Kansas is willing to contract with  
10       Principia Mathematica for 2014 provided the states agree on  
11       a scope of work for Principia Mathematica to perform the  
12       annual model updates and associated tasks and that the scope  
13       of work provides, as you mentioned, no latitude to deviate  
14       from the standard procedures without prior approval of the  
15       three states.

16              You know, the states have agreed to this scope in  
17       the 2004. I passed on to the other commissioners just the  
18       record of that meeting of the RRCA where the administration  
19       agreed on the specific scope of work envisioned in this  
20       contract.

21              Since the Engineering Committee met in November,  
22       the contracts were exchanged, and it appears that the scope  
23       of services enumerated in that 2004 RRCA action are listed  
24       verbatim in Kansas' and Nebraska's contract language that we  
25       didn't find that in the language provided by Colorado. So,

1 we're willing to move forward, but before we can contract  
2 with Principia Mathematica, we'd like to see all three  
3 states have the same listing of tasks, which I believe was  
4 the intent of the RRCA's action in 2004 and really  
5 subsequently.

6 MR. SCHNEIDER: And that would be the recommended  
7 assignment No. 1.

8 COMMISSIONER BARFIELD: Correct.

9 CHAIRPERSON DUNNIGAN: Is there any other  
10 discussion?

11 (No response.)

12 Hearing none, I would entertain a motion to accept  
13 the Engineering Committee report.

14 COMMISSIONER WOLFE: So move. This is Dick Wolfe.

15 COMMISSIONER BARFIELD: I would second, David  
16 Barfield.

17 CHAIRPERSON DUNNIGAN: We have a motion and a  
18 second. Is there any further discussion?

19 (No response.)

20 Hearing none, all those in favor, signify by  
21 saying aye.

22 CHAIRPERSON DUNNIGAN: Aye.

23 COMMISSIONER WOLFE: Aye.

24 COMMISSIONER BARFIELD: Aye.

25 CHAIRPERSON DUNNIGAN: Opposed?

1 (No response.)

2 Motion carries.

3 Agenda Item 4. Resolution by the Republican River  
4 Compact Administration approving a temporary augmentation  
5 plan and related accounting procedures for the Colorado  
6 Compact Compliance Pipeline.

7 Commissioner Wolfe.

8 COMMISSIONER WOLFE: Thank you, Chairman Dunnigan.  
9 Each of the states should have before them now a package  
10 containing the proposed resolution submitted by Colorado for  
11 consideration today, with all the associated exhibits.  
12 There was one last suggested addition to the resolution that  
13 was circulated prior to today that I want to make sure is  
14 before everyone that I think everyone has had an opportunity  
15 to look at. And the version that I'm looking at that's  
16 dated 12:38 p.m. Mountain Time, is the addition of Condition  
17 20 to the resolution. I will just read that current version  
18 that I have on Condition No. 20 in addition to the other 19  
19 that have already been before the states that they already  
20 have considered and had an opportunity to look at. But that  
21 Condition No. 20 that is before us now for proposed addition  
22 to the resolution for consideration as the total package  
23 reads: "The states further agree that if any changes are  
24 mandated by any order or decree of the United States Supreme  
25 Court to Exhibits 2 and/or 4, such changes will be included

1 in the Compact accounting for 2014.”

2 Oh, I think it has been directed to me that we may  
3 have a more current version than that. I may have read an  
4 earlier version. Let me read what I believe to be the  
5 correct version 20 and then I'll entertain questions by the  
6 other two states if I have incorrectly identified that. But  
7 I think the correct version should read for Condition  
8 No. 20: “The states further agree that if any changes to  
9 the RRCA accounting procedures or RRCA Groundwater Model,  
10 model applicable to the Compact accounting for 2014 are  
11 mandated by any order or decree of the United States Supreme  
12 Court, such changes will be implemented in the Compact  
13 accounting for 2014.”

14 I apologize for that confusion, but I think what I  
15 just read, the current version of Condition No. 20 of that  
16 resolution. And before recommending a motion on that  
17 resolution and the associated appendices and exhibits, I  
18 would ask for -- if there are any questions or statements by  
19 Nebraska or Kansas as it relates to that condition and the  
20 resolution.

21 COMMISSIONER BARFIELD: Okay, well, this is David  
22 Barfield from Kansas. You know, I'd like to make a couple  
23 statements. First of all, just to be very clear for the  
24 record what we're approving, Mike Sullivan, on your behalf,  
25 Wednesday, December 18<sup>th</sup>, at -- in my email it's 5:32 p.m.,

1 I believe that's Central, sent the complete package which  
2 included the resolution, as well as all of the associated  
3 exhibits, and so we're essentially approving that package,  
4 except substituting a resolution that includes the  
5 additional Condition 20 that you just read into the record.  
6 That's what we're considering today, correct?

7 COMMISSIONER WOLFE: That is correct, and I  
8 appreciate that, Commissioner Barfield, for the explicit  
9 clarification on the package that was sent out by Mr.  
10 Sullivan on my behalf while I was out of the country, and  
11 what you describe does accurately represent what Colorado  
12 has submitted for consideration by the RRCA for today.

13 COMMISSIONER BARFIELD: Thank you. And then just  
14 a brief statement here. While Kansas does not agree to use  
15 the April 13<sup>th</sup> Colorado CCP proposal for the long-term,  
16 Kansas has suggested the states consider a one-year  
17 agreement on CCP operations for the year 2014. As reflected  
18 in Kansas-Colorado agreement this September, Kansas and  
19 Colorado have settled many aspects of our concerns with  
20 Colorado's CCP proposal and have narrowed the gap on other  
21 outstanding issues paving the way for this one-year  
22 agreement. Although Kansas does not believe the Colorado  
23 modeling method is appropriate -- the appropriate long-term  
24 approach, Kansas believes a one-year agreement will allow  
25 Colorado to begin its CCP deliveries and will allow the

1 states to gain valuable experience with pipeline operations  
2 over the coming months as we work to finalize a long-term  
3 CCP agreement on the final method for augmentation modeling  
4 and accounting, and to address Kansas' South Fork concerns.

5 Thank you, Mr. Wolfe.

6 CHAIRPERSON DUNNIGAN: This is Chairman Dunnigan  
7 and I just wanted to make clear for the record that the  
8 resolution that we're considering is from an email sent from  
9 David Barfield on December 19<sup>th</sup> at 1:38 p.m. And that would  
10 be as read on Condition 20, as read by Commissioner Wolfe.

11 COMMISSIONER WOLFE: That is correct, Chairman.

12 COMMISSIONER BARFIELD: This is Commissioner  
13 Barfield. That's correct. The resolution is contained in  
14 the email you just referenced. The attachment of all the  
15 exhibits that are also a part of the resolution were  
16 contained in Mr. Sullivan's email of last night. So, we  
17 need to put the two together to form the complete package  
18 that we're considering today.

19 COMMISSIONER WOLFE: That is correct. And what I  
20 would envision as well, if we act on this today, that the  
21 red line version that is dated 12:38 p.m. Mountain Time,  
22 1:38 p.m. Central Time, would be accepted and that version  
23 of that document would be the one then be circulated for  
24 signature by each of the three commissioners.

25 COMMISSIONER BARFIELD: This is Commissioner

1 Barfield. Wouldn't we -- I sent both the red line to show  
2 the changes from Mr. Steinbrecher's earlier suggestion, and  
3 I provided a clean version, as well, showing, I think,  
4 what's the final version we're considering. I think we  
5 would sign the clean version, would we not?

6 COMMISSIONER WOLFE: That's what I was referring  
7 to. That is correct. I apologize for any confusion there,  
8 but the intent is, is to sign the clean version and not the  
9 red line version.

10 COMMISSIONER BARFIELD: Great, thank you very  
11 much.

12 COMMISSIONER WOLFE: Thank you for that  
13 clarification.

14 There may be some questions or comments as well,  
15 but I'd like to also make some statements as well. I'd like  
16 to thank, particularly my staff and the Attorney General's  
17 Office here in Colorado for their efforts, not only this  
18 past year but the many years leading up to this. I think it  
19 is very, frankly, historic event that we're at this stage,  
20 even though it's a temporary approval that Colorado is  
21 seeking a one-year approval by the other states for this  
22 operation. I agree with Commissioner Barfield that I think  
23 it represents a unique moment for us, for Colorado and the  
24 other states, to gain experience from the operation of the  
25 Compact Compliance Pipeline. I want to thank the Republican

1 River Water Conservation District for all of the work  
2 they've done and their legal counsel and their consultant,  
3 as well, Mr. Slattery, to assist Colorado in its efforts to  
4 reach Compact compliance. And this is certainly one of the  
5 most major aspects of Colorado's overall efforts to reach  
6 Compact compliance. And we certainly could not have done it  
7 without their assistance, as well as the local water users  
8 in the basin. And particularly integral to that is the  
9 Sandhills District who has worked very closely with the  
10 Republican River Water Conservation District and the State  
11 of Colorado in terms of approving an export agreement to  
12 allow this water to be utilized in the Compact Compliance  
13 Pipeline.

14 Colorado remains committed to Compact compliance,  
15 and I want to thank Commissioner Barfield for your  
16 consideration and suggestion of a temporary one-year  
17 approval on that. We do appreciate that consideration in  
18 light of the many years that we've been working on this and  
19 recognize we still have work to do to resolve some  
20 outstanding issues. But we hope that -- we believe that  
21 Colorado will demonstrate through this temporary approval  
22 it's ability to operate this Compact Compliance Pipeline in  
23 a responsible manner. And, of course, this will be done  
24 with the close coordination with the Republican River Water  
25 Conservation District. We do, again, appreciate the



1 District's support and the unanimous support of this  
2 temporary operation. And Colorado will continue to  
3 diligently pursue permanent approval of the Compact  
4 Compliance Pipeline, as well as our Bonny resolution  
5 proposal that we have presented to the two states.

6 And with that, I certainly would entertain any  
7 questions you may have, but to initiate that, I would move  
8 that we approve the resolution that's dated 12:38 p.m.  
9 Mountain Time, with all the associated exhibits.

10 COMMISSIONER BARFIELD: This is Commissioner  
11 Barfield. I would second.

12 CHAIRPERSON DUNNIGAN: We have a motion and a  
13 second. Is there any further discussion from Kansas?

14 COMMISSIONER BARFIELD: Nothing further here.

15 CHAIRPERSON DUNNIGAN: From Colorado?

16 COMMISSIONER WOLFE: Nothing further from  
17 Colorado.

18 CHAIRPERSON DUNNIGAN: Nebraska supports  
19 Colorado's Compact compliance efforts and will, therefore,  
20 support this resolution. However, this temporary measure  
21 does nothing in the long term to resolve outstanding issues  
22 that have been thoroughly discussed between the states. The  
23 RRCA should be able to take meaningful action that provides  
24 long-term certainty to the water users in the basin.

25 With that, I'll take a vote. All those in favor

1 of the motion, signify by saying aye.

2 CHAIRPERSON DUNNIGAN: Aye.

3 COMMISSIONER WOLFE: Aye.

4 COMMISSIONER BARFIELD: Aye.

5 CHAIRPERSON DUNNIGAN: Opposed?

6 (No response.)

7 Motion carries.

8 Agenda Item 5 is future meeting arrangements.

9 Meeting is scheduled for August 27<sup>th</sup> and 28<sup>th</sup>. It will be in  
10 Lincoln, and we will make arrangements that we will make  
11 those available as we make those arrangements on a location.  
12 Any questions on that?

13 COMMISSIONER WOLFE: None from Colorado.

14 COMMISSIONER BARFIELD: None from Kansas.

15 CHAIRPERSON DUNNIGAN: With that, I would  
16 entertain a motion to adjourn the special meeting of the  
17 RRCA.

18 COMMISSIONER WOLFE: So move. This is  
19 Commissioner Wolfe.

20 COMMISSIONER BARFIELD: Commissioner Barfield, I  
21 would second.

22 CHAIRPERSON DUNNIGAN: Motion and a second, all  
23 those in favor?

24 Aye.

25 COMMISSIONER BARFIELD: Aye.

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COMMISSIONER WOLFE: Aye.

CHAIRPERSON DUNNIGAN: Opposed?

(No response.)

Meeting's adjourned. Thank you very much.

COMMISSIONER BARFIELD: Thank you.

COMMISSIONER WOLFE: Thank you all.

(Whereupon, at 2:26 p.m. on December 19, 2013, the proceedings were concluded.)

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# EXHIBIT B

**SPECIAL MEETING OF THE  
REPUBLICAN RIVER COMPACT ADMINISTRATION**  
December 19, 2013, via Telephone

**Attendance by Location**

Name	Representing
<b>Lincoln, Nebraska – Nebraska Department of Natural Resources Headquarters</b>	
Brian Dunnigan	Nebraska Commissioner
Jim Schneider	Nebraska Department of Natural Resources
Jennifer Schellpeper	Nebraska Department of Natural Resources
Justin Lavene	Nebraska Attorney General’s Office
Tim Wilmoth	Counsel for Nebraska
Tom Riley	Flatwater Group
David Kracman	Flatwater Group
<b>Imperial, Nebraska – Upper Republican Natural Resources District Office</b>	
Dirk Dinnel	Upper Republican Natural Resources District
<b>Holdrege, Nebraska – Tri-Basin Natural Resources District Office</b>	
John Thorburn	Tri-Basin Natural Resources District
<b>McCook Nebraska – United States Bureau of Reclamation Office</b>	
Aaron Thompson	Bureau of Reclamation
Bill Peck	Bureau of Reclamation
<b>Red Cloud, Nebraska – Nebraska Bostwick Irrigation District Office</b>	
Mike Delka	Nebraska Bostwick Irrigation District
<b>Denver, Colorado – Colorado Division of Water Resources Headquarters</b>	
Dick Wolfe	Colorado Commissioner
Ivan Franco	Colorado Division of Water Resources
Mike Sullivan	Colorado Division of Water Resources
Willem Schreüder	Principia Mathematica
Scott Steinbrecher	Colorado Attorney General’s Office
<b>Wray, Colorado – Republican River Water Conservation District</b>	
Deb Daniel	Republican River Water Conservation District
Dawn Webster	Republican River Water Conservation District
Brent Deterding	Republican River Water Conservation District
Nate Midcap	Frenchman Groundwater Management District, Central Yuma Groundwater Management District, Marks Butte Groundwater Management District, and Sandhills Groundwater Management District

**Unspecified Colorado Call-In Locations**

Dave Keeler	Colorado Division of Water Resources
Peter Ampe	Counsel for Republican River Water Conservation District
Dennis Montgomery	Counsel for Republican River Water Conservation District

**Topeka, Kansas – Kansas Division of Water Resources Headquarters**

David Barfield	Kansas Commissioner
Chris Beightel	Kansas Division of Water Resources
Sam Perkins	Kansas Division of Water Resources

**Topeka, Kansas – Kansas Attorney General’s Office**

Chris Grunewald	Kansas Attorney General’s Office
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**Stockton, Kansas – Kansas Division of Water Resources Field Office**

Chelsea Erickson	Kansas Division of Water Resources
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**Colby, Kansas – Groundwater Management District #4 Office**

Katherine Wilkins-Wells	Groundwater Management District #4
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**Courtland, Kansas – Kansas Bostwick Irrigation District Office**

Kenny Nelson	Kansas Bostwick Irrigation District
Pete Gile	Kansas Bostwick Irrigation District

Republican River Compact Administration – Special Meeting Attendance Sheet

December 19, 2013

Listening Location Denver

NAME – please print legibly	Affiliation/Group
Ivan Franco	C-DWR
Dick Wolfe	C-DWR
Mike Sullivan	C-DWR
William Schwid	Principal
Scott Steinbrecher	Colo. Atty Gen.

Republican River Compact Administration – Special Meeting Attendance Sheet

December 19, 2013

Listening Location Republican River Water Conservation District

NAME – please print legibly	Affiliation/Group
Dawn Webster	RRWCD
Deb Daniel	RRWCD
Nate Midcap	Manager Frenchman GWRD, Central Yuma GWRD, Marks Butte GWRD, Sandhills GWRD
Brent Deterding	RRWCD Board Member



# Republican River Compact Administration – Special Meeting Attendance Sheet

December 19, 2013

Listening Location     KDA, DWR, Topeka KS    

NAME – please print legibly	Affiliation/Group
CHRIS BEIGHTEL	KS DWR
SAM PERKINS	KS DWR
David Bardsul	KS DWR
CHRIS GRUNEWALD (other location)	KS Atty General

**Republican River Compact Administration – Special Meeting Attendance Sheet**

**December 19, 2013**

**Listening Location** Groundwater Management District No. 4, Colby, Kansas

NAME – please print legibly	Affiliation/Group
Katherine Wilkins-Wells - Manager	GMD 4 - Colby Kansas

# Republican River Compact Administration – Special Meeting Attendance Sheet

December 19, 2013

Listening Location Stockton Field Office

NAME – please print legibly	Affiliation/Group
Chelsea Erickson	DWR

**Republican River Compact Administration – Special Meeting Attendance Sheet**  
**December 19, 2013**

Listening Location \_\_\_\_\_

NAME – please print legibly	Affiliation/Group
<i>Kenneth Nelson</i>	<i>Kansas Bostwick Irr. Dist</i>
<i>Jared "Pete" Gile</i>	<i>  </i>

Republican River Compact Administration – Special Meeting Attendance Sheet  
 December 19, 2013

Listening Location Nebraska State Office Building

NAME – please print legibly	Affiliation/Group
Brian Quargis	DNR
Tom Riley	Flatwater
Justin Lavore	A60
Jim Schneider	DNR
Tom Wilmoth	BWS
Jennifer Shollpeper	DNR
David Krasman	Flatwater

**Republican River Compact Administration – Special Meeting Attendance Sheet**  
**December 19, 2013**

**Listening Location** Upper Republican Natural Resources District  
 511 East 5th Street  
 Imperial, NE

NAME – please print legibly	Affiliation/Group
DIRK DINNELL	Upper Republican NRD

# Republican River Compact Administration – Special Meeting Attendance Sheet December 19, 2013

Listening Location \_\_\_\_\_

NAME – please print legibly	Affiliation/Group
John Thorburn	Tri-Basin NRD

# Republican River Compact Administration – Special Meeting Attendance Sheet

December 19, 2013

Listening Location McCook, NE Reclamation Office

NAME – please print legibly	Affiliation/Group
Aaron Thompson	Reclamation
BILL PECK	Reclamation



**Republican River Compact Administration – Special Meeting Attendance Sheet**  
**December 19, 2013**

Listening Location \_\_\_\_\_

NAME – please print legibly	Affiliation/Group
Mike DeKa	Bostwick I.D.

# EXHIBIT C

**AGENDA FOR  
SPECIAL MEETING OF THE  
REPUBLICAN RIVER COMPACT ADMINISTRATION**  
December 19, 2013, 2:00 PM Central, 1:00 PM Mountain  
Via Telephone

1. Introductions
2. Adoption of the Agenda
3. RRCA Groundwater Modeling Contract with Principia Mathematica
4. Resolution by the Republican River Compact Administration Approving a Temporary Augmentation Plan and Related Accounting Procedures for the Colorado Compact Compliance Pipeline
5. Future Meeting Arrangements
6. Adjournment

# EXHIBIT D

## Engineering Committee Report

### Republican River Compact Administration Special Meeting

December 19, 2013

#### Committee Assignment

Review the contract for Principia Mathematica to perform on-going maintenance of the ground water model and periodic updates requested by the Engineering Committee for calendar year 2013. Complete this review by December 15, 2013.

#### Related Work Activities

The EC met on October 28<sup>th</sup> and November 22<sup>nd</sup> to discuss the committee assignments. Meeting notes are included as attachments 1 and 2.

#### Recommendation

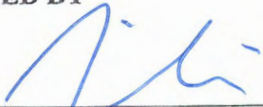
The Engineering Committee recommends that the RRCA continue its arrangement with Principia Mathematica to perform on-going maintenance of the ground water model and periodic updates requested by the Engineering Committee. However, the Engineering Committee recommends that it be given the following assignments:

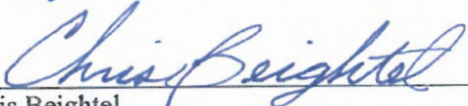
1. Review the task descriptions in each states contract with Principia Mathematica to ensure that there is no latitude for Principia Mathematica to deviate from the standard procedures without prior approval by all three states.
2. Explore the development of an RFP to determine contractor options for the annual model update and model repository.

The Engineering Committee Report will be posted on the web at:

[www.republicanrivercompact.org](http://www.republicanrivercompact.org).

#### SIGNED BY

  
James Schneider  
Chair, Engineering Committee Member for Nebraska

  
Chris Beightel  
Engineering Committee Member for Kansas

  
Ivan Franco  
Engineering Committee Member for Colorado

## **Engineering Committee Report**

### **Republican River Compact Administration Special Meeting**

December 19, 2013

#### **Committee Assignment**

Review the contract for Principia Mathematica to perform on-going maintenance of the ground water model and periodic updates requested by the Engineering Committee for calendar year 2013. Complete this review by December 15, 2013.

#### **Related Work Activities**

The EC met on October 28<sup>th</sup> and November 22<sup>nd</sup> to discuss the committee assignments. Meeting notes are included as attachments 1 and 2.

#### **Recommendation**

The Engineering Committee recommends that the RRCA continue its arrangement with Principia Mathematica to perform on-going maintenance of the ground water model and periodic updates requested by the Engineering Committee. However, the Engineering Committee recommends that it be given the following assignments:

1. Review the task descriptions in each states contract with Principia Mathematica to ensure that there is no latitude for Principia Mathematica to deviate from the standard procedures without prior approval by all three states.
2. Explore the development of an RFP to determine contractor options for the annual model update and model repository.

The Engineering Committee Report will be posted on the web at:

[www.republicanrivercompact.org](http://www.republicanrivercompact.org).

#### **SIGNED BY**

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James Schneider  
Chair, Engineering Committee Member for Nebraska

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Chris Beightel  
Engineering Committee Member for Kansas

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Ivan Franco  
Engineering Committee Member for Colorado

Notes from the October Meeting of the RRCA Engineering Committee  
 Drafted 10/30/2013  
 Kansas edits 11/08/2013  
 Nebraska edits 11/15/2013

## Attendees:

Chris Beightel	Kansas	Ivan Franco	Colorado
Chelsea Erickson	Kansas	Jim Schneider	Nebraska
Sam Perkins	Kansas	Jennifer Schellpeper	Nebraska
Craig Scott	Reclamation	David Kracman	Nebraska
Scott Guenther	Reclamation	Tom Riley	Nebraska
		Willem Schreuder	Principia Mathematica

- 1 Introductions
- 2 Review / Modify Agenda
  - Schneider proposed adding an item: Beaver Creek Stream Gage
- 3 Publication of RRCA Annual Reports
  - **Kansas is taking the lead, will distribute to President of US and federal agencies, and each Party**
  - **Each Party will distribute to their Governor and Basin Stakeholders**
  - **The format will be electronic**
- 4 Modeling and Data Tasks for Principia Mathematica
  - Schneider emphasized that a centralized repository and the experience with the project are two factors of high importance to Nebraska
  - Franco noted that Colorado agrees with Nebraska
  - Beightel summarized Kansas' proposal (attachment A), noting that there is a potential for conflict of interest with the current procedures because Colorado's expert witness in litigation between Kansas, Colorado, and Nebraska is being paid to perform model updates and to generate model runs for the RRCA
  - Beightel noted that
    - The ability of each state to run the model authoritatively and the ability of the States to come to agreement on a model run in the absence of Principia Mathematica was important to Kansas
    - Kansas feels strongly that any contract for model update work done on behalf of the RRCA should be with a neutral party
    - Kansas' concern was illustrated when Principia modeled Bonny Reservoir according to Colorado's proposal which the RRCA has not approved
  - Schneider stated that Nebraska is not comfortable rotating modeling duties among the 3 states and has concerns about cost and time involved with transitioning to a new consultant
  - **Nebraska will schedule another meeting in 3-4 weeks for the EC to meet and discuss only this agenda item**

## Notes from the October Meeting of the RRCA Engineering Committee

Drafted 10/30/2013

Kansas edits 11/08/2013

Nebraska edits 11/15/2013

- 5 Conservation Committee Terraces Study
  - Scott Guenther summarized status
  - **Reclamation will follow-up with Derrel Martin to address his comments, do final edits and distribute a final draft to the EC**
  - **Reclamation will also follow-up on the question of where the data will be housed**
  
- 6 Data Exchange for 2013 Accounting
  - No Discussion expected until April
  
- 7 Estimating Ground and Surface Water Irrigation Recharge and Return Flows
  - Beightel noted Kansas' perception that irrigation practices across the Basin have changed to generally become more efficient, asks if the other States are interested in participating in a study
  - **Kansas will provide a draft "Scope and Need" document to the EC regarding changes in irrigation efficiency through time**
  - Schneider pointed out Column 3 of Attachment 7 to the RRCA Accounting Procedures and asked if the Parties had any recollection on the reason this column has not historically been used
  - Schneider noted that Nebraska has installed new flumes on several surface water returns/spills and believes that Column 3 is intended to contain that data
  - Craig Scott noted that the BOR reports on the data given to them by the producers, so if they do not receive the data it would not be reported
  - Schneider noted that NDNR had granted a convey water permit involving Meeker-Driftwood and Bartley canals and believes that Column 3 of the accounting sheet should be used to properly account for this activity and other canal wasteways
  - Further discussion on Column 3 of Attachment 7 is tabled until the next meeting
  
- 8 Accounting Issues 2006-2012
  - **Before the next meeting each Party will make a list of any items in this category that are not already in arbitration and send them to the group**
  
- 9 Accounting Changes for Nebraska Groundwater Recharge Projects waiting for results of the Basin Study
  - Discussion needed on how to deal with non-irrigation season evaporation from canals
  
- 10 Future Augmentation Plans - Application and Approval Process
  - Discussion will wait until current arbitration is complete
  - Schneider noted that the TBNRD may be developing a new project



Notes from the October Meeting of the RRCA Engineering Committee

Drafted 10/30/2013

Kansas edits 11/08/2013

Nebraska edits 11/15/2013

- 11 Harlan County Lake - Evaporation Charges and Compact Accounting Adjustments
  - Schneider summarized this year's agreement
  - Craig Scott noted that the 2013 proportioning of evaporation is consistent with historic Reclamation practice
  - Beightel described Kansas' proposal to calculate HCL evaporation in such cases
  - **Kansas will develop a proposal for calculating the incremental increase in reservoir area and assignment of evaporation and send it to the EC**
  
- 12 Budget to Accomplish Compact Goals
  - **Nebraska will send examples of the Blue River and North Platte Decree Committee budgets**
  - **Kansas will send examples of the Arkansas River Budgets with Colorado and Oklahoma**
  - **Colorado will send other example budgets**
  - The committee discussed funding such things as stream gages, studies, web/cloud storage of data, court reporters, and other meeting costs
  
- 13 Beaver Creek Stream Gage
  - Schneider explained that the Beaver Creek Stream Gage is in disrepair and will be moved to a near-by bridge
  - Schneider offered tours of the new location
  - **Nebraska will send a map showing the current and proposed gage locations**
  
- 14 Summary of Meeting Actions / Assignments
  - Schneider summarized the action items from the agenda
  
- 15 Future Meeting Schedule
  - **Nebraska will send out potential dates to hold an EC meeting in a few weeks**
  
  - The next regularly scheduled meeting is in January

Kansas Proposal for Performing the Annual Update of the  
RRCA Groundwater Model  
Submitted to the RRCA Engineering Committee  
October 23, 2013

1. Documentation of the Groundwater Model update process:

The RRCA has approved an official version of the Groundwater Model (V12s2) and a version of the Accounting Procedures (August 12, 2010). However, the RRCA has not adopted a process for ensuring that the RRCA Groundwater Model is run in accordance with the Accounting Procedures.

The RRCA shall document the process by which the Groundwater Model is used to implement the Accounting Procedures. The documentation shall be sufficiently detailed so that a reasonably qualified person who may not be deeply familiar with the specifics of the RRCA Groundwater Model and Accounting Procedures could nonetheless follow the process and generate the correct output. This documentation, when agreed upon by the states, shall be made a part of the RRCA Accounting Procedures as Attachment [X].

2. Responsibility and workflow for performing the annual Groundwater Model update:

The state that is chairing the RRCA ("host state") shall be responsible to provide to the other states a complete model run for the previous calendar year by April 30. The update shall use the data which is to be exchanged between the states by April 15 of each year pursuant Section V. of the RRCA Accounting Procedures. This shall be called the preliminary run of the model<sup>1</sup>. The other states shall submit to the host state and to one another any comments or suggested alterations to the preliminary run by May 15.

The states shall exchange their final data for the previous year at least 60 days prior to the annual meeting. The host state shall then submit to the other states a run of the model using the final data within 15 days of the states' exchange of their final data. This shall be called the draft final run of the model. The other states shall submit to the host state and to one another any comments or suggested alterations to the draft final run within 15 days of the submission of the draft final run of the model. When the states agree to a final model run, it will be written to DVD and distributed to the states by the host state.

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<sup>1</sup> A run of the model will be an archive (e.g. \*.zip) electronic file that includes the current version of the RRCA Groundwater Model, all necessary computer programs, input files, and output files needed to run the RRCA Groundwater Model and report the impacts, and an MD5 checksum to verify the identity of the archive file that contains the model run.

Kansas Proposal for Performing the Annual Update of the  
RRCA Groundwater Model  
Submitted to the RRCA Engineering Committee  
October 23, 2013

3. Repository and disposition of annual model runs:

Option 1: Each state shall maintain an electronic repository of final runs of the model. The repository shall be available to the other states through one or more common means (e.g., HTTP, FTP).

Option 2: The States will contract with a neutral third party to host a website that will serve as the repository for the foregoing.

Option 3: The States will contract with a neutral third party to perform some of the data compilation tasks required to prepare a model run (e.g. precipitation, reservoir stage level, and evapotranspiration data) and said contractor will also provide the website to serve as repository for the foregoing model runs.

Notes from the November Meeting of the RRCA Engineering Committee  
Drafted 11/26/2013  
Corrected 12/19/2013

## Attendees:

Chris Beightel	Kansas	Ivan Franco	Colorado
Chelsea Erickson	Kansas	Jim Schneider	Nebraska
Sam Perkins	Kansas	Jennifer Schellpeper	Nebraska

- 1 Introductions
- 2 Review / Modify Agenda
  - Beightel proposed adding discussion on the budget at the end if there was time.
- 3 Review October Meeting Notes
  - No further comments were supplied. Comments are to be provided before finalization of the EC report for the December 19<sup>th</sup> RRCA meeting.
- 4 Modeling and Data Tasks for Principia Mathematica
  - Schneider summarized two potential ways to move forward in the immediate future: The RRCA signs one contract with Willem either using an outside entity such as the Nebraska Community Foundation, like the NPDC does or as an entity like the Blue River Compact OR the RRCA could investigate hiring a new 3<sup>rd</sup> party using an RFP process.
  - Beightel stated that KS is willing to begin the work on the RFP process. He also summarized his review of the current KS contract with Principia, and noted that the language is clear that Principia has no latitude to make judgment calls on how to complete the annual model runs.
  - Schneider and Franco agreed that the intent of each state's contracts are the same.
  - Schneider noted that there is little use in obtaining an official run from Principia while there are any disputed issues that affect the model run.
  - **It was agreed that Principia should continue work on the current calendar year, though the EC should review all three state's contracts with Principia to ensure that there is no latitude for Principia Mathematica to deviate from the standard procedures without prior approval by all three states. At the same time the EC will work to develop an RFP for a 3<sup>rd</sup> party contractor and continue to evaluate the costs and benefits of a new contractor.**
  - **Everyone agreed to circulate a copy of their current contract with Principia to the other members of the EC.**
  - **The EC drafted a report to the RRCA; this will be routed along with the meeting notes for review and comment.**
  - **Nebraska will research how the EC report becomes available on the website:**  
<http://www.republicanrivercompact.org/>
- 5 Budget
  - Discussion on the CO email occurred with agreement that further discussion would occur during the January meeting, with everyone following up on the action items in the October meeting minutes.
- 6 Summary of Meeting Actions / Assignments
  - Schneider summarized the action items from the agenda.
  - **Nebraska will include an Outlook mail invitation in future EC meeting emails.**
- 7 Future Meeting Schedule
  - The next regularly scheduled meeting is in January

# EXHIBIT E

RESOLUTION BY THE REPUBLICAN RIVER COMPACT ADMINISTRATION  
APPROVING A TEMPORARY AUGMENTATION PLAN AND RELATED ACCOUNTING  
PROCEDURES FOR THE COLORADO COMPACT COMPLIANCE PIPELINE

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

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

**Whereas**, the State of Colorado’s Computed Beneficial Consumptive Use of the waters of the Republican River Basin exceeded Colorado’s Compact Allocation using the five-year running average to determine Compact compliance from 2003 through 2012, as provided in Subsection IV.D of the FSS;

**Whereas**, the Republican River Water Conservation District is a water conservation district created by Colorado statute to assist the State of Colorado to comply with the Compact;

**Whereas**, the Republican River Water Conservation District, acting by and through its Water Activity Enterprise (“RRWCD WAE”), has acquired fifteen wells (“Compact Compliance Wells”) in the Republican River Basin in Colorado and has constructed collector pipelines, a storage tank, a main transmission pipeline, and an outlet structure capable of delivering groundwater to the North Fork of the Republican River for the sole purpose of offsetting stream depletions in order to comply with the State of Colorado’s Compact Allocations;

**Whereas**, the RRWCD WAE has purchased groundwater rights in the Republican River Basin within Colorado and proposes to pump the historical consumptive use of some or all of these groundwater rights from the Compact Compliance Wells into the pipeline it has constructed and deliver that water into the North Fork of the Republican River near the Colorado/Nebraska State Line to offset stream depletions in order to comply with Colorado’s Compact Allocations (the “Colorado Compact Compliance Pipeline” or the “Pipeline”);

**Whereas**, the States of Kansas, Nebraska, and Colorado adopted a Moratorium on New Wells in Subsection III.A of the FSS, with certain exceptions set forth in subsection III.B of the FSS;

**Whereas**, Subsection III.B.1.k of the FSS provides that the Moratorium shall not apply to 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;

**Whereas**, Subsection III.B.1.k of the FSS further provides that augmentation plans and related accounting procedures submitted under this Subsection III.B.1.k shall be approved by the Republican River Compact Administration (“RRCA”) prior to implementation;

**Whereas**, Subsection I.F of the FSS also provides that: “The RRCA may modify the RRCA Accounting Procedures, or any portion thereof, in any manner consistent with the Compact and this Stipulation;” and

**Whereas**, the State of Colorado and the RRWCD WAE submitted an application for approval of an augmentation plan and related accounting procedures for the Pipeline to account for water delivered to the North Fork of the Republican River for the purpose of offsetting stream depletions in order to comply with Colorado’s Compact Allocations;

**Whereas**, the States have agreed to a one-year agreement to operate the Pipeline on certain terms, which are described below; and

**Whereas**, because of the short-term nature of the temporary augmentation plan, the States have agreed to approve the temporary augmentation plan using the procedures described below instead of adopting revised RRCA Accounting Procedures and Reporting Requirements.

**Now, therefore**, it is hereby resolved that the RRCA approves a temporary augmentation plan and the related accounting procedures for the Colorado Compact Compliance Pipeline subject to the terms and conditions set forth herein. The Colorado Compact Compliance Pipeline project is described in the revised application submitted by the State of Colorado and the RRWCD WAE, which is attached hereto as Exhibit 1. The augmentation plan for the Pipeline and the terms and conditions for the operation of the augmentation plan are described below. The related changes to the accounting procedures and groundwater model are included in the revised RRCA Accounting Procedures and Reporting Requirements (“revised RRCA Accounting Procedures”), which are attached hereto as Exhibit 2, and “Modeling the Colorado Compliance Pipeline in the RRCA Groundwater Model”, which is attached hereto as Exhibit 4. The Compact accounting for 2014 will follow the terms and conditions described in this resolution and its exhibits. This temporary approval of the augmentation plan and the related changes to the accounting procedures and groundwater model for the Pipeline is subject to the following terms and conditions:

1. The average annual historical consumptive use of the groundwater rights that will be diverted at the Compact Compliance Wells shall be the amounts determined by the Colorado Ground Water Commission pursuant to its rules and regulations, as shown on Exhibit 3.
2. Diversions from any individual Compact Compliance Well shall not exceed 2,500 acre-feet during 2014.

3. Diversions during any calendar year under the groundwater rights listed on Exhibit 3 and any additional groundwater rights approved for diversion through the Compact Compliance Wells pursuant to paragraph 11 shall not exceed the total average annual historical consumptive use of the rights, except that banking of groundwater shall be permitted in accordance with the rules and regulations of the Colorado Ground Water Commission, subject to the terms and conditions of this resolution..
4. Diversions from the Compact Compliance Wells shall be measured by totalizing flow meters in compliance with the Colorado State Engineer's rules and regulations for the measurement of groundwater diversions in the Republican River basin, and the measured groundwater pumping from such wells shall be included in the "base" run of the RRCA Groundwater Model in accordance with paragraph III.D.1 of the revised RRCA Accounting Procedures. Net depletions from the Colorado Compact Compliance Wells shall be computed by the RRCA Groundwater Model and included in Colorado's Computed Beneficial Consumptive Use of groundwater pursuant to paragraph III.D.1 of the revised RRCA Accounting Procedures (See Exhibit 2; also Exhibit 4).
5. Deliveries from the Colorado Compact Compliance Pipeline to the North Fork of the Republican River shall be measured by a Parshall flume or other measuring device located at the outlet structure. Authorized representatives of Kansas and Nebraska shall have the right to inspect the Parshall flume and other measurement devices for the Pipeline at any reasonable time upon notice to the RRWCD WAE.
6. The measured deliveries from the Colorado Compact Compliance Pipeline during 2014, to the extent they are in compliance with this resolution, shall offset stream depletions to the North Fork of the Republican River sub-basin on an acre-foot for acre-foot basis in accordance with the revised RRCA Accounting Procedures.
7. The measured deliveries from the Colorado Compact Compliance Pipeline during 2014 shall be added to the RRCA Groundwater Model in all model runs described in the revised RRCA Accounting Procedures (See Exhibit 2; also Exhibit 4). For the purpose of operating this temporary augmentation plan during 2014, the "base" run, the "no NE import" run, and the "no State pumping" run referred to in paragraph III.A.3. (Imported Water Supply Credit Calculation) and paragraph III.D.1. (Groundwater CBCU) of the RRCA Accounting Procedures and the RRCA Groundwater Model will be modified to include the "outflow of the CCP" as described in Exhibit 4.
8. Colorado shall determine the Projected Augmentation Water Supply Delivery ("Projected Delivery") for 2014 to estimate the volume of augmentation water that will be delivered from the Pipeline during 2014 as provided below, and the RRWCD WAE shall make deliveries from the Pipeline as provided below:



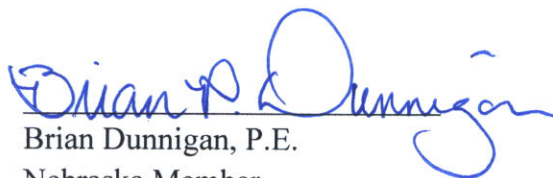
- A. Colorado will initially estimate the Projected Delivery required for 2014 based on the largest stream depletions to the North Fork of the Republican River sub-basin during the previous five years without Pipeline deliveries. The RRWCD WAE will begin deliveries from the Colorado Compact Compliance Pipeline during 2014 based on the Projected Delivery and shall make a minimum delivery of 4,000 acre-feet per year as provided below.
- B. Accounting for deliveries will start January 1.
- C. The RRWCD WAE will begin deliveries from the Pipeline on or after January 1 and will make the minimum annual delivery of 4,000 acre-feet during the months of January, February, and March, unless such deliveries cannot be made due to operational conditions beyond the control of the RRWCD WAE. If the minimum annual delivery of 4,000 acre-feet cannot be made during the months of January, February and March due to such operational conditions, Colorado will consult with Nebraska and Kansas to schedule such deliveries later in the year.
- D. Colorado will calculate and provide notice to the Kansas and Nebraska RRCA Members, by April 1, of the Projected Delivery as provided in paragraph 8.A of this resolution. Unless Colorado determines by April 1 that it will not be able to deliver additional required augmentation water in October through December, Colorado shall stop deliveries at the end of March. If Colorado anticipates that deliveries in the months of November and December will not be sufficient to replace stream depletions to the North Fork of the Republican River for Compact compliance, Colorado will maximize deliveries first in January, then sequentially in the months of February, March, and April. Deliveries will be made in May only if there is reason to believe that additional deliveries in the months of October through December will not be sufficient to replace stream depletions to the North Fork of the Republican River for Compact compliance.
- E. Because the final accounting for determining Compact compliance is not done until after the compact year is completed and because Colorado's allocations and computed beneficial consumptive use are dependent upon such factors as runoff, the amount of pumping, precipitation and crop evapotranspiration, Colorado cannot know the precise amount of augmentation water that will be needed in 2014. After the initial minimum delivery of 4,000 acre-feet, Colorado will collect preliminary data for Compact accounting for 2014 and, no later than September 1, 2014, will update the Projected Delivery required for the remainder of 2014, less the initial minimum delivery of the 4,000 acre-feet that has already been delivered; provided that for 2014, the RRWCD WAE may limit deliveries to the updated Projected Delivery for 2014 or the updated Projected Delivery for 2014

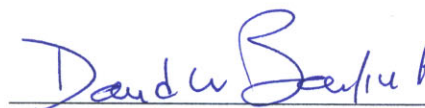
plus a percentage of the deficit owed from the previous 4 years; but not to exceed the average annual historical consumptive use of the groundwater rights as shown on Exhibit 3.

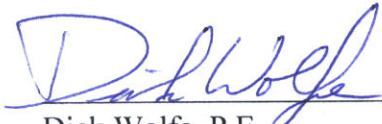
- F. After updating the Projected Delivery, as described above, if additional deliveries in excess of the initial delivery of 4,000 acre-feet are necessary to offset projected stream depletions to the North Fork of the Republican River, Colorado and the RRWCD WAE will maximize such additional deliveries first in the month of December, then November and October of 2014. If the total necessary additional deliveries cannot be made within those three months, Colorado will attempt to schedule those deliveries in April and May of 2014, or at such time so as to avoid, to the extent practicable, deliveries during the subject accounting year's irrigation season.
  - G. Colorado's shortage and Projected Delivery will be calculated in accordance with the FSS.
9. The as-built design for the Colorado Compact Compliance Pipeline, including the location of the Compact Compliance Wells and the river outlet structure, is described in the revised application attached hereto as Exhibit 1. No future changes to the Pipeline that would materially change the location of the Compact Compliance Wells or the river outlet structure shall be made without prior approval of the RRCA.
  10. Augmentation credit for deliveries from the Pipeline to the North Fork of the Republican River shall be limited to offsetting stream depletions to the North Fork of the Republican River Colorado sub-basin for the purpose of determining Colorado's compliance with the sub-basin non-impairment requirement (Table 4A) and for calculating Colorado's five-year running average allocation and computed beneficial use for determining Compact compliance (Table 3A).
  11. The approval of this augmentation plan and the related accounting procedures for the Pipeline shall not govern the approval of any future proposed augmentation plan and related accounting procedures submitted by the State of Colorado or any other State under Subsection III.B.1.k of the FSS.
  12. The approval of this augmentation plan and the related accounting procedures for the Pipeline shall not waive any State's rights to seek damages from any other State for violations of the Compact or the FSS subsequent to December 15, 2002.
  13. Except for the approval of the augmentation plan and the related accounting procedures as provided herein, nothing in this Resolution shall relieve the State of Colorado from complying with the obligations set forth in the Compact or FSS.

14. Unless otherwise agreed to by States, operation of the augmentation plan and its related accounting and modeling will automatically cease at 12:00 AM on January 1, 2015.
15. Colorado agrees to collect data related to pumping of Pipeline wells and delivery of water through the outfall structure of the Pipeline on at least a daily basis and provide such data to Kansas and Nebraska on a monthly basis; and by January 30, 2014, will provide all spreadsheets and calculations related to the initial "Projected Delivery" of augmentation water as described in Exhibit 1. Colorado will provide to Kansas all updates to that projection within one week of the completion of any update.
16. The States agree that this one-year agreement does not obligate any State to support or approve any augmentation plan, including the CCP, at any time in the future.
17. The States agree that this one-year operation of the augmentation plan will not be considered precedent for the RRCA's approval of the CCP or any other augmentation proposal in the future, including a different version of the CCP if one should be submitted for consideration by the RRCA.
18. Kansas does not agree to implementation of the Bonny Reservoir Accounting Proposal.
19. The States do not waive any objections, positions, or arguments related to the CCP, augmentation plans or their approval under the FSS, or the Bonny Reservoir Accounting Proposal.
20. The States further agree that if any changes to the RRCA accounting procedures or RRCA groundwater model applicable to the compact accounting for 2014 are mandated by any order or decree of the United States Supreme Court, such changes will be implemented in the Compact Accounting for 2014.

Approved by the RRCA this 19th day of December, 2013.

 1/13/2014  
Brian Dunnigan, P.E. date  
Nebraska Member  
Chairman, RRCA

 2/11/2014  
David Barfield, P.E. date  
Kansas Member

  
\_\_\_\_\_  
Dick Wolfe, P.E.  
Colorado Member

12-19-13  
\_\_\_\_\_  
date

**REVISED APPLICATION FOR APPROVAL OF AN  
AUGMENTATION PLAN AND RELATED ACCOUNTING  
PROCEDURES UNDER SUBSECTION III.B.I.K. OF THE FINAL  
SETTLEMENT STIPULATION IN KANSAS V. NEBRASKA AND  
COLORADO, NO. 126, ORIGINAL**

**For**

**The Colorado  
Compact Compliance Pipeline**

**Submitted by**

**The State of Colorado  
And  
The Republican River Water Conservation District, acting by and  
through its Water Activity Enterprise**

**April 5, 2013**

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## **1.0 INTRODUCTION**

In March 2008, the State of Colorado submitted an application to the Republican River Compact Administration (RRCA) requesting approval of an augmentation plan and revisions to the RRCA Accounting Procedures pursuant to Subsection III.B.1.k of the Final Settlement Stipulation (FSS) for a pipeline project to deliver groundwater to the North Fork of the Republican River (the “Colorado CCP” or “CCP”). The purpose of the project was to offset stream depletions so that Colorado can comply with its Compact Allocations.

In 2009, Colorado submitted two resolutions to the RRCA to approve an augmentation plan and proposed revisions to the RRCA Accounting Procedures. The RRCA did not approve the resolution, and Colorado then invoked non-binding arbitration pursuant to the FSS to resolve the dispute. An arbitrator was selected, and Colorado resolved Nebraska’s concerns with the CCP prior to the arbitration hearing.

On October 7, 2010, Arbitrator Martha Pagel issued a Final Decision on the Colorado CCP Dispute which addressed deficiencies that Kansas had raised concerning the Colorado CCP. The Arbitrator concluded that Kansas had not unreasonably withheld its consent to the CCP proposal; however, the Arbitrator concluded that with certain clarifications and revisions she recommended in the Decision, the CCP proposal would provide a reasonable and necessary approach for meeting Colorado’s Compact obligations that should be approved by the RRCA.

This revised application for approval of an augmentation plan and related accounting procedures for the Colorado CCP is based on the agreement between Colorado and Nebraska, the Arbitrator’s Final Decision, and subsequent discussions with Kansas.

### **1.1. The Republican River Compact and the Final Settlement Stipulation in *Kansas v. Nebraska and Colorado***

Colorado, Kansas, and Nebraska entered into the Republican River Compact (Compact), which became operative in 1943, to allocate the waters of the Republican River Basin. The Compact allocates water for beneficial consumptive use to each State derived from the computed average annual virgin water supply for designated drainage basins (sub-basins).

In 1959, pursuant to Article IX of the Compact, the RRCA was formed to administer the Compact. Each State appoints one member to the RRCA, but the RRCA requires unanimity to take any action.

Following the formation of the RRCA, the States debated whether the Compact included ground water in the water supply allocated for beneficial consumptive use. The States were unable to resolve this dispute, and in 1997 Kansas filed a motion with the U.S. Supreme Court for leave to file a bill of complaint against Nebraska claiming that Nebraska was violating the Compact by permitting excessive pumping of groundwater. In January 1999, the U.S. Supreme Court granted Kansas' motion. Although Kansas made no claims against Colorado in its initial complaint, Colorado was named a party to the suit because it is a signatory to the Compact.

A special master was appointed, and settlement negotiations resulted in a Final Settlement Stipulation (FSS). In the FSS, the States agreed to (1) dismissal of all claims against each other with respect to activities or conditions occurring before December 15, 2002; (2) a moratorium on the construction of all new wells in the basin upstream of Guide Rock, Nebraska, with certain exceptions listed in the FSS; (3) the development of a groundwater model to determine stream flow depletions caused by well pumping and the credit for water imported into the basin; (4) revised accounting procedures to determine Compact compliance; and (5) a procedure to resolve disputes relating to Compact administration. The U.S. Supreme Court approved the FSS in 2003.

### **1.2. Subsection III.B.1.k of the FSS**

Subsection III.B.1.k of the FSS provides that the moratorium on the construction of new wells in the basin upstream of Guide Rock, Nebraska, does not apply to wells acquired or constructed for the purpose of offsetting stream depletions in order to comply with a State's Compact Allocations. Subsection III.B.1.k includes a proviso that such wells "shall not cause any new net depletion to stream flow either annually or long-term." It further states:

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.

### **1.3. The Republican River Water Conservation District**

In 2004, the Republican River Water Conservation District ("RRWCD" or "District") was created to assist Colorado in complying with Compact. The RRWCD is located in northeastern Colorado and includes all of Yuma and Phillips Counties and

those portions of Kit Carson, Lincoln, Logan, Sedgwick, and Washington Counties that overlie the Ogallala aquifer. Figure 2 is a map showing the boundaries of the RRWCD and local groundwater management districts, as well as the approximate location of the pipeline. Currently, with the exception of approximately 200 acres irrigated by surface water, virtually all the irrigated acreage in the RRWCD is irrigated with groundwater from the Ogallala aquifer.

The RRWCD established a water activity enterprise (the RRWCD WAE) as authorized by Colorado statute and imposed a water use fee on the diversion of water in the District to raise revenues to assist Colorado in complying with the Compact. The RRWCD WAE has used revenues from use fees to retire approximately 48,000 acres that were historically irrigated with groundwater in the District. In addition, revenues have been used to purchase and lease surface water rights in the District to reduce beneficial consumptive use in Colorado by approximately 3,000 acre-feet per year.

#### **1.4. The Ground Water Rights for the CCP and the Compact Compliance Wells**

In 2009, the RRWCD WAE purchased groundwater rights that will be diverted for the CCP. These ground water rights are located north of the North Fork of the Republican River in Colorado and have an aggregate historical consumptive use of approximately 13,000 acre-feet per year. The RRWCD WAE also acquired easements for fifteen well sites, collector pipelines, a storage tank, and a main transmission pipeline, and acquired a parcel of land for an outlet structure on the North Fork of the Republican River for the CCP. In 2012, construction of the CCP was completed.

The groundwater rights acquired by the RRWCD WAE for the CCP were historically used for irrigation in the Republican River Basin in Colorado. The RRWCD WAE applied to change the use of these groundwater rights and to consolidate them at eight existing wells (Compact Compliance Wells) to be used to pump groundwater from the Ogallala aquifer to the North Fork of the Republican River. An additional seven existing wells will be alternate points of diversion that can be brought into production in the future as needed. The location of the CCP, including the Compact Compliance Wells, is shown in Figure 4.

The historical consumptive use of the groundwater rights that will be diverted at the Compact Compliance Wells is discussed in Section 2.1.1.

The 15 Compact Compliance Wells have a pumping capacity between 1,500 to 1,800 gallons per minute per well. New motors, pumps and a valve vault with control and measurement valves have been installed at each well. PVC collector pipelines connect the wells to a 140,000 gallon storage tank. Water will be delivered from the storage tank to the North Fork of the Republican River by gravity through 12 miles of 42" to 30" diameter pipe at rates up to 40 cfs. At the outlet structure near the river, water will be discharged through a multiple-orifice valve located in a partially buried concrete outlet structure, which dissipates the pressure head before the water is discharged into a rip-rap lined outlet channel and then enters the river.

Surge control and flow measurement have been provided at the outlet structure, along with a measurement flume located in the outlet channel. The CCP is initially capable of delivering 15,000 acre-feet per year. However, the capacity of the CCP can be increased to 25,000 acre-feet per year in the future if additional wells are connected to the system and additional groundwater rights are acquired.

#### **1.5. The Arbitrator's Final Decision**

In the Final Decision, the Arbitrator concluded that Kansas had not unreasonably withheld its consent to the CCP proposal with respect to five of the factual issues. At a minimum, the Arbitrator concluded that the CCP proposal was deficient in its current form because it did not adequately incorporate into a single, integrated proposal all of the operational details and limits Colorado had described and relied upon at the trial. However, the Arbitrator concluded that with certain clarifications and revisions recommended in the Decision, the CCP proposal "represents an appropriate and necessary augmentation plan that should be approved by the RRCA." (Colorado Compact Compliance Pipeline Dispute, Arbitrator's Final Decision (October 7, 2010) at 4)

Following the Arbitrator's Final Decision, Colorado and Kansas have conducted additional discussions in an effort to resolve Kansas' concerns regarding the Colorado CCP. This revised application incorporates the operational details and limits Colorado described and relied upon at the 2010 arbitration trial, as well as modifications based on the Arbitrator's Final Decision and subsequent discussions with Kansas.

#### **1.6. Project Sponsor of the Colorado CCP – The Republican River Water Conservation District, acting by and through its Water Activity Enterprise**

The RRWCD encompasses approximately 7,761 square miles or about 7.5% of Colorado's 104,247 square miles. A map of the RRWCD boundaries is shown in Figure

2. The RRWCD is managed and controlled by a 15-member board of directors comprised of one member appointed by the county commissioners of each of the seven counties wholly or partially within the RRWCD, one member appointed by the boards of the seven ground water management districts within the RRWCD, and one member appointed by the Colorado Ground Water Commission (“CGWC”).

The RRWCD Board of Directors has imposed use fees on the diversion of water within the District. In 2008, the use fee on the diversion of water for irrigation use was increased to \$14.50 per assessed irrigated acre to pay for the Colorado CCP. There are approximately 500,500 assessed irrigated acres within the RRWCD subject to the use fee, and use fees generate approximately \$7.3 million per year to repay the CWCB loan for the Colorado CCP and for other expenses.

The RRWCD WAE uses a portion of the revenues collected from use fees to purchase and/or lease surface water rights to reduce Colorado’s beneficial consumptive use and to provide local cost-sharing for federal programs designed to retire irrigated acreage in the basin, including the Republican River Conservation Reserve Enhancement Program (CREP) and the Environmental Quality Improvement Program (EQIP). To date, approximately 48,000 irrigated acres have been voluntarily retired in the basin under CREP and EQIP, or approximately ten percent (10%) of the irrigated acreage in the basin. RRWCD WAE has submitted to the US. Department of Agriculture for its approval an amendment to the Republican River CREP designed to retire an additional 30,000 irrigated acres. The RRWCD WAE has committed to provide local cost-sharing for the amendment. CREP is an important part of the RRWCD’s efforts to implement conservation measures in the basin to reduce ground water pumping in Colorado to assist in meeting Colorado’s compact obligations. However, reduction of ground water pumping in Colorado alone is not sufficient for Colorado to comply with its Compact obligations. Therefore, the RRWCD has constructed the Colorado CCP.

## **2.0 PROPOSED AUGMENTATION PLAN AND RELATED ACCOUNTING PROCEDURES**

### **2.1. Groundwater Water Rights Acquired for the CCP**

#### **2.1.1. The Historical Consumptive Use of the Groundwater Rights**

A change of use and a change of well location of ground water rights permitted under the Colorado Ground Water Management Act requires approval of the CGWC.

The procedures for changing the use of existing rights to designated ground water based on historical consumptive use are established in the CGWC's rules and regulations.

In 2008, the RRWCD WAE applied to the CGWC to change the use of the ground water rights acquired for the CCP and to consolidate them at fifteen existing wells (Compact Compliance Wells) to be used to offset stream depletions in order to comply with Colorado's Compact Allocations, with provision for limited use to revegetate the lands historically irrigated by the ground water rights. Initially, only eight of the wells will be used to pump ground water for the Colorado CCP, and seven wells will serve as backup if additional well capacity is needed. The locations of the 15 wells are shown in Figure 4 (wells A2 through A8, and B5 are the initial wells; wells numbered A1 and B1 through 4, B6, and B7 are the backup wells).

The lands historically irrigated by the ground water rights for the CCP are shown in Figure 3. The average annual historical consumptive use was determined for the period 1998-2007 from historical cropping records, pumping estimated from power consumption records and a power coefficient that converts the kilowatt-hours to acre-feet pumped, irrigated acreage, and climate records. The crop irrigation requirement was determined using the same procedures used in the RRCA Accounting Procedures.

Nebraska and Kansas previously reviewed the average annual historical consumptive use calculations for the groundwater rights to be used in the CCP. Nebraska provided comments and Colorado revised the average annual historical consumptive use amounts based on Nebraska's comments. The Colorado Division of Water Resources also provided comments, resulting in additional changes to average annual historical consumptive use amounts. The Compact Compliance Wells will cause no new net depletions because pumping will be limited to the historical consumptive use of the existing rights.

The final average annual historical consumptive use amounts of the groundwater rights that were acquired for the CCP have now been determined by the CGWC pursuant to its rules and regulations, which are shown in Table 1. The CGWC's rules and regulations limit withdrawals under the groundwater rights that were acquired for the CCP to the historical consumptive use of the groundwater rights, subject to banking provisions in the rules. Colorado has incorporated these limits and the provision for banking in the proposed resolution.



In areas where a ground water management district (GWMD) has been formed, the board of directors of the GWMD can prohibit the use of ground water outside the boundaries of the GWMD. All but one of the ground water rights acquired for the CCP are located within the Sandhills GWMD, and the RRWCD WAE filed an application with the Sandhills GWMD for approval to export ground water from the Sandhills GWMD, and the Sandhills GWMD has approved the export, subject to terms and conditions contained in its order. A copy of the order is attached as Appendix A.

One ground water right acquired by the RRWCD WAE for the CCP is located in the Central Yuma GWMD, but the RRWCD WAE has not requested approval of the Central Yuma GWMD for export at this time and this right is not included in the proposed augmentation plan at this time.

2.1.2. Additional Terms and Conditions on Pumping from the Compact Compliance Wells

The Colorado State Engineer has adopted rules and regulations for the Republican River Basin in Colorado that require measurement of ground water withdrawals. Totalizing flow meters have been installed on the Compact Compliance Wells in compliance with the State Engineer's rules and regulations, and pumping from the Compact Compliance Wells will be measured in accordance with those rules and regulations and will be provided to the Division of Water Resources for inclusion in the RRCA Groundwater Model in accordance with Subsection III.B.1.k of the FSS. Terms and conditions requiring measurement of withdrawals by totalizing flow meters and including the pumping in the RRCA Groundwater Model are incorporated into the proposed resolution to approve the augmentation plan and revised RRCA Accounting Procedures for the CCP.

As a term and condition of the change of the groundwater rights to the Compact Compliance Wells, the RRWCD WAE agreed that diversions from any individual Compact Compliance Well shall be limited to no more than 2,500 acre-feet per year. This limit was included here and in the proposed resolution to address concerns that the future drawdowns under the CCP operations might be significantly different than the historical drawdowns.

Colorado proposes that banking of ground water be permitted in accordance with the CGWC's rules and regulations; however, the banking reserve would not override the provisions for calculating the Projected Delivery or the minimum annual delivery of 4,000 acre-feet in the proposed resolution. Under the CGWC's rules and regulations,

the RRWCD WAE can be authorized to use a three-year banking reserve, which would allow the RRWCD WAE to initiate a banking reserve for consumptive use water that is not pumped, subject to limits in the CGWC's rules and regulations. The amount of water in the banking reserve is then available for withdrawals in future years, but the banking reserve is limited to an amount equal to three times the difference between the maximum annual permitted appropriation and the average annual historical withdrawal.

For the CCP groundwater rights, the banking reserve would be limited to 30,996 acre-feet (23,391 ac-ft – 13,059 ac-ft x 3), but the amount that could be withdrawn in any year is limited to the maximum annual appropriation of 23,391 acre-feet per year. However, the physical limitations of the pipeline and wells itself provide for a maximum ability to divert 25,000 acre-feet per year. Further, while that much could be theoretically withdrawn from the banking reserve in any year, Colorado agrees that the Augmentation Water Supply Credit will be limited as set forth in paragraph 3 of the resolution.

## **2.2. Proposed Augmentation Plan and Related Accounting Procedures**

Groundwater pumped by the Compact Compliance Wells will be delivered through collector pipelines to a storage tank and then by a main pipeline to the North Fork of the Republican River a short distance upstream from the streamflow gage at the Colorado-Nebraska state line (USGS gaging station number 06823000, North Fork Republican River at the Colorado-Nebraska State Line). The locations of the Compact Compliance Wells, the collector pipelines, and the main pipeline are shown in Figure 4.

Colorado's proposed revisions to the RRCA Accounting Procedures for the CCP provide that the discharges from the CCP will be measured at the outfall structure and subtracted from the gaged flow of the North Fork of the Republican River to calculate the Augmentation Water Supply Credit to the North Fork of the Republican River in Colorado. The proposed revisions to the RRCA Accounting Procedures further provide that the amount of the discharge to the North Fork of the Republican River from the CCP will be the Augmentation Water Supply Credit for the purpose of offsetting stream depletions to the North Fork of the Republican River to comply with Colorado's Compact Allocations.

## **2.3. Operation of the Compact Compliance Pipeline**

Based on the delivery schedule agreed to with Nebraska and discussions with Kansas, the CCP will be operated as follows:

1. Accounting for deliveries will start January 1 of each year.
2. Colorado will begin deliveries on January 1 and will make a minimum annual delivery of 4,000 acre-feet during the months of January through March.
3. Colorado will calculate and provide notice to the Kansas and Nebraska RRCA Members by April 1, of the Projected Delivery as provided in the Colorado resolution. Unless Colorado determines by April 1 that it will not be able to deliver additional required augmentation water in October through December, Colorado shall stop deliveries at the end of March. If Colorado anticipates that deliveries in the months of November and December will not be sufficient for Compact compliance, Colorado will maximize deliveries first in January, then sequentially in the months of February, March, and April. Deliveries will be made in May only if there is reason to believe that additional deliveries in the months of October through December will not be sufficient for Compact compliance.
4. No later than September 1<sup>st</sup>, Colorado will gather provisional hydrologic data for the months of January through August of the same year and will estimate the amount of deliveries needed for Compact compliance for the remainder of the year after accounting for the deliveries earlier in the year. Colorado will then maximize any additional water deliveries first in the month of December, then sequentially in November, and October.

Because the final accounting for determining Compact compliance is not done until after the compact year is completed and because Colorado's allocations and computed beneficial consumptive use are dependent upon such factors as runoff, the amount of pumping, precipitation, and crop evapotranspiration, Colorado cannot know the precise amount of augmentation water that will be needed in any given year. However, because Compact accounting is done on a five-year running average, Colorado will know the accounting for the previous four years and will know whether there is a deficit in the prior four years that will need to be made up in the coming year in addition to the delivery required for the coming year.

Colorado has agreed to make a minimum annual delivery of 4,000 acre-feet from the CCP and, assuming there is no deficit to be made up, will deliver the 4,000 acre-feet in January, February, and March. Colorado will then collect preliminary data for Compact accounting for the current year and, by no later than September 1, will update the projected delivery required for the remainder of the year. If additional deliveries are required, Colorado will then schedule them in October, November, and December. If there is a deficit to be made up, Colorado will determine if additional deliveries need to be made in April or May in addition to deliveries that will be made in October, November, and December. In the first years of operation, Colorado will have a large deficit; however, deliveries are limited by the historical consumptive use of the groundwater rights for the CCP. Thus, the maximum amount of water that Colorado

could deliver in the first four years of operation of the CCP is approximately 13,000 acre-feet per year, or a maximum of 52,000 over the four year period. Even assuming these deliveries resulted in Colorado having no deficit at the beginning of the fifth year, Colorado would still be obligated to deliver a minimum of 4,000 acre-feet in the fifth year. By September 1, most of the irrigation pumping during the year is completed and preliminary data are available for the portion of the year that is most critical in determining beneficial consumptive use. Thus, no later than September 1, Colorado can update the earlier Projected Delivery and produce a better estimate of the Projected Delivery that will be required for the year, and this method of operating the CCP and the minimum delivery of 4,000 acre-feet per year are intended to avoid large over or under deliveries in any given year. The provision for a minimum delivery of 4,000 acre-feet per year is also designed to address concerns that Colorado would make large over-deliveries in wet years and no deliveries in dry years.

As with the operation of any facility of this size, operational and structural problems could prevent the CCP from operating in the precise manner described above, but Colorado has agreed to consult with Nebraska prior to December 31<sup>st</sup> of the year preceding the scheduled deliveries and Colorado and the RRWCD WAE together have agreed to consult with Nebraska as needed to coordinate the timing and volume of deliveries to the North Fork of the Republican River.

#### **2.4. Proposed Revisions to the RRCA Accounting Procedures and Terms and Conditions for Operation of the CCP**

Colorado's proposed revisions to the RRCA Accounting Procedures are attached to the proposed RRCA resolution. For the CCP, Colorado proposes that the Computed Beneficial Consumptive Use of the Compact Compliance Wells, specifically the ground water impacts of these wells upon the stream system, will be determined by use of the RRCA Groundwater Model as the difference in streamflows using two runs of the model, as specified Section III.D.1 of the RRCA Accounting Procedures and Reporting Requirements. Terms and conditions on pumping from the Compact Compliance Wells are discussed in Sections 2.1.1 and 2.1.2.

The ground water pumped by the Compact Compliance Wells will be delivered to a storage tank by collector pipelines and then delivered by the main transmission pipeline to the North Fork of the Republican River through an outfall structure located a short distance upstream from the streamflow gage at the Colorado-Nebraska state line (USGS gaging station number 06823000, North Fork Republican River at the Colorado-

Nebraska State Line). Discharges from the Colorado CCP will be measured by a Parshall flume at the outlet structure.

Colorado's proposed revisions to the RRCA Accounting Procedures provide that these discharges will be subtracted from the gaged flow of the North Fork of the Republican River to calculate the Annual Virgin Water Supply and that the discharges to the North Fork of the Republican River from the Colorado CCP will be credited against depletions in the North Fork sub-basin for purposes of demonstrating sub-basin compliance with Compact Allocations. Likewise, Colorado's proposed revisions to the RRCA Accounting Procedures provide that these discharges will be the Augmentation Credit for the purpose of offsetting stream depletions to comply with the State of Colorado's Compact Allocations and shall be counted as a credit/offset against the Computed Beneficial Consumptive use of water allocated to Colorado.

### **3.0 NEED FOR THE CCP**

Although the RRCA has not approved the final accounting for all of these years, the approximate amount that Colorado exceeded its Compact allocations for the years 2003-2008 is shown in Figure 5. Figure 6 shows the components of Colorado's average annual computed beneficial consumptive use for the years 2003-2007. As shown in Figure 6, stream depletions from groundwater pumping are the largest component of Colorado's average annual computed beneficial consumptive use.

Figure 7 shows a projection of the annual amounts Colorado's statewide Compact allocation is exceeded for two scenarios, with current pumping and eliminating all pumping. As shown in the graph, Colorado's computed beneficial consumptive use exceeds Colorado's Statewide Compact allocations 25 years in the future even when all pumping is eliminated.

Figure 8 shows how Colorado can achieve Compact compliance with the CCP. In addition to the CCP deliveries, Figure 8 shows the effect of other actions Colorado and the RRWCD WAE have or could take to assist with Compact compliance. The projection of the amounts Colorado's Compact allocation is exceeded with current pumping is the same as shown on Figure 7. The annual bars on Figure 8 show the effects of 1) the elimination of beneficial consumptive use from irrigation with surface water rights, 2) draining Bonny Reservoir to eliminate the beneficial consumptive use resulting from evaporation of water stored in the reservoir and seepage losses to the Ogallala Aquifer, and 3) the operation of the CCP. Colorado can achieve Compact

compliance under the projection made for this scenario with the combination of actions shown in Figure 8. However, as shown in Figure 7, Colorado cannot achieve Compact compliance in the next 25 years without the CCP, absent a dramatic change in the hydrology of the basin in Colorado.

The State of Colorado exceeded its compact allocation by approximately 11,000 ac-ft/yr for period of 2003-2007. In order to comply with Colorado's Compact Allocations, the RRWCD WAE has purchased ground water rights that were historically used for irrigation in the Republican River Basin in Colorado and has constructed the Colorado CCP to deliver ground water pumped under these rights to the North Fork of the Republican River through an outlet structure located a short distance upstream from the Colorado-Kansas State line. This is the stream gage location where the Virgin Water Supply of the North Fork and Colorado stream depletions on the North Fork are calculated under the RRCA Accounting Procedures.

The Compact Compliance Wells are located in the area of the Ogallala Aquifer in Colorado that has the greatest saturated thickness. The wells typically have 250 to 300 feet of saturated thickness. The well field is also located in the sand hills region of Colorado, which has the highest recharge rates of any location in the Republican River Basin in Colorado. The location of the Compact Compliance Wells was selected to ensure a long-term water supply as water levels decline.

#### **4.0 CLARIFICATIONS AND REVISIONS TO ADDRESS THE ARBITRATOR'S 2010 FINAL DECISION**

During the 2010 arbitration, Kansas raised eight deficiencies in the Colorado CCP proposal ("Colorado's Proposal"), which were addressed by the Arbitrator in the Final Decision. The objections were: (1) the augmentation water to be delivered to the North Fork of the Republican River was not included in the RRCA ("Republican River Compact Administration") Groundwater Model; (2) the Colorado Proposal did not address Colorado's failure to meet the sub-basin non-impairment requirement in the South Fork sub-basin; (3) the limitations set forth in the Colorado Resolution were insufficient to require augmentation deliveries on a reliable basis and left those deliveries to Colorado's discretion; (4) the Colorado Proposal lacked "temporal limits"; (5) the States had not conducted a detailed review of Colorado's proposed changes to the RRCA Accounting Procedures; (6) Colorado's "catch-up" provisions were inadequate; (7) Colorado had not explained the reasons for adding language to the Resolution that would allow future augmentation deliveries to increase to 25,000 acre-

feet per year; and (8) Colorado and Nebraska had refused to disclose the terms of their stipulated agreement.

The following sections respond to the Arbitrator's rulings.

## **5.0 Responses to Kansas' Objections Noted in Arbitrator's Final Decision**

### **5.1. Kansas' Objection Number 1: The Colorado Proposal Did Not Include the Augmentation Water in the RRCA Groundwater Model**

Kansas' first objection to Colorado's Proposal was that the augmentation water to be delivered to the North Fork of the Republican River was not included in the RRCA Groundwater Model.

The States were in agreement that pumping from the Compact Compliance Wells would be included in the RRCA Groundwater Model to determine the net depletions from these wells, but disagreed on whether the RRCA Groundwater Model should be informed of the water delivered from the CCP. The Arbitrator reviewed Kansas' and Colorado's positions and noted that the expert evidence provided by Kansas had demonstrated that use of the CCP would result in an increase in negative pumping impacts and had raised a related issue regarding the treatment of transit losses between the point of discharge and Swanson Reservoir. The Arbitrator concluded that it was reasonable for Kansas to insist that such impacts be considered in calculating the amount of augmentation credit, whether by use of the RRCA Groundwater Model or through some other approach.

Based on further discussion with Kansas, Colorado proposes that Colorado be given 100% credit for CCP deliveries as an offset to stream depletions to the North Fork of the Republican River, provided the deliveries are in compliance with the other terms and conditions of the resolution, and that the CCP deliveries be included in all runs of the RRCA Groundwater Model (including the "Colorado Pumping" and the "No Colorado Pumping" runs used to determine stream depletions), as shown in the proposed revisions to the RRCA Accounting Procedures.

### **5.2. Kansas' Objection Number 2: The North Fork Credits Should be Limited to Protect Kansas' Allocation in the South Fork Sub-basin**

Kansas' second objection to Colorado's Proposal was that it would allow Colorado to replace its South Fork overuse on the North Fork for purposes of determining Compact compliance with sub-basin allocations.

The Arbitrator concluded that, at a minimum, the CCP proposal as presented for the arbitration did not clearly describe the specific limitation Colorado acknowledged was intended with respect to providing sub-basin credit only in the North Fork sub-basin and that the proposal should be clarified. She also recommended that the amount of augmentation credit approved for the North Fork, and subsequently applied to the determination of Statewide compliance, should be reasonably tied to the amount of estimated overuse in the North Fork.

Colorado's proposed revisions to the RRCA Accounting Procedures have clarified that augmentation deliveries to the North Fork from the Pipeline will be credited only against stream depletions in the North Fork sub-basin in Table 4A of the RRCA Accounting Procedures and will not be credited against stream depletions in the South Fork of the Republican River. (Table 4A is used to determine Colorado's compliance with the sub-basin non-impairment requirement.)

Kansas also objected to Colorado's CCP Proposal because it did not address the sub-basin non-impairment requirement on the South Fork of the Republican River. To address Kansas' concern about Colorado's compliance with the South Fork sub-basin non-impairment requirement, the Colorado State Engineer ordered Bonny Reservoir to be drained and has proposed revisions to the RRCA Groundwater Model accounting for Bonny Reservoir. That proposal and a resolution are before the RRCA contemporaneously with the CCP proposal and resolution.

### **5.3. Kansas' Objection Number 3: The Operational Limits in Colorado's Proposal Are Insufficient**

Kansas' third objection to Colorado's Proposal was that the limitations set forth in the Colorado Resolution were insufficient to require such deliveries on a reliable basis and instead left those deliveries to Colorado's discretion.

The Arbitrator reviewed Kansas' concerns and Colorado's responses concerning operation of the CCP and concluded, at a minimum, that the specific additional operation details should be integrated into a single, unified CCP Proposal and that clarification was also needed regarding substantive standards and operational limits in response to the questions raised by Kansas.

Colorado has revised the Colorado Proposal regarding the operational details and limits for projected deliveries based on the Arbitrator's recommendations.



There was little or no disagreement between Kansas and Colorado on the basic procedure that would be used to estimate the projected Pipeline deliveries each year. The status of Colorado's compliance with its allocations in the prior four years would be considered and a projection would be made of the amount of the deliveries required for the current year. The status of Colorado's compliance over the prior four years will be more or less known at the beginning of the current year (although the final accounting for the prior four years will not have been completed). The more difficult problem is making a projection of the deliveries required for the current year because Colorado's allocations and computed beneficial consumptive use are not known at the beginning of the year and are determined by the hydrology during the year.

To address concerns that Colorado would over-deliver a large amount of augmentation water in one year and then little or no augmentation water in the succeeding four years, Colorado agreed to make a minimum annual delivery of 4,000 acre-feet. By April 1, Colorado will make a projection of deliveries for the year based on any deficit from the prior four years and the minimum annual delivery of 4,000 acre-feet. No later than September 1<sup>st</sup>, Colorado will gather provisional hydrologic data for the months of January through August of the year and will update the estimate of the amount of deliveries needed for Compact compliance for the remainder of the year after accounting for the deliveries earlier in the year. These operational details are incorporated into the revised Colorado resolution.

Colorado had proposed a limit on the augmentation water supply credit based on a "Projected Delivery." Colorado has revised how the Projected Delivery will be estimated consistent with the presentation during the 2010 arbitration.

#### **5.4. Kansas' Objection Number 4: The Colorado Resolution Lacked "Temporal Limits"**

Kansas objected to the Colorado CCP Proposal because it did not include "temporal limits". Kansas asserted that the Ogallala aquifer of eastern Colorado, which is the source of augmentation supply for the CCP, is finite and exhaustible and is not sustainable at current rates of water level declines. Colorado asserted that water level declines in the area would diminish in the future as irrigated lands at the edge of the aquifer went out of production and that the CCP would have an indefinite life span.

The Arbitrator reviewed both States' positions and concluded that some type of time limit or periodic review should be included and recommended that an initial

approval for a period of 20 years would be appropriate and should include provisions for on-going periodic review with assurances that the CCP may continue in operation unless there is a substantial change in basin conditions demonstrating the augmentation plan is not sustainable.

Colorado has incorporated the Arbitrator's recommendation for an initial 20-year approval after the CCP begins operation and periodic review every 20 years thereafter, with the provision that the CCP may continue in operation unless there is a substantial change in basin conditions demonstrating that the augmentation plan is not sustainable.

**5.5. Kansas' Objection Number 5: Colorado's Proposed Changes for the RRCA Accounting Procedures Were Incomplete and Required Further Review**

Kansas asserted that the States had not conducted a detailed review of Colorado's proposed changes to the RRCA Accounting Procedures.

The Arbitrator concluded that the specific changes Colorado had proposed to the RRCA Accounting Procedures were complete for the purposes of implementing the CCP Plan as proposed, but that further changes would be needed to incorporate recommended changes in order to allow for final approval.

Colorado has revised the proposed changes to the RRCA Accounting Procedures based on the Arbitrator's recommendations and further discussions with Kansas, and Kansas will have an opportunity to review them before action is taken by the RRCA on Colorado's proposed resolution.

**5.6. Kansas' Objection Number 6: Colorado's Proposed "Catch-Up" Provisions Were Unreasonable**

Kansas expressed concern that the "catch-up" provisions Colorado had proposed had not been the subject of any sustained discussion among the States prior to the arbitration and were not reasonable.

The Arbitrator concluded that there was nothing inherently wrong with the methodology Colorado had developed for determining projected deliveries and for making subsequent adjustments in the following year to reflect its actual compliance obligations, but said that the essence of Kansas' objection to the so-called "catch-up" provisions was its underlying concern about the potential for under- or over-deliveries under the augmentation plan. The Arbitrator concluded that the CCP proposal was deficient in its current form because it did not adequately incorporate into a single,

integrated proposal all of the operational details and limits that Colorado had described and relied upon at trial, including the “catch-up” provision.

Colorado has revised the Colorado resolution based on the Arbitrator’s recommendations to include a required minimum delivery to address concerns regarding the potential for under- or over-deliveries under the augmentation plan.

**5.7. Kansas’ Objection Number 7: Colorado’s Proposed Expansion of its Augmentation Plan Was Unreasonable and Must Be Separately Approved by the RRCA**

Kansas expressed concern that the proposed Colorado resolution would allow its augmentation to increase to 25,000 acre-feet per year, which was far greater than the amount by which Colorado had exceeded its Compact Allocation. Kansas insisted that any plans to expand the water supply must be separately approved by the RRCA.

Paragraph 6 of the previously proposed Colorado resolution provided that Colorado could acquire additional groundwater rights to be pumped through the Compact Compliance Wells upon the terms and conditions of the resolution; however, it required Colorado to file a notice identifying the additional groundwater rights and gave RRCA members sixty days from the notice to object to the addition of groundwater rights. If there was an objection, the notice would be treated as an application for approval of an augmentation plan.

The Arbitrator concluded that the approach proposed by Colorado offered essentially the same procedural safeguard that Kansas asserted was lacking and that the Colorado plan was sufficient in this regard and no further changes were needed.

While the Arbitrator concluded that no further changes were needed, Colorado has revised its proposal regarding the addition of additional groundwater rights based on further discussions with Kansas (see Resolution, ¶ 11).

**5.8. Kansas’ Objection Number 8: Colorado and Nebraska’s Refusal to Disclose the Terms of a Stipulated Agreement was Unreasonable and Required that the CCP be rejected**

Kansas asserted that Colorado and Nebraska’s refusal to disclose the terms of a stipulated agreement was unreasonable and required that the CCP be rejected.

The Arbitrator concluded that the refusal by Colorado and Nebraska to disclose the terms of the stipulated agreement did not mandate that the CCP proposal be rejected and that in the absence of a motion to compel production of the document, it

was not necessary to deal directly with this issue in the arbitration proceedings. This issue is now moot because the stipulated agreement has been produced to Kansas.

### **5.9. Revised Colorado Resolution**

The revised resolution for the RRCA to approve the Colorado CCP is submitted contemporaneously to the RRCA with this Application.

### **6.0 ENGINEERING ANALYSIS FOR THE COLORADO COMPACT COMPLIANCE PIPELINE**

At the present time, Colorado has estimated that at least 4,000 acre-feet of water per year needs to be supplied by the Colorado CCP to meet Colorado's Compact statewide allocation, and Colorado has agreed with Nebraska that it will make a minimum delivery of 4,000 acre-feet during the months of January through March. The other terms agreed to be Colorado and Nebraska are set forth in the Joint Notice of Stipulation filed in the arbitration before Martha Pagel, Arbitrator. A copy of the Joint Notice of Stipulation is attached as Appendix B.

The initial capacity of the main transmission pipeline is 3,000 acre-feet per month.

Second, to address Kansas' concern that the CCP proposal would allow Colorado to replace South Fork overuse with augmentation flow delivered to the North Fork for purposes of determining Compact compliance with sub-basin allocations, the Colorado State Engineer has ordered Bonny Reservoir to be drained to reduce Colorado's beneficial consumptive use in the South Fork sub-basin.

### **6.1. Water Quality**

All of the streamflow in the North Fork of the Republican River, with the exception of occasional rainstorm events, is derived from ground water inflow from the Ogallala Aquifer. The Colorado CCP will deliver ground water from the Ogallala aquifer to the North Fork of the Republican River at an outlet structure a short distance upstream from the Colorado-Nebraska State line. Table 2 represents the ground water quality of the Ogallala aquifer relative to the water quality standards for the North Fork of the Republican River, as published by the Colorado Water Quality Control Commission. The water quality of the Ogallala Aquifer meets or exceeds drinking water standards. Thus, the water quality of ground water for the Republican River Compact Compliance

Pipeline is appropriate for delivery to the North Fork of the Republican River to offset stream depletions.

## **6.2. Colorado CCP Design and Construction**

The RRWCD WAE contracted with GEI Consultants to prepare a preliminary feasibility study for the design of a compact compliance pipeline. The \$50,000 study was completed in January of 2008. Based on the recommendations in the preliminary report, the RRWCD WAE contracted with GEI Consultants to proceed with the final design of the Colorado CCP. The final design was completed in 2008, and construction of the Colorado CCP was completed in 2012.

The well field to pump ground water consists of 8 wells numbered A2 through A8 and B5 as shown in Figure 4. The design of the Colorado CCP allows for an additional 7 wells numbered A1, and B2 through B4, B6, and B7 in Figure 4 to be connected as needed. The RRWCD has agreed that pumping from any individual Compact Compliance Wells will not exceed 2,500 acre-feet per year, and this limitation was incorporated into the Colorado Ground Water CGWC's approval of the change of the ground water rights.

Water pumped from the individual wells is collected in a series of collector pipelines that vary in size from 12" to 24." The water is then conveyed to a 140,000 gallon re-regulating storage tank. The storage tank provides reserve capacity allowing the main pipeline to operate for 11 minutes at two-thirds capacity with no inflow to the tank from the well field. The storage tank also provides protection of the main pipeline from surges and negative pressures that could develop if the main pipeline were connected directly to the well field collection system.

From the storage tank water flows by gravity through the main transmission pipeline approximately 12.7 miles to the North Fork of the Republican River. The alignment of the pipeline is shown on Figure 4.

Releases from the tank are regulated by a discharge valve located at the end of the transmission pipeline, and an electromagnetic flow meter is located just upstream of the discharge valve. The electromagnetic flow meter readings may be used in conjunction with turbine flow meters at each supply well to monitor the pipeline for leakage. A SCADA system is used to monitor and operate the wells and pipeline. The main transmission pipeline is designed so that additional wells may be added to the

project to increase the pipeline capacity to approximately 25,000 acre-feet per year. The pipeline is buried with minimum cover of three feet above the crown of the pipe. Access manholes, air release valves, and drain valves have been provided at appropriate locations along the pipeline.

The Colorado CCP was tested in 2012, and is currently functional and capable of delivering water; however, the water rights for the CCP are currently under lease for irrigation use. Therefore, deliveries will not begin until January 2014 at the earliest.

## **7.0 REQUEST FOR APPROVAL**

The State of Colorado on behalf of the RRWCD WAE requests that the RRCA approve the revised augmentation plan and related accounting procedures for the Colorado CCP described above under Subsection III.B.1.k of the Final Settlement Stipulation. A proposed resolution for approval of the Colorado CCP that incorporates terms and conditions consistent with the State of Nebraska's approval of the Colorado CCP Project and revisions based on the Arbitrator's Final Decision and discussions with Kansas is submitted contemporaneously to the RRCA with this Application. Because Colorado's compliance with the sub-basin non-impairment requirement in the Final Settlement Stipulation (Art. IV.B) for the South Fork of the Republican River was raised by the State of Kansas as an issue during the 2010 arbitration, the Colorado State Engineer ordered Bonny Reservoir to be drained to reduce the beneficial consumptive use charged to Colorado under the RRCA Accounting Procedures so as not to impair the ability of Kansas to use its South Fork sub-basin allocation within the South Fork sub-basin. To properly reflect the change in operation of Bonny Dam and Reservoir, Colorado is separately submitting a proposed resolution to change the representation of Bonny Reservoir in the RRCA Groundwater Model.

RRWCD Compact Compliance Wells						4-Jan-2013
Permit #		RRWCD submitted & GWC published (af/yr)	Corrected amount (af/yr)	Sand Hills approved for export (af/yr)	To be approved by GWC (af/yr)	Comments
		first publication				
12567-FP		201		N/A	0	Located in Central Yuma GWMD
12589-FP		376	297	372	297	Acres corrected from 309 ac to 200 ac
12967-FP	same well	345		333	333	
16920-FP		0			0	
13509-FP	same well	254		273	244	
16075-FP		30			29	
13511-FP		192		173	173	
13513-FP	same well	258		257	220	
16074-FP		44			37	
13522-FP		204		189	189	
13813-FP	same well	174		203	171	
16923-FP		32			32	
13814-FP		334		323	323	
13815-FP		291		311	291	Sand Hills approved more than historical amount
13856-FP	same well	241		249	241	
16067-FP		8			8	
13857-FP		229		217	217	
13858-FP		228		206	206	
13859-FP	same well	228		260	220	
16069-FP		42			40	
14018-FP		252		234	234	
14019-FP		217		206	206	
14022-FP		289		255	255	
14023-FP		219		197	197	
14024-FP		141		129	129	
14027-FP		251		237	237	
14028-FP		218		202	202	
14121-FP		437		420	420	
14122-FP		215		204	204	
14396-FP		192		180	180	
14397-FP		192		184	184	
14398-FP		240		230	230	
14600-FP		197		187	187	
14718-FP		526		526	526	
14719-FP		455		424	424	
14753-FP		310		267	267	
15285-FP		161		140	140	
18011-FP		431		421	421	
18012-FP	same well	221		317	218	
19000-FP		101			99	
18013-FP		350	291	350	291	Acres corrected from 250 ac to 228 ac
18014-FP		259		247	247	
18015-FP		549		497	497	
18017-FP	same well	180.5		353	177	
19001-FP		180.5			177	
18018-FP		230		218	218	
18019-FP		173		163	163	
18780-FP		192		192	192	
18781-FP		216		206	206	
18783-FP		273		273	273	
18966-FP		172		172	172	
19005-FP		178		174	174	
19372-FP		218		211	211	
20896-FP		169		168	168	
21476-FP		144		139	139	
subtotal		12,259	12,121	11,689	11,535	
		second publication				
14033-FP		279		279	279	
19004-FP		141		141	141	
23222-FP		230	168	230	168	Pumping corrected to permitted amount
4319-FP	same well	75		75	75	
4922-FP		0			0	
20198-FP		194		194	194	
20196-FP		249		249	249	
subtotal		1,168	1,106	1,168	1,106	
Total		13,427	13,227	12,857	12,641	

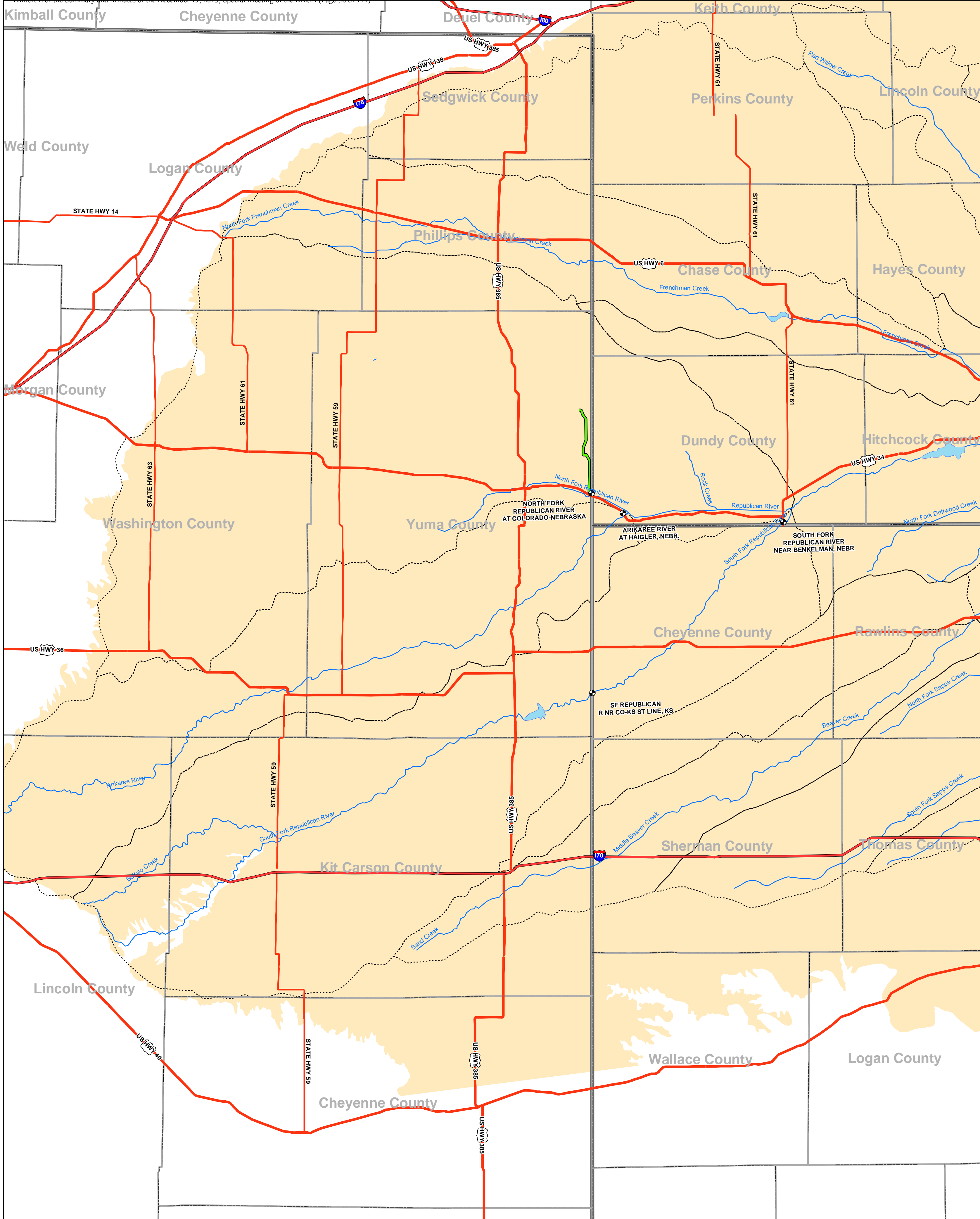
**Table 2**  
**Comparison of stream water quality in the North Fork to the ground water quality in the Ogallala Formation.**

<b>Surface Water Classification and Associated In-Stream or Drinking Water Standards <sup>(1)</sup></b>	
<b>Classifications:</b>	
Aquatic Life -- Cold Water 1	N/A
Recreation -- 1a	N/A
Water Supply – Agriculture	N/A
<b>Physical and Biological Standards:</b>	
Dissolved Oxygen = 6.0 mg/l	0.2 to 8.6 mg/l; 50% > 5.4 mg/l
pH = 6.5-9.0	7.0 – 7.9
Fecal coliforms = 200/100 ml	
E Coli = 126/100 ml	
<b>Inorganic Standards:</b>	
Ammonia (acute) = Table Value Standard (TVS)	
Ammonia (chronic) = 0.02 mg/l	0.01 to 0.244 mg/l; 50% < 0.015 mg/l
Chlorine (acute) = 0.019 mg/l	
Chlorine (chronic) = 0.011 mg/l	
Cyanide = 0.005 mg/l	
Sulfide = 0.002 mg/l	
Boron = 0.75 mg/l	Dissolved boron: 20 – 130 µg/l
Nitrate NO <sub>2</sub> = 0.05 mg/l	< 0.01 mg/l
Nitrate NO <sub>3</sub> = 10 mg/l	1.1 to 8.9 mg/l
Chloride = 250 mg/l	1.4 to 29.5 mg/l
Sulfate = 250 mg/l	5.5 to 95.7 mg/l
Total Dissolved Solids = 500 mg/l	219 to 461 mg/l
<b>Metal Standards:</b>	
Arsenic (acute) = 50 µg/l (total recoverable)	Dissolved arsenic: <5-12 µg/l
Cadmium (acute) = TVS (trout)	
Cadmium (chronic) = TVS	
Trivalent Chromium (acute) = 50 µg/l (total)	
Hexavalent Chromium (acute/chronic) = TVS	
Copper (acute/chronic) = 1.3 mg/l	Dissolved copper: <5-35 µg/l
Iron (chronic) = 300 µg/l	Dissolved iron: <3-60 µg/l
Iron (chronic) = 1000 µg/l (total recoverable)	
Lead (acute/chronic) = TVS (dissolved 15µg/l)	Dissolved lead <5 µg/l
Manganese (acute/chronic) = TVS (dissolved 50µg/l)	Dissolved manganese <3-40 µg/l
Manganese (chronic) = WS (dissolved)	
Mercury (chronic) = 0.01 µg/l (total)	
Nickel (acute/chronic) = TVS	
Selenium (acute/chronic) = TVS (dissolved 50 µg/l)	Dissolved selenium: <5 µg/l
Silver (acute) = TVS	
Zinc (acute/chronic) = TVS	Dissolved Zinc < 5-124 µg/l

Notes:

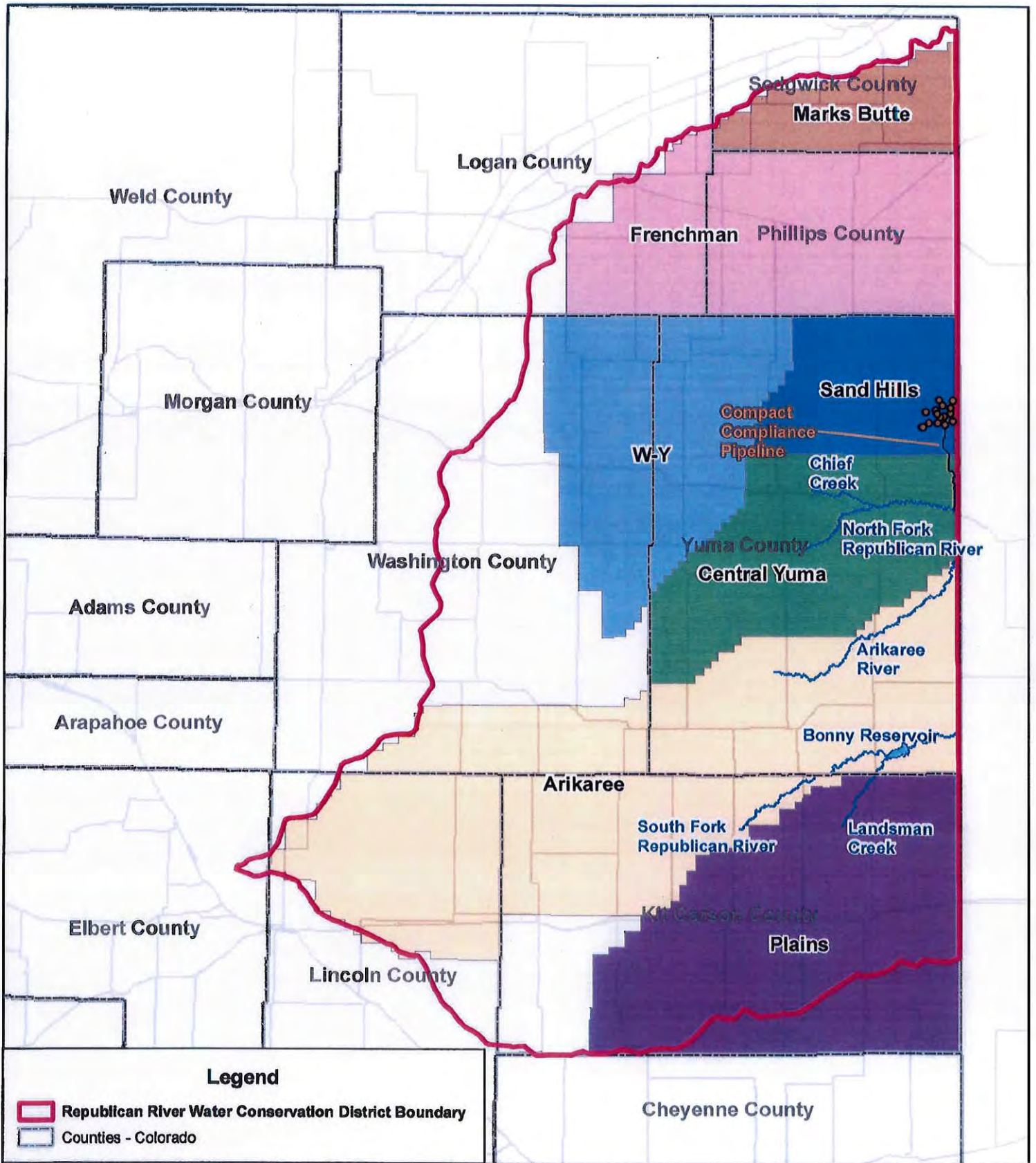
1. Stream classifications and water quality standards obtained from a report by David Litke, U.S. Geological Survey, and Historical Water-Quality Data for the High Plains Regional Ground-Water Study Area (1930 – 1998) or from CDPHE/WQCC – Colorado Primary Drinking Water Standards.
2. Blanks indicate data that were not reported in the reference.
3. Reported ground water quality data is from Litke, USGS (see Note 1).





**FIGURE 1  
GENERAL LOCATION MAP**

Prepared by  
HELTON & WILLIAMSEN, P.C.



**Legend**

- Republican River Water Conservation District Boundary
- Counties - Colorado

0 7.5 15 30  
Miles

**Slattery & Hendrix  
Engineering LLC**

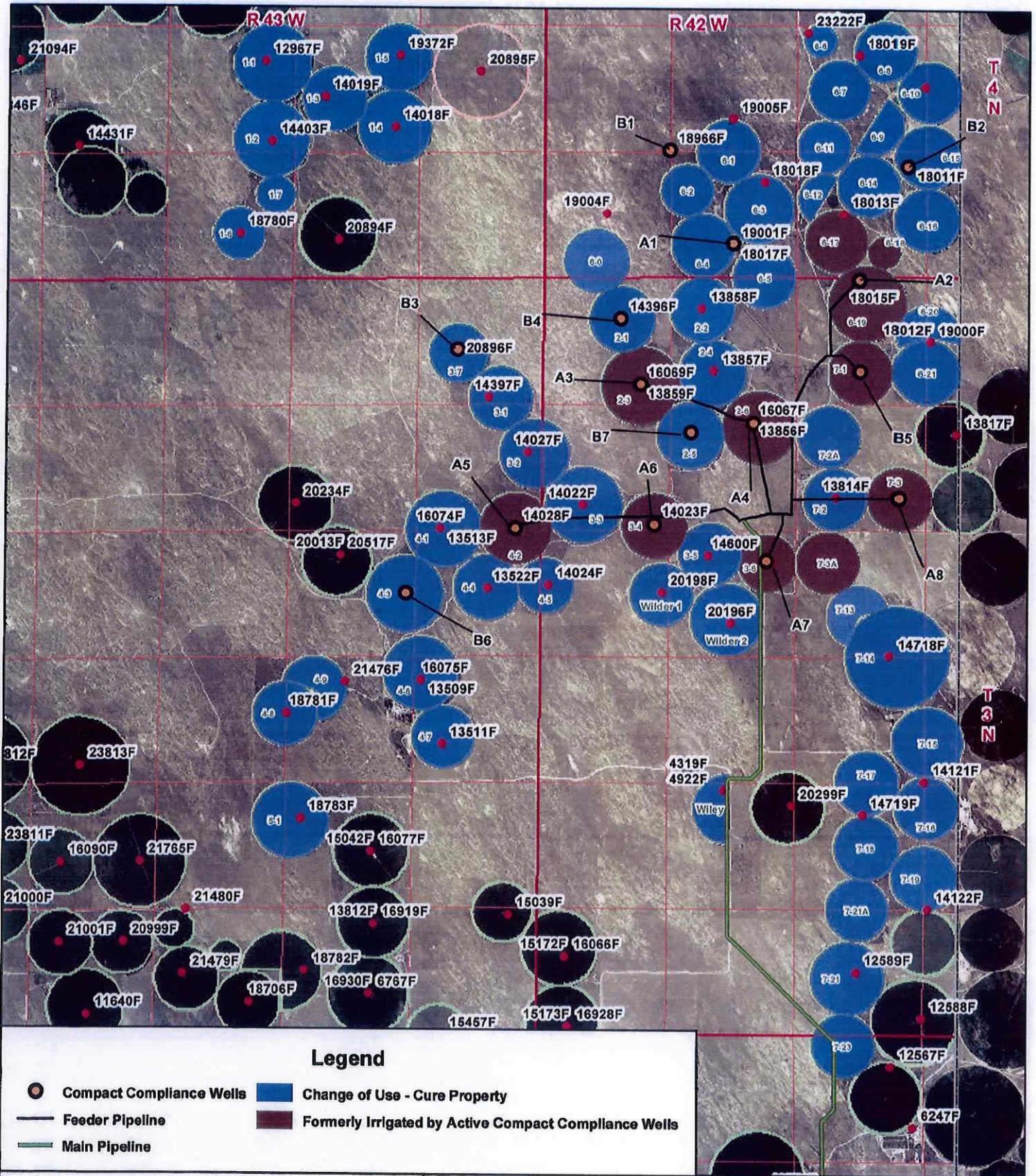
Job No.  
P2501

File:  
Figure 3 RRB.mxd

Date:  
05/19/10

Prepared For:  
RRWCD

**Figure 2**  
**Colorado Republican River Basin**  
**Republican River Water Conservation District  
and  
Groundwater Management District Boundaries**



**Legend**

- Compact Compliance Wells
- Change of Use - Cure Property
- Feeder Pipeline
- Formerly Irrigated by Active Compact Compliance Wells
- Main Pipeline



Job No.  
R1601

File:  
Cure Farms  
Lease.mxd

Date:  
11/01/11

Prepared For:  
RRWCD

**Slattery & Hendrix  
Engineering LLC**

**Figure 3**  
**General Location Map**  
**Cure Farms**  
**Compact Compliance Wells**

Data Sources:  
County Digital Raster Graphics from USDA;  
Irrigated Acreage from Slattery & Hendrix Engineering LLC

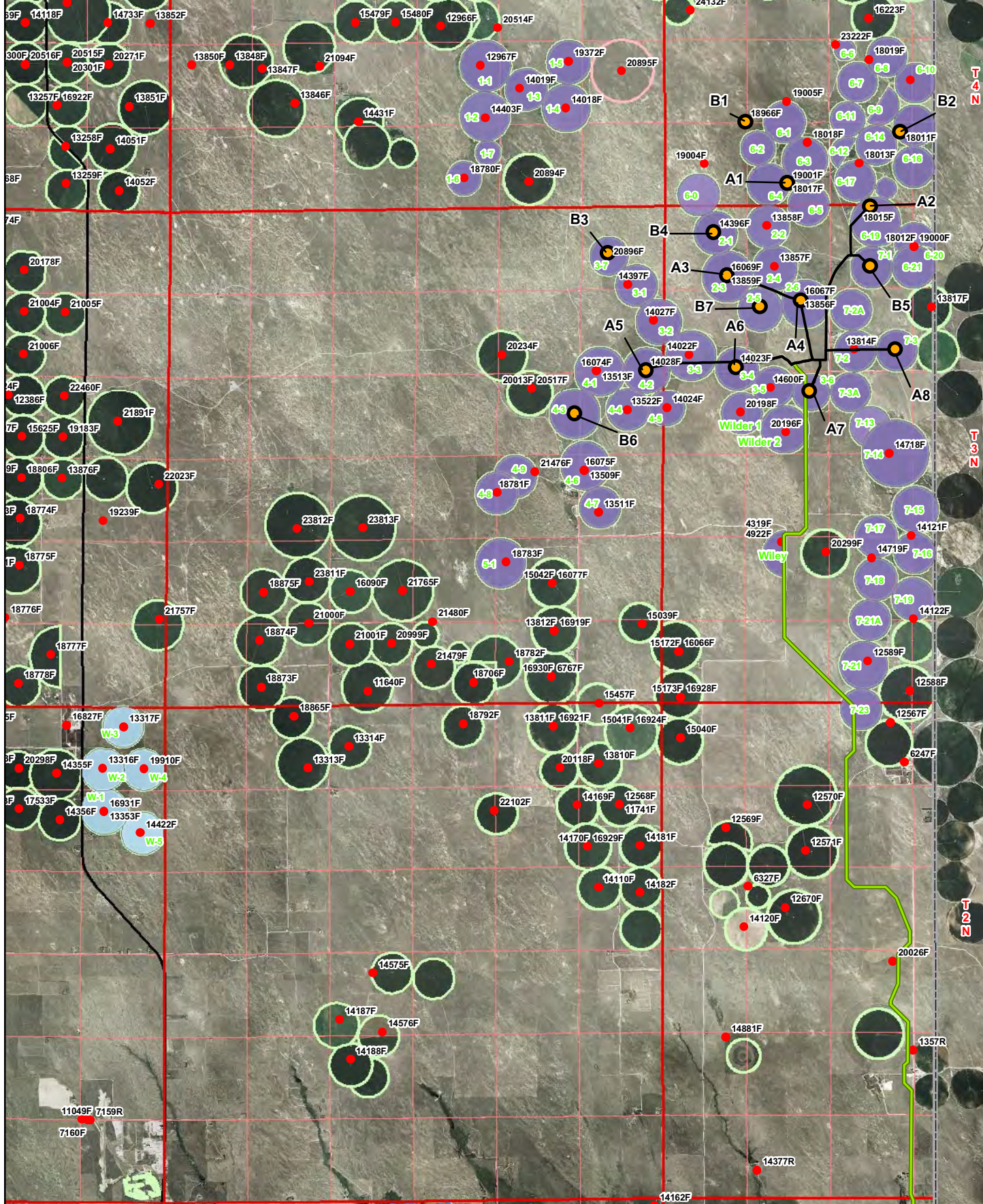





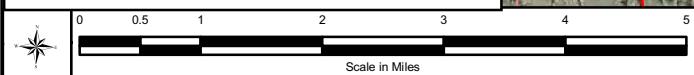


Figure 4  
Well Location &  
Irrigated Acreage  
Prepared by:  
HELTON & WILLIAMSEN, P.C.

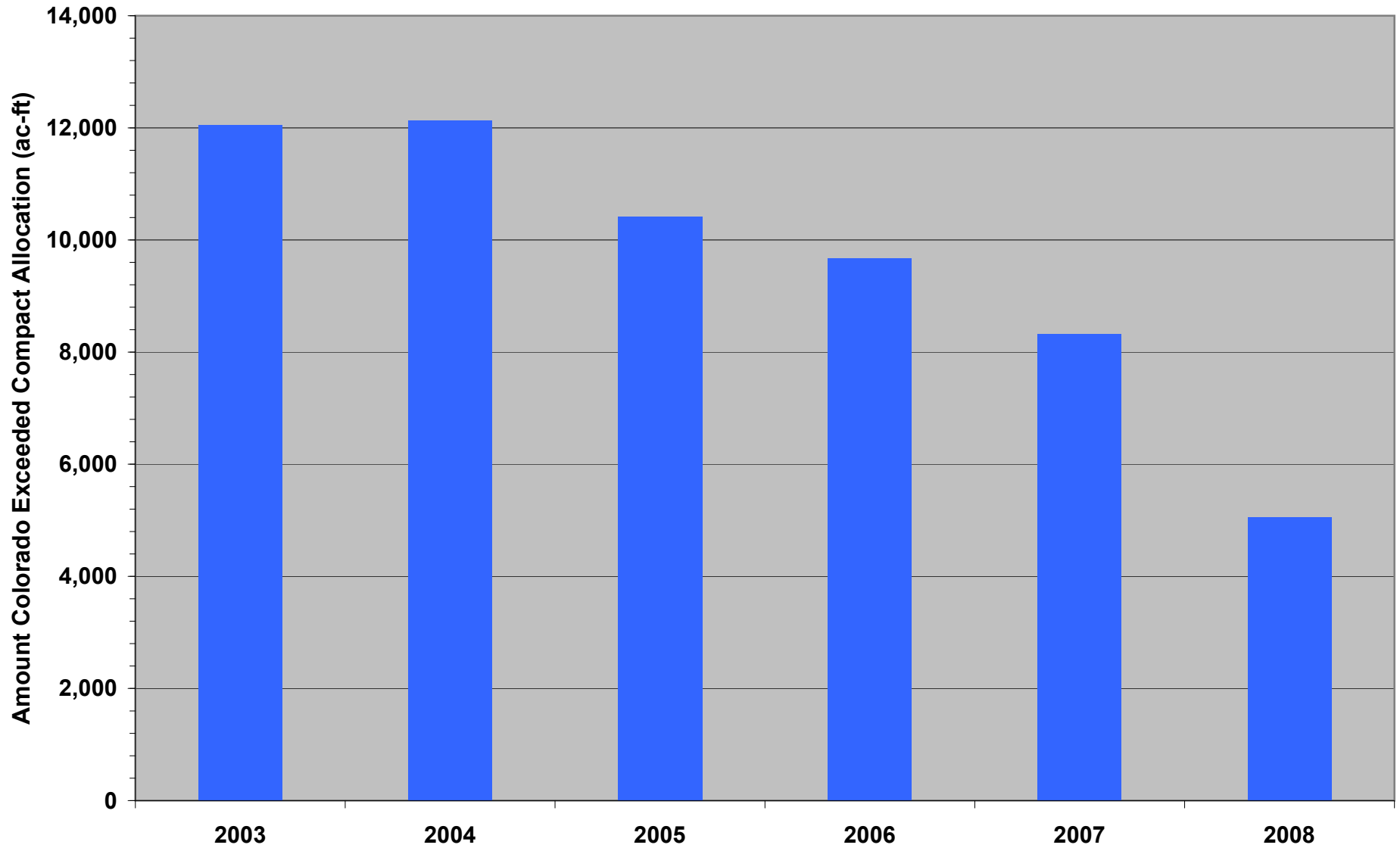
**Legend**

 Compact Compliance Wells	 Change of Use - Cure Property
 Feeder Pipeline	 Dryden Property
 Main Pipeline	

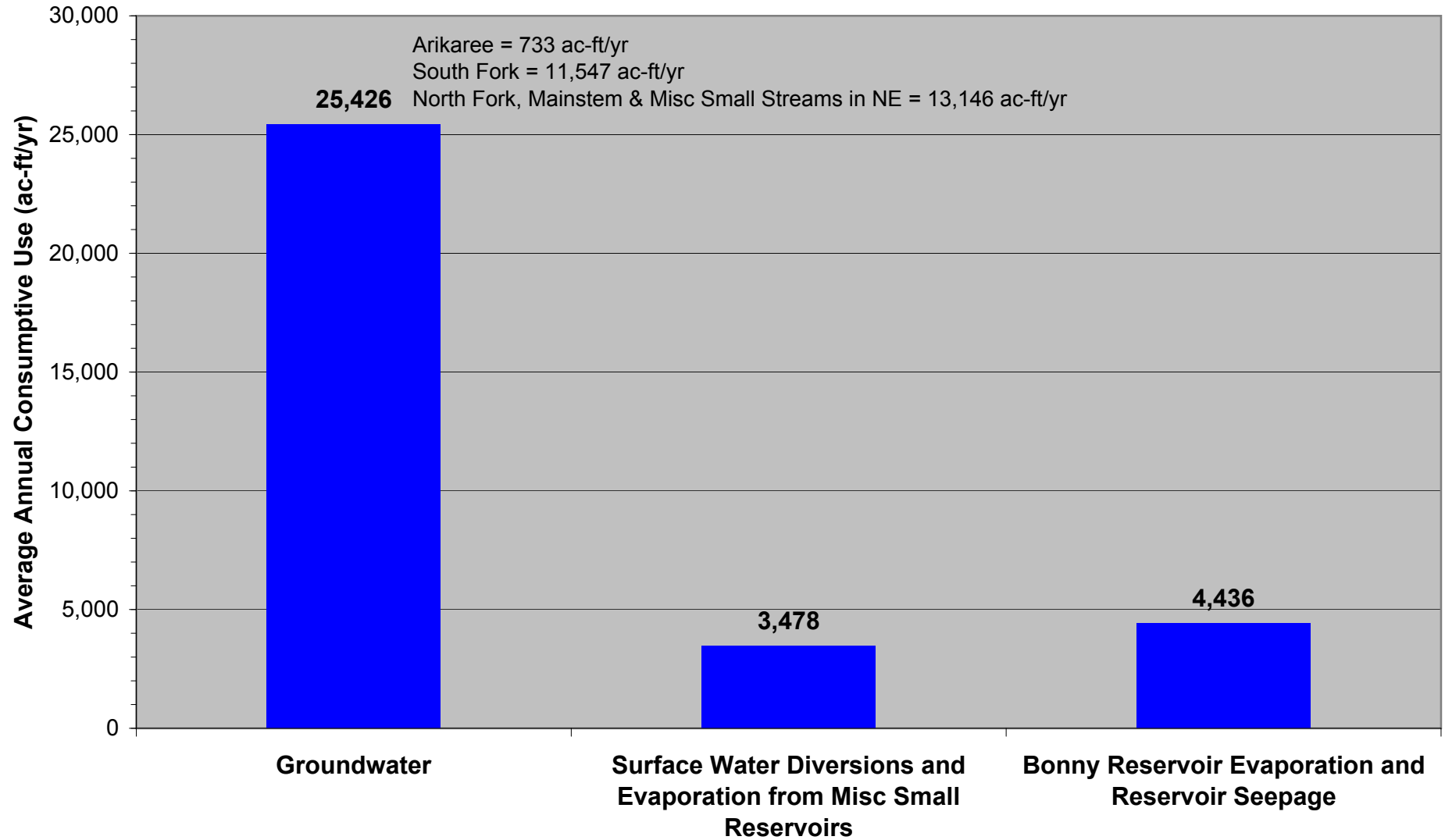


Data Sources:  
County Digital Raster Graphics from USDA;  
Irrigated acreage from Helton & Williamsen  
2008, RLH

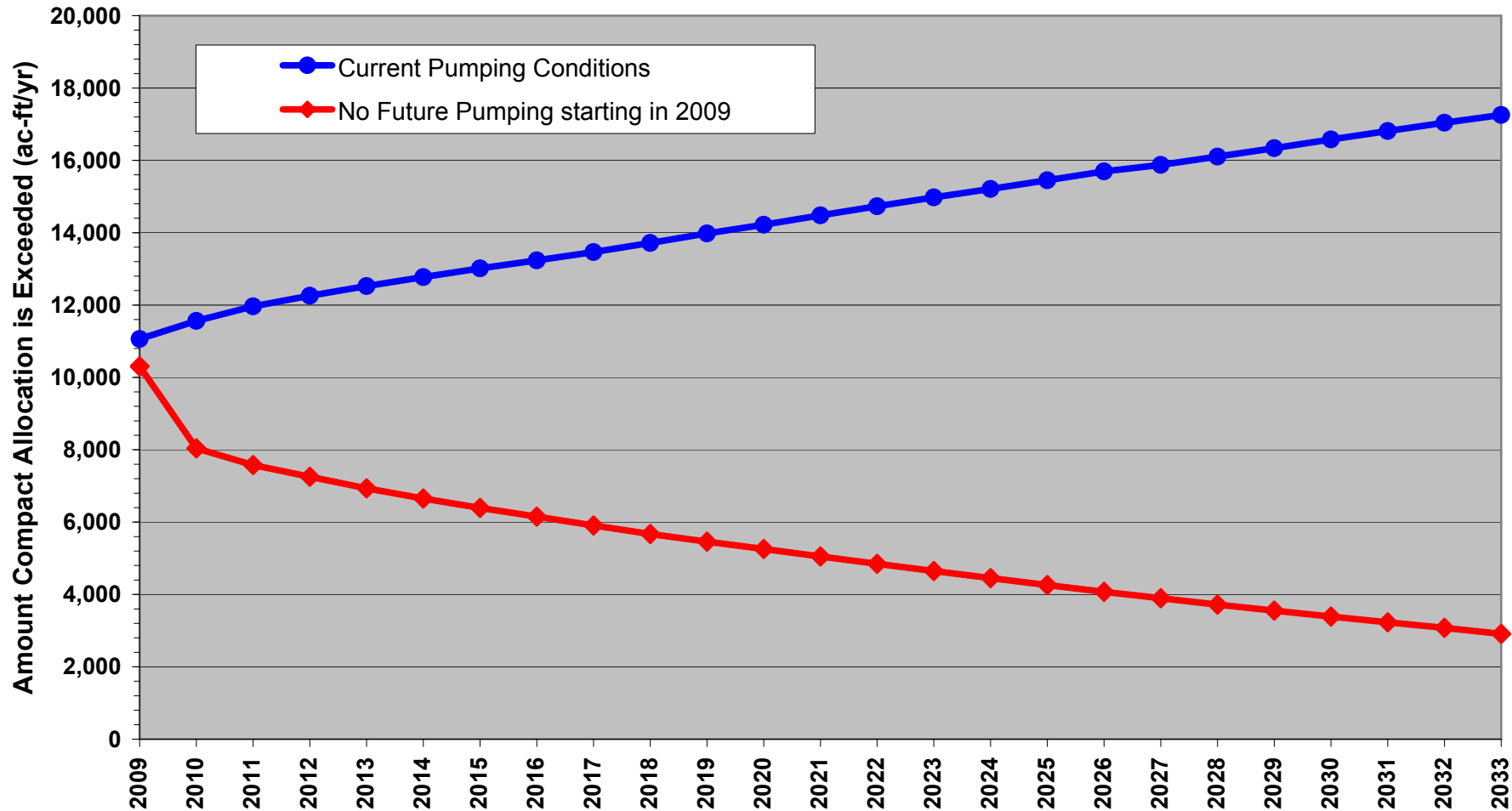
### Figure 5 Amount Colorado Exceeded Compact Allocation



**Figure 6**  
**Components of Historical Consumptive Use In Colorado**  
(Average for 2003-2007)

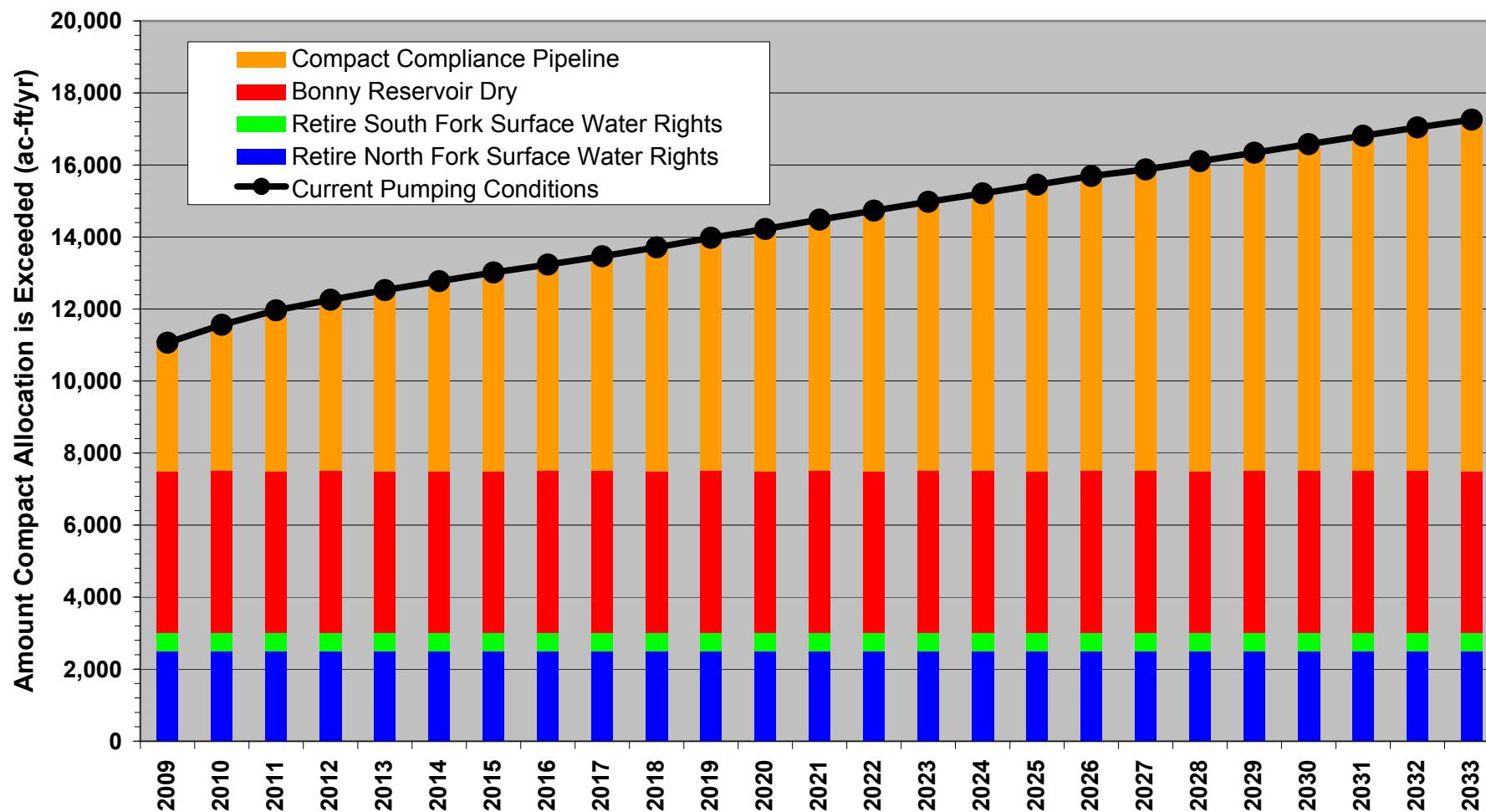


### Figure 7 Projected Compact Compliance under Current Pumping and No Pumping Conditions



Note: The current pumping conditions projection assumes projected pumping conditions are equal to the average pumping for the 1999-2008 period and the precipitation recharge is equal to the 1918-2008 average. The amount the compact allocation is exceeded is based on the average value for the 2003-2007 period and does not reflect the 2,500 ac-ft/yr reduction in Colorado's consumptive use from the surface water rights purchased by Colorado.

### Figure 8 Projected Compact Compliance with Compact Compliance Pipeline in Operation



Note: The current pumping conditions projection assumes projected pumping conditions are equal to the average pumping for the 1999-2008 period and the precipitation recharge is equal to the 1918-2008 average. The amount the compact allocation is exceeded under current pumping conditions is based on the average value for the 2003-2007 period and does not reflect the 2,500 ac-ft/yr reduction in Colorado's consumptive use from the surface water rights purchased by Colorado.



<p>SANDHILLS GROUND WATER MANAGEMENT DISTRICT</p>	
<p>CONCERNING THE EXPORT APPLICATION OF THE REPUBLICAN RIVER WATER CONSERVATION DISTRICT, acting by and through its WATER ACTIVITY ENTERPRISE</p>	
<p><b>FINDINGS OF FACT, CONCLUSIONS OF LAW, AND DECISION</b></p>	

This matter came on for hearing on January 24, 2012, before the Board of Directors (“Board”) of the Sandhills Ground Water Management District (“GWMD” or “District”) on the application of the Republican River Water Conservation District, acting by and through its Water Activity Enterprise (“RRWCD”), to use ground water outside the boundaries of the Sandhills GWMD.

Having considered the application and the evidence presented, the Sandhills GWMD Board makes the following findings of fact, conclusions of law, and decision:

1. The RRWCD initially submitted a letter dated February 25, 2008, to the Board requesting authorization and approval to use ground water under specified ground water rights outside the boundaries of the District for the sole purpose of offsetting stream depletions to the Republican River and its tributaries in order to comply with the State of Colorado’s allocations under the Republican River Compact (“Compact”) and the Final Settlement Stipulation (“FSS”) in *Kansas v. Nebraska and Colorado*, No. 126, Original (U.S. Supreme Court). RRWCD Exh. 1. The RRWCD requested a hearing on its request at the Board’s earliest convenience. *Id.*

2. At that time of the initial request, the RRWCD had entered into an agreement to purchase ground water rights in the District, had applied for a \$60 million loan from the Colorado Water Conservation Board (“CWCB”) to purchase the ground water rights and to build a pipeline to deliver ground water from existing wells in the District to the North Fork of the Republican River (“Pipeline project”) and had filed applications with the Colorado Ground Water Commission (“Commission”) to change the use of the ground water rights to be purchased to Compact Compliance wells and had requested a variance from certain Commission Rules to consolidate the wells to reduce the cost of constructing and operating the Pipeline project. RRWCD Exh. 1.

3. The District is a ground water management district formed under the provisions of the Colorado Ground Water Management Act (“Act”) and has the powers provided in the Act. § 37-90-101 through 135, C.R.S.

4. Section 37-90-130(2)(f), C.R.S., of the Act provides that the District has the authority to regulate the use, control, and conservation of the ground water of the District covered by any well permit, including the authority “[t]o prohibit, after affording an opportunity for a hearing before the board of the local district and presentation of evidence, the use of ground water outside the boundaries of the district where such use materially affects the rights acquired by permit by any owner or operator of land within the district.”

5. At the time of the RRWCD’s February 28, 2008 initial request, the Board had adopted Rules, Regulations, and Guidelines (“Rules”), which included a rule prohibiting removal of ground water from the District unless authority is first obtained from the Board after a hearing. District Rule 3. The Board did not hold a hearing on the RRWCD’s initial export request at that time because the RRWCD did not know the credit that Colorado would receive for the Pipeline deliveries to offset stream depletions under the Compact, and the RRWCD agreed to postpone the hearing until more was known about this issue.

6. The States of Kansas, Nebraska, and Colorado entered into the FSS as of December 15, 2002, to resolve pending litigation in the U.S. Supreme Court regarding the Compact. RRWCD Exh. 7 at p. 4. The Special Master and the U.S. Supreme Court subsequently approved the FSS. *Kansas v. Nebraska and Colorado*, 538 U.S. 720 (2003). In Subsection III.A of the FSS, the States of Kansas, Nebraska, and Colorado adopted a moratorium on new wells, with certain exceptions set forth in subsection III.B of the FSS.

7. Subsection III.B.1.k of the FSS provides that the moratorium shall not apply to 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 net depletion to stream flow either annually or long term. Subsection III.B.1.K further provides that augmentation plans and related accounting procedures under this subsection shall be approved by the Republican River Compact Administration (“RRCA”) prior to implementation.

8. In March, 2008, the State of Colorado and the RRWCD submitted an application to the RRCA seeking approval of an augmentation plan and related changes to the RRCA Accounting Procedures for the Pipeline project, which provided that Colorado would receive 100% credit for Pipeline deliveries to the North Fork of the Republican River to offset stream depletions.

9. In August, 2009, Colorado submitted a proposed resolution to the RRCA to approve an augmentation plan and related changes to the RRCA Accounting Procedures for the Pipeline project.

10. At the RRCA annual meeting in August, 2009, the Kansas and Nebraska RRCA members voted against Colorado’s proposed resolution, and Colorado initiated non-binding arbitration pursuant to the FSS. RRWCD Exh. 9 at 2.

11. Before the arbitration hearing, Colorado and Nebraska entered in to a stipulation in which Nebraska agreed to support Colorado’s Pipeline resolution, subject to terms concerning the operation of the Pipeline project. RRWCD Exh. 8; RRWCD Exh. 9 at 2.

12. Following a hearing in July, 2010, the Arbitrator selected by the States issued a Final Decision on the Pipeline project dispute on October 7, 2010, in which the Arbitrator concluded that Kansas had not arbitrarily withheld its approval of the Pipeline project, but also concluded that the Pipeline project, in general, provided a reasonable and necessary approach for meeting Colorado's Compact obligations and, with the changes recommended in the Final Decision, stated that the Pipeline project should be approved. RRWCD Exh. 9 at pp. 21-22. Colorado and Kansas disagreed as to whether the RRCA ground water model should be used to calculate the credit that Colorado would receive for the Pipeline deliveries. The Arbitrator agreed that the expert evidence provided by Colorado was convincing in demonstrating that discharge from the Pipeline can and should be measured, rather than modeled, but concluded that the expert evidence provided by Kansas demonstrated that the Pipeline would result in an increase in "negative pumping impacts," and thereby provide a long-term additional benefit to Colorado to the detriment of Kansas. *Id.* at 10. The Arbitrator recognized possible options, and recommended a 10% reduction in credit for Pipeline deliveries as a reasonable reflection of the potential impact based on seasonal deliveries. *Id.* at 11.

13. Because of a concern that the Colorado Legislature would take the CWCB loan funds for the Pipeline project for other purposes because of budget shortfalls, the RRWCD Board of Directors proceeded with the purchase of the ground water rights for the Pipeline project, which was completed on June 19, 2009, RRWCD Exh. 10, and construction of the Pipeline project, which began in September, 2011. RRWCD Exh. 13.

14. In 2011, the Board proposed an additional rule to supplement the District's existing Rule 17, to add more detailed procedural requirements to clarify how export applications would be processed by the District.

15. On August 16, 2011, in accordance with proposed Rule 17A, the RRWCD submitted an application for export of water ("export application"), an engineering report prepared by Slattery & Hendrix Engineering LLC in support of the application, evaluations by the State Engineer's Office regarding the average annual historical withdrawals and depletions to the aquifer by the wells included in the Pipeline project, and legal and engineering information to support the export application. Exh. 1. The RRWCD also submitted proposed terms and conditions to prevent the export from materially injuring the District and water users within the District, and supplemental terms and conditions for the approval to export up to 500 acre feet of groundwater from eight Compact Compliance Wells and to deliver that water to the North Fork of the Republican River to test the Pipeline in 2012. RRWCD Exhs. 3 and 4.

16. On September 16, 2011, the RRWCD and the District entered into an agreement in which it was agreed that proposed Rule 17A would apply to the RRWCD's export request without the need for formal promulgation of the Rule, and the Board agreed, in full compliance with the procedural steps contained in proposed Rule 17A, to make reasonable efforts to expedite the time for holding a hearing and to issue a written decision on the export application in accordance with proposed Rule 17A and relevant statutes. Exh. 1.

17. After determining that the application was complete, the Board caused notice of the export application to be published in a newspaper with general circulation in Yuma County, Colorado, and allowed any person wishing to support or object to the approval of the application,

to provide other comments concerning the application, or to request party status, to do so in writing to be filed with the District no later than October 31, 2011, by a time specified in the notice. Exh. 2.

18. No objections to the export application were received. Support for the export application was filed by the Colorado Agriculture Preservation Association, the Central Yuma Groundwater Management District, the W-Y Ground Water Management District, the Boards of County Commissioners of Lincoln County, Kit Carson County, Yuma County, Washington County, Sedgwick County, Phillips County, and the Plains Ground Water Management District. The Frenchman Groundwater Management District and the Marks Butte Groundwater Management District requested party status for the export hearing. Bill Cure, on behalf of Cure Land, requested approval of the export application if 100% credit for water is obtained from the project under the Compact. Exhs. 4-16.

19. The Board then set the date for a hearing to be held on the export application for January 24, 2012, at the Wauneta Fire Hall, located north of Wray, Colorado and within the District, and caused notice of the hearing to be published in a newspaper of general circulation in Yuma County, Colorado. Exh. 3. The hearing took place on January 24, 2012, pursuant to the notice. The Board designated Michael D. Shimmin, Esq., to be the hearing officer to conduct the hearing, but the entire Board was present at the hearing and heard all of the evidence and comments presented. Testimony and documentary evidence was presented by three witnesses for the RRWCD, which is summarized below. All parties were allowed the chance for cross examination and to present testimony. Opportunity was also allowed for public comment by non-parties. A summary of the evidence and comments presented, and the Board's findings based on the evidence and comments follows.

20. The RRWCD is a water conservation district that was created by Colorado statute to assist the State of Colorado to comply with the Compact. § 37-50-101, -103, C.R.S.

21. The RRWCD has purchased ground water rights associated with a total of 62 well permits, of which 61 are located in the District as described in the engineering report, RRWCD Exh. 2 at 9, and has acquired easements for fifteen wells ("Compact Compliance Wells") in the District for the Pipeline project. The RRWCD has also acquired easements for the collector pipelines, a storage tank, the main pipeline, and the outfall structure.

22. The RRWCD proposes to pump the historical consumptive use of some or all of these groundwater rights from the Compact Compliance Wells into a pipeline and deliver that water into the North Fork of the Republican River near the Colorado/Nebraska state line as necessary to offset stream depletions in order to comply with Colorado's Compact allocations.

23. The RRCA has not approved an augmentation plan for the Pipeline project at this time, but Colorado has entered into a stipulation with Nebraska that gives Colorado full credit for Pipeline deliveries that are made in accordance with the stipulation, and Colorado is currently in discussions with Kansas concerning the credit that Colorado will receive for the Pipeline deliveries under the Compact.

24. At the hearing on the export application, the RRWCD provided testimony in support of the export application by: Dennis Coryell, President of the RRWCD Board of Directors; James E. Slattery, RRWCD engineer; and Dick Wolfe, the Colorado State Engineer.

25. Mr. Coryell testified about the history of the RRWCD, the RRWCD Board of Directors' efforts to assist Colorado to comply with the Compact by providing cost-sharing for federal conservation programs, why the RRWCD Board of Directors concluded that a Pipeline project was necessary to assist Colorado in achieving Compact compliance, and the feasibility study conducted by the RRWCD to select the location for the Pipeline project.

26. Mr. Slattery gave a presentation on the Pipeline project based on the engineering report submitted in support of the application and explained why the Pipeline project is necessary for Compact compliance and how the Pipeline project will be operated based on the stipulation between Colorado and Nebraska. He also explained the proposed terms and conditions for the export of ground water from the District.

27. Mr. Wolfe testified about the status of discussions with Kansas and answered questions from the Board about Colorado's efforts to obtain approval from Kansas for the Pipeline project.

28. The RRWCD offered 15 exhibits at the hearing, including the Joint Notice of Stipulation between Colorado and Nebraska (RRWCD Exh. 8), the Arbitrator's Final Decision on the Colorado Compact Compliance Pipeline Dispute (RRWCD Exh. 9), Corrected Resolution No. 08-06 of the RRWCD Board of Directors agreeing to limit pumping from the Compact Compliance Wells to a maximum of 2,500 acre-feet per year per well (RRWCD Exh. 11), answers to Export Questions that the Sandhills GWMD had submitted to the RRWCD before the hearing (RRWCD Exh. 14), and a letter dated September 6, 2011, from Keith Vander Horst, Designated Basin Team Leader, Colorado Ground Water Commission, explaining the actions of the Commission on the RRWCD's applications to change existing rights to designated ground water (RRWCD Exh. 15). These exhibits were admitted without objection.

29. The RRWCD has begun construction of the Pipeline and will need to divert up to 500 acre feet of groundwater from eight of the Compact Compliance Wells and to deliver that water into the North Fork of the Republican River near the Colorado/Nebraska State Line to test the Pipeline in 2012.

30. The RRWCD proposed the following terms and conditions on the approval of the export application pursuant to proposed Rule 17.A, which are found by the Board to be reasonable and appropriate, and they are incorporated into this Decision as binding terms and conditions on the future operation of the requested export and the Pipeline project:

1. The average annual historical consumptive use of the groundwater rights that may be diverted at the Compact Compliance Wells shall be as determined by the Colorado Ground Water Commission pursuant to its rules and regulations, provided that the average annual historical consumptive use of the groundwater rights listed on Table 3 of the Engineering Report prepared by Slattery & Hendrix Engineering LLC

dated August 17, 2011 (RRWCD Exh. 2), shall not exceed the average annual amounts shown in column (6) on Table 3 (Corrected Historical Consumptive Use). Annual diversions during any calendar year under the groundwater rights listed on Table 3 shall not exceed the total corrected annual historical consumptive use of the groundwater rights as shown in column (6) of Table 3, except as provided in paragraph 5 below. A copy of Table 3 is attached as Exhibit A and incorporated in these Findings.

2. Groundwater diversions from the Compact Compliance Wells shall be measured by totalizing flow meters, at the RRWCD's expense, in compliance with the Rules and Regulations Governing the Measurement of Ground Water Diversions located in the Republican River Basin and the RRWCD shall report annually or at other reasonable times to the State Engineer the readings of such measuring devices and the amounts pumped from the Compact Compliance Wells.
3. Diversions from the Compact Compliance Wells shall be limited to no more than 2,500 acre feet per year per well.
4. Discharges of groundwater to the North Fork of the Republican River from the Colorado Compact Compliance Pipeline will be measured at an outlet structure located approximately one-half mile from the Colorado-Nebraska State Line.
5. Banking of groundwater shall be permitted in accordance with the Rules and Regulations of the Colorado Ground Water Commission for the Management and Control of Designated Ground Water, as amended, but diversions from the Compact Compliance Wells shall be limited to the amount necessary to offset stream depletions in order to comply with Colorado's Allocations under the Republican River Compact in accordance with the terms of the Stipulation between the States of Colorado and Nebraska, as set forth in the Joint Notice of Stipulation between the States of Colorado and Nebraska submitted to Arbitrator Martha O. Pagel on May 17, 2010 ("Joint Notice of Stipulation") (RRWCD Exh. 8).
6. Deliveries to the North Fork of the Republican River from the Colorado Compact Compliance Pipeline will be in compliance with the terms of the Stipulation between the States of Colorado and Nebraska, as set forth in the Joint Notice of Stipulation.

31. Additionally, the Board anticipates that when the Commission issues its approval of the change of use for the ground water rights to be used in the Pipeline project and export, that all of the typical terms and conditions that are usually included in such approvals pursuant to Commission Rule 7 will be included in this one, and specifically including those administrative terms and conditions for which the District typically plays a role in monitoring and administration of the change of use approval. The Board finds that such terms and conditions

should be included in that approval, and should also be incorporated into this Decision, but because they have not yet been issued, the Board cannot review them at this time. Therefore, the Board retains jurisdiction over this Decision for the purpose of reviewing those terms and conditions for adequacy and for the purpose of adding any additional terms and conditions that the Board determines to be needed, but that are not adequately addressed in the Commission's change of use approval. The retained jurisdiction described in this paragraph may be exercised by the Board only if it determines that the terms and conditions contained in the Commission approval of the change of use for the ground water rights to be used in the Pipeline project and export are not adequate, and need to be supplemented by the District. If the Board makes this decision, it will give written notice to the parties of the additional terms and conditions that it believes are needed, and give the RRWCD 60 days to submit a response. The Board will consider any request for an additional hearing, and determine if an additional hearing is needed, or whether the existing record is adequate for a decision about additional terms and conditions.

32. The Board also adds the term and condition of requiring the RRWCD to submit to the District by April 1 of each year, a copy of the annual projections of the amount and timing for Pipeline project deliveries that are prepared in accordance with the stipulation with Nebraska. The RRWCD indicated during the hearing that this term and condition would be acceptable. See RRWCD Exh. 14, at page 6.

33. The RRWCD proposed the following supplemental terms and conditions for the approval of the export of up to 500 acre feet of ground water to be pumped from Wells A-2 through A-8 and B-5 (the "Wells"), as shown on Figure 1 attached to RRWCD Exh. 4, to test the Pipeline in 2012 and delivery of that water into the North Fork of the Republican River near the Colorado/Nebraska State Line. These are found by the Board to be reasonable and appropriate, and they are incorporated into this Decision as binding terms and conditions on the requested export of 500 acre feet to test the Pipeline in 2012.

1. In calendar year 2012, no diversions of ground water shall be made from Well A-2, except as needed by the RRWCD to test the Pipeline, and the fields described in paragraph 2 below will be fallowed in 2012.
2. During 2012, the following fields that are permitted under Permit No. 18015-FP to be irrigated with Well A-2 shall not be irrigated: Fields 6-17, 6-18, and 6-19 (totaling approximately 329 acres), as shown on Figure 1, which is attached as Exhibit B and incorporated in these Findings.
3. In calendar year 2012, diversions of groundwater may be made from Wells A-3 through A-8 and B-5 for irrigation and to test the Pipeline, subject to the supplemental terms and conditions herein. Groundwater diversions from the Wells shall be measured by totalizing flow meters and the RRWCD shall record and report to the State Engineer the readings from such meters before and after the Wells are pumped to test the Pipeline and the amounts pumped from the Wells to test the Pipeline.
4. Discharges of groundwater to the North Fork of the Republican River from the Colorado Compact Compliance Pipeline shall be measured at an

outlet structure located approximately one-half mile from the Colorado-Nebraska State Line.

5. No more than 500 acre feet of groundwater in total shall be diverted from the Wells and delivered into the North Fork of the Republican River near the Colorado/Nebraska State Line to test the Pipeline in 2012.
6. The approval by the Sandhills GWMD to allow the RRWCD to divert up to 500 acre-feet of groundwater from the Wells to test the Pipeline in 2012, in accordance with the terms and conditions provided herein, shall not impair the right to use the water rights in the future for irrigation.
7. The approval of the Sandhills GWMD for the diversion of up to 500 acre feet of groundwater from the Wells and the export of that groundwater for delivery into the North Fork of the Republican River near the Colorado/Nebraska State Line to test the Pipeline in 2012 shall not be a precedent for the approval of any other export of groundwater from the Sandhills GWMD.

34. Additionally, the Board anticipates that the Commission will issue its approval of the change of use for the ground water rights to be used in the Pipeline project and export before any water is used for Pipeline testing, and that all of the typical terms and conditions that are usually included in such approvals pursuant to Commission Rule 7 will be included in this one, and specifically including those administrative terms and conditions for which the District typically plays a role in monitoring and administration of the change of use approval. The Board finds that such terms and conditions should be included in that approval, and should also be incorporated into this Decision, but because they have not yet been issued, the Board cannot review them at this time. Therefore, the Board retains jurisdiction over this Decision for the purpose of reviewing those terms and conditions for adequacy and for the purpose of adding any additional terms and conditions that the Board determines to be needed, but that are not adequately addressed in the Commission's change of use approval. The retained jurisdiction described in this paragraph may be exercised by the Board only if it determines that the terms and conditions contained in the Commission approval of the change of use for the ground water rights to be used in the Pipeline project and export are not adequate, and need to be supplemented by the District. If the Board makes this decision, it will give written notice to the parties of the additional terms and conditions that it believes are needed, and give the RRWCD 60 days to submit a response. The Board will consider any request for an additional hearing, and determine if an additional hearing is needed, or whether the existing record is adequate for a decision about additional terms and conditions.

35. At the hearing, those who had submitted written comments or sought party status were given an opportunity to make any further statement to the Board; none objected to the export application or requested to comment further. The Central Yuma Groundwater Management District, which had sought party status, submitted a letter in support of the export application, which was marked as Exh. 8-A and accepted as part of the record.



36. The Board then allowed public comment on the export application. The only member of the public who spoke was Sue Jarrett. She stated that Mr. Rex Tracy had signed up to give public comment and asked that she be allowed to submit a written statement on his behalf opposing the export application on the basis that it will be of no benefit, which was marked and admitted as Exh. 18. Ms. Jarrett objected to the export application because she questioned the wisdom of continuing to pump ground water from the Ogallala aquifer to maintain the existing agricultural economy and the wisdom of pumping ground water into a surface stream. She submitted a written statement, which was marked and admitted as Exh. 19.

37. At the conclusion of the hearing, the RRWCD requested that the Board approve the export application to allow the RRWCD to export up to 500 acre-feet of ground water in 2012 to test the Pipeline based on the supplemental terms and conditions the RRWCD had submitted (RRWCD Exh. 4), which includes the condition that approval is not a precedent for the approval of any other export of ground water from the District.

38. The RRWCD also requested that the Board approve the export application based on the terms and conditions the RRWCD had submitted (RRWCD Exh. 3) if Colorado receives 100% credit for Pipeline deliveries that are consistent with the stipulation with Nebraska. The terms and conditions include the condition that Pipeline deliveries be made in compliance with the terms of the stipulation with Nebraska.

39. Lastly, the RRWCD asked that the Board reserve consideration of the export application until Colorado has completed discussions with Kansas on the credit Colorado will receive for Pipeline deliveries in the event the States can agree to a percentage credit for Pipeline deliveries that is less than 100%. While the RRWCD believes Colorado should receive 100% credit for Pipeline deliveries that are consistent with the stipulation with Nebraska, the RRWCD recognizes that the Arbitrator recommended 90% credit to address Kansas' concern that Pipeline deliveries would result in "negative pumping impacts" to the detriment of Kansas.

40. The evidence presented at the hearing demonstrated that the Pipeline project is needed for Colorado to comply with the Compact at current levels of well pumping in the Republican River basin in Colorado. The evidence further showed that even shutting down all wells in the basin in Colorado would not bring Colorado into Compact compliance for decades. The FSS allows for the use of wells to offset stream depletions, and the RRWCD Board of Directors carefully evaluated the feasibility of a Pipeline project before it proceeded with the project.

### CONCLUSIONS OF LAW

41. The Board has authority to prohibit, after affording an opportunity for hearing before the Board and presentation of evidence, the use of ground water outside the boundaries of the District where such use materially affects the rights acquired by permit by any owner or operator of land within the District, and may, in the reasonable discretion of the Board, condition approval to use ground water outside the boundaries of the District where such conditions are necessary to prevent such use from materially affecting the rights acquired by permit by any owner or operator of land within the District. C.R.S. Section 37-90-137(2)(f).

42. The export application in this matter was filed with the District pursuant to its Rules and the Agreement between the District and the RRWCD. The Board has jurisdiction to make a decision on the export application pursuant to District Rule 3 and C.R.S. Section 37-90-137(2)(f).

43. Timely and adequate notice of the export application and the hearing on the export application was published in accordance with C.R.S. Section 37-90-112(1).

44. The RRWCD has complied with all procedural requirements of the District's Rules and the Agreement between the District and the RRWCD.

### DECISION BY THE BOARD

NOW, THEREFORE, it is hereby the decision of the Board of Directors of the District as follows:

45. The Board approves the export of up to 500 acre-feet of ground water in 2012 to test the Pipeline, subject to the supplemental terms and conditions and retained jurisdiction set forth in paragraphs 33 and 34 above.

46. The Board also approves the export of ground water under the ground water rights for the 61 permits located in the District specified in Table 3 of the engineering report attached as Exhibit A and delivery of the ground water to the North Fork of the Republican River for the sole purpose of offsetting stream depletions that reach the Republican River after the date of this decision in order to comply with Colorado's allocations under the Compact and the FSS, on the condition that Colorado receives 100% credit for such deliveries that are in compliance with the stipulation between Colorado and Nebraska, and subject to the other terms and conditions and retained jurisdiction set forth herein.

47. However, the Board retains jurisdiction for further consideration of the export application until Colorado has completed discussions with Kansas on the credit that Colorado will receive for Pipeline deliveries under the Compact in the event the States can agree to a percentage credit for Pipeline deliveries that is less than 100% or Colorado again initiates non-binding arbitration to resolve the dispute over the credit that Colorado will receive and that process results in a credit of less than 100%. The retained jurisdiction described in this paragraph may be exercised upon the request of any party made by filing a written request with the District asking that further consideration of the export be given by the District, and may also be exercised by the Board itself, by giving notice to all parties that further consideration of the export will be given by the District. Any written request filed by a party other than the District shall specify the terms and conditions that the person seeks to have the Board review and shall specify any modification to the terms and conditions the person seeks to have made. A notice given by the Board that the District will initiate additional review under this retained jurisdiction will state the reasons why the additional review is sought. The RRWCD shall have the opportunity to submit a response within 60 days. The Board shall hold a hearing and allow presentation of evidence before making a modification to the terms and conditions under this paragraph.

48. The approval of the export of ground water as provided in paragraph 46 shall also be subject to the retained jurisdiction of the Board to review the adequacy of the other terms and conditions set forth herein and the necessity for additional terms and conditions on the export, no earlier than five years after the first Pipeline project deliveries are made consistent with this approval and no more often than every five years thereafter. RRWCD shall give notice to the District within 60 days after the first deliveries are made so that the initial five year date can be determined with certainty. Any person seeking to invoke the retained jurisdiction of the Board described in this paragraph shall file a request in writing and shall specify the terms and conditions that the person seeks to have the Board review and shall specify any modification to the terms and conditions the person seeks to have made. The Board itself may also initiate additional review under this paragraph by giving the parties written notice that the District will initiate additional review and stating the reasons why the additional review is sought. The RRWCD shall have the opportunity to submit a response within 60 days. Any person other than the District requesting to invoke the retained jurisdiction shall have the burden to show why any modification to the terms and conditions is necessary if the RRWCD disagrees with the proposed modification. The Board shall hold a hearing and allow presentation of evidence before making a modification to the terms and conditions under this paragraph.

49. Subject to the terms and conditions and the retained jurisdiction provisions set forth herein, which the District thinks are matters for potential future consideration and resolution, this Decision is intended by the District to be a final decision on all of the matters currently pending in this proceeding. More specifically, the Commission should regard this Decision as final pursuant to Commission Rule 7.7.4.1.

Dated: March 12, 2012.

BY THE BOARD OF DIRECTORS



\_\_\_\_\_  
President

**Table 3  
Rights to Designated Groundwater**

Field Number	Permit #1	Permit #2	Acreage in Change of Use Form	Colorado Groundwater Commission Historical Consumptive Use (ac-ft/yr)	Corrected Historical Consumptive Use (ac-ft/yr)	Maximum Annual Volume of Appropriation (ac-ft)	Groundwater Commission Preliminary Approval Date
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1-1	12967-FP	16920-FP	194	345	333	493	3/19/2008
1-2	14403-FP		181	279	279	458	12/12/2008
1-3	14019-FP		133	217	206	338	3/19/2008
1-4	14018-FP		164	252	234	418	3/19/2008
1-5	19372-FP		136	218	211	340	3/19/2008
1-6 and 1-7	18780-FP		127	192	192	345	3/19/2008
<b>Subtotal</b>			<b>935</b>	<b>1,502</b>	<b>1,455</b>	<b>2,392</b>	
2-1	14396-FP		130	192	180	325	3/19/2008
2-2	13858-FP		133	228	206	333	3/19/2008
2-3	13859-FP	16069-FP	188	270	260	473	3/19/2008
2-4	13857-FP		147	229	217	365	3/19/2008
2-5	14398-FP		144	240	230	360	3/19/2008
2-6	13856-FP	16067-FP	164	249	249	413	3/19/2008
<b>Subtotal</b>			<b>906</b>	<b>1,408</b>	<b>1,342</b>	<b>2,269</b>	
3-1	14397-FP		127	192	184	315	3/19/2008
3-2	14027-FP		153	251	237	385	3/19/2008
3-3	14022-FP		180	289	255	450	3/19/2008
3-4	14023-FP		133	219	197	333	3/19/2008
3-5	14600-FP		124	197	187	315	3/19/2008
3-6	15285-FP		98	161	140	243	3/19/2008
3-7	20896-FP		107	169	168	265	3/19/2008
<b>Subtotal</b>			<b>922</b>	<b>1,479</b>	<b>1,369</b>	<b>2,306</b>	
4-1	13513-FP	16074-FP	186	302	257	468	3/19/2008
4-2	14028-FP		146	218	202	365	3/19/2008
4-3	14753-FP		185	310	267	463	3/19/2008
4-4	13522-FP		135	204	189	343	3/19/2008
4-5	14024-FP		93	141	129	235	3/19/2008
4-6	13509-FP	16075-FP	179	284	273	448	3/19/2008
4-7	13511-FP		123	192	173	310	3/19/2008
4-8	18781-FP		128	216	206	320	3/19/2008
4-9	21476-FP		88	144	139	220	3/19/2008
5-1	18783-FP		173	273	273	400	3/19/2008
<b>Subtotal</b>			<b>1,437</b>	<b>2,285</b>	<b>2,108</b>	<b>3,572</b>	
6-0	19004-FP		82	141	141	700	12/12/2008
6-1	19005-FP		124	178	174	335	3/19/2008
6-2	18966-FP		94	172	172	900	3/19/2008
6-3	18018-FP		148	230	218	400	3/19/2008
6-4,6-5	18017-FP	19001-FP	245	361	353	800	3/19/2008
6-6, 6-7	23222-FP		148	230	230	200	12/12/2008
6-8	18019-FP		107	173	163	400	3/19/2008
6-9, 6-10	18014-FP		176	259	247	400	3/19/2008
6-11,12,13,14	18013-FP		250	350	350	400	3/19/2008
6-15, 6-16	18011-FP		244	431	421	900	3/19/2008
6-17, 6-18, 6-19	18015-FP		329	549	497	900	3/19/2008
6-20, 6-21	18012-FP	19000-FP	208	322	317	582	3/19/2008
<b>Subtotal</b>			<b>2,155</b>	<b>3,397</b>	<b>3,283</b>	<b>6,917</b>	
7-1	13813-FP	16923-FP	126	206	203	400	3/19/2008
7-2, 7-2A	13814-FP		219	334	323	480	3/19/2008
7-3, 7-3a	13815-FP		197	291	311	480	3/19/2008
7-13, 7-14	14718-FP		358	526	526	800	3/19/2008

**EXHIBIT A – to  
SHGWMD Export Decision**

Field Number	Permit #1	Permit #2	Acreage in Change of Use Form	Colorado Groundwater Commission Historical Consumptive Use (ac-ft/yr)	Corrected Historical Consumptive Use (ac-ft/yr)	Maximum Annual Volume of Appropriation (ac-ft)	Groundwater Commission Preliminary Approval Date
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
7-15, 7-16	14121-FP		285	437	420	800	3/19/2008
7-17, 7-18	14719-FP		263	455	424	800	3/19/2008
7-19 <sup>a)</sup>	14122-FP		131	215	204	400	3/19/2008
7-21, 7-21A	12589-FP		251	376	372	560	3/19/2008
<b>Subtotal</b>			<b>1,831</b>	<b>2,840</b>	<b>2,782</b>	<b>4,720</b>	
Wiley	4319-FP	4922-FP	65	75	75	125	12/12/2008
Wilder1	20198-FP		124	194	194	325	12/12/2008
Wilder2	20196-FP		163	249	249	450	12/12/2008
<b>Subtotal</b>			<b>352</b>	<b>518</b>	<b>518</b>	<b>900</b>	
<b>Total Submitted for SGWMD Approval</b>			<b>8,537</b>	<b>13,430</b>	<b>12,858</b>	<b>23,076</b>	

<b>One Parcel that is not included with the SGMD Application but this Parcel is included in CGWC review and preliminary Approval and is shown here for Comparison Purposes. The well that irrigates this parcel is located in the Central Yuma Groundwater Management District.</b>							
7-23	12567-FP		126	201	201	315	3/19/2008
<b>Total with Parcel 7-23</b>			<b>8,664</b>	<b>13,630</b>	<b>13,059</b>	<b>23,391</b>	

a) Permit allows for irrigation of parcels 7-19 and 7-20. Only the portion of permit historically

**Explanation of Columns**

- (1) Field Number as shown on Figure 4.
- (2) Final permit for the Northern High Plains Designated Ground Water Basin. See permit for well location, priority date, and other information, including any allowable commingling with other permits.
- (3) Second permit associated with the permit shown in column 2. Typically, these are permits for additional acreage, but see permit for details.
- (4) Average acreage reported in change of use form submitted to the Colorado Groundwater Commission
- (5) Historical consumptive use determined from irrigated acreage, crop records and power records. For permits in February 25, 2008 application the values are from the March 19, 2008 DWR Publication letter. For permits in October 22, 2008 submittal the values are from the December 8, 2008 DWR Publication letter.
- (6) In April of 2008 Marc Groff, a consultant for the State of Nebraska, identified an error in the consumptive use calculations made in the February 25, 2008 submittal to the Colorado Groundwater Commission. This error was documented by the State of Colorado in a memorandum provided to the State of Nebraska and the State of Kansas entitled "Revisions to Crop Irrigation Requirement Use Estimates included in March 2008 RRCA Submittal for the Republican River Compact Compliance" dated May 18, 2008. This error was corrected and was not included in the October 22, 2008 submittal. The Consumptive Use values shown in Column 7 are the corrected February 25, 2008 values and the October 22, 2008
- (7) Amount of annual permitted withdrawal determined from well permit. This information is used to set the water banking limitations by the Colorado Groundwater Commission.



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**REPUBLICAN RIVER COMPACT ARBITRATION**

**COLORADO'S COMPACT COMPLIANCE PIPELINE ISSUE  
AND  
NEBRASKA'S CREDITING ISSUE**

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**BEFORE MS. MARTHA PAGEL, ARBITRATOR**

**Pursuant to Section VII, Final Settlement Stipulation  
(December 15, 2002)**

---

**JOINT NOTICE OF STIPULATION**

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The States of Colorado and Nebraska (the "Stipulating States") hereby notify the Arbitrator and the State of Kansas that the Stipulating States have resolved, as between the Stipulating States, all Issues presented in this Arbitration by both Nebraska and Colorado. In furtherance of the Stipulation, the States hereby inform the Arbitrator as follows:

1. Nebraska informs the Arbitrator that she supports Colorado's Compliance Pipeline (subject to the terms of the Stipulating States' agreement);
2. Nebraska withdraws the Additional Issues identified in her September 4, 2009 correspondence concerning the Colorado Compliance Pipeline (attached to the Colorado Compliance Pipeline Arbitration Agreement as Exhibit C);
3. Colorado informs the Arbitrator that she supports Nebraska's proposed resolution of the Nebraska Crediting Issue;
4. The States of Colorado and Nebraska have agreed to the following terms as part of the Stipulating States' agreement: Colorado and the RRWCD WAE shall deliver water to the North Fork of the Republican River to offset stream depletions in order to comply with Colorado's Compact Allocations as agreed upon by the two States not later than December 31 of the year preceding scheduled deliveries. Colorado and the RRWCD WAE together shall consult with Nebraska as needed to coordinate the timing and volume of deliveries to the North Fork of the Republican River. To the maximum extent possible, Colorado and the RRWCD WAE will make such deliveries per Nebraska's request consistent with the following delivery schedule:



- a. For each year, except as provided in paragraph b, Colorado shall begin deliveries on January 1 and shall make the minimum annual delivery of 4,000 acre-feet provided for in the Colorado Resolution during the months of January through March. Colorado will calculate and provide notice of the Projected Delivery, as defined in the Colorado Resolution, to the Kansas and Nebraska RRCA Members by April 1 as provided in the Colorado Resolution. Unless Colorado determines by April 1 that it will not be able to deliver any remaining Projected Delivery in the months of October through December, Colorado shall stop deliveries at the end of March. If Colorado anticipates that deliveries in the months of November and December will not be sufficient for Compact compliance, Colorado shall maximize deliveries first in January, then sequentially in the months of February, March, and April. Only if there is reason to believe that additional deliveries in the months of October through December as described below in this paragraph will not be sufficient for Compact compliance will deliveries extend into the month of May. By September 1<sup>st</sup>, Colorado will gather provisional hydrologic data for the months of January through August of the year and shall estimate the amount of deliveries needed for Compact compliance for the remainder of the year after accounting for the deliveries earlier in the year. Colorado shall then maximize any

additional water deliveries first in the month of December, then sequentially in November, and October.

- b. For the first year the Pipeline becomes operational, if the Pipeline becomes operational after January 1 and Colorado cannot make the minimum annual delivery of 4,000 acre-feet provided for in the Colorado Resolution during the months of January through March, Colorado and the RRWCD WAE together shall consult with Nebraska as needed to coordinate the timing and volume of deliveries to the North Fork of the Republican River and shall maximize deliveries prior to March 31 and in the months of October through December.
- c. If the minimum annual delivery of 4,000 acre-feet provided for in the Colorado Resolution is modified by arbitrator's decision, RRCA action, or United States Supreme Court decision or by agreement of the States, the States agree to work together in good faith to agree upon a delivery schedule that, to the maximum extent possible, will make such deliveries per Nebraska's request consistent with the delivery schedule provided in paragraph a. In the event the States are unable to agree upon a delivery schedule pursuant to this Stipulation, and the dispute is not resolved, the States shall proceed in good faith to submit the dispute to mediation. Mediation is a process in which the parties meet with an impartial person who helps to resolve the dispute informally and confidentially. The parties to the dispute must agree

before any settlement is binding. The States will jointly appoint an acceptable mediator and will share equally in the cost of such mediation. The mediation, unless otherwise agreed, shall terminate in the event the dispute cannot be resolved within 30 calendar days of the date written notice requesting mediation is delivered by one State's RRCA Member to the other State's RRCA Member.

d. Unless otherwise requested by Nebraska, deliveries during the Irrigation Season, defined as being the months June through September, shall be avoided to the maximum extent possible and shall only be made as a last resort in order to satisfy the water deliveries called for under the Colorado Resolution; and,


5. The Stipulating States expressly reserve their right to prosecute their respective positions in this Arbitration to the fullest extent against all challenges by the State of Kansas, and nothing contained herein shall limit the Stipulating States' ability to defend any such challenge and participate in this Arbitration as set forth in Section VII of the Final Settlement Stipulation.

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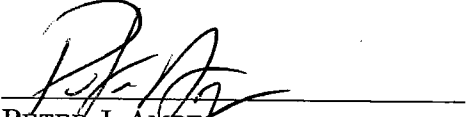
JON BRUNING  
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---

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# Republican River Compact Administration

## ACCOUNTING PROCEDURES

AND

## REPORTING REQUIREMENTS

Revised July 27, 2005

Updated November 7, 2008

Colorado Proposal  
Updated April 5, 2013

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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, ~~Augmentation Water Supply Credit~~ CNF Augmentation 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;

**Augmentation Plan:** a detailed program used by a State to offset stream depletions in order to comply with its Compact Allocations. An Augmentation Plan shall be approved by the RRCA prior to implementation in accordance with Subsection III.B.1.k of the Stipulation;

**Augmentation Water Supply:** the water supply developed through the acquisition or construction of wells for the sole purpose of offsetting stream depletions in order to comply with a State's Compact Allocations in conformance with an Augmentation Plan;

**Augmentation Water Supply Credit**~~CNF Augmentation Water Supply Credit~~: the amount of water measured and discharged to the North Fork of the Republican River by the Colorado CCP stream flow of a Designated Drainage Basin due to the acquisition or construction of wells for the purpose of offsetting stream depletions to comply with a States' Compact Allocation in conformance with an Augmentation Plan. The ~~Augmentation Water Supply Credit~~ CNF Augmentation Water Supply Credit of a State Colorado shall not be included in the Virgin Water Supply in the Designated Drainage Basin and shall be counted as a credit/offset against the Computed Beneficial Consumptive Use of water allocated to ~~that State~~ Colorado;

**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 Flow:** 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
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Sub-basin VWS	=	Gage + All CBCU <del>-CNFAWS</del> + $\Delta S$ - IWS
Main Stem VWS	=	Hardy Gage - $\Sigma$ Sub-basin gages + All CBCU in the Main Stem + $\Delta S$ - IWS
CWS	=	VWS - $\Delta S$ - FF
Allocation for each State in each Sub-basin And Main Stem	=	CWS x %
State's Allocation	=	$\Sigma$ Allocations for Each State
State's CBCU	=	$\Sigma$ State's CBCUs in each Sub-basin and Main Stem

Abbreviations:

~~CNFAWS = Augmentation Water Supply Credit~~ Colorado North Fork (CNF) Augmentation Water Supply Credit

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

$\Delta S$  = 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 ~~and any Augmentation Water Supply Credit~~ CNF Augmentation 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.

**4. Augmentation Water Supply Credit**  
**CNF Augmentation Water Supply Credit:**  
**The amount of Augmentation Water Supply Credit**

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Supply Credit shall be the quantity of water delivered to the North Fork of the Republican River stream flow of a Designated Drainage Basin and shall be measured and subtracted from the Gaged Flow of the Designated Drainage Basin to calculate the Annual Virgin Water Supply. The ~~Augmentation Water Supply Credit~~CNF Augmentation Water Supply Credit of a ~~State~~Colorado shall not be included in the Annual Virgin Water Supply and shall be counted as a credit/offset against the Computed Beneficial Consumptive Use of water allocated to ~~that~~ ~~State~~Colorado.

## **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 flow<sup>1</sup> 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 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

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

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 ~~and the Augmentation Water Supply Credit~~<sup>CNF</sup> Augmentation 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.

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#### **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, ~~and Augmentation Water Supply Credit~~ CNF Augmentation 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 and Augmentation Water Supply Credit ~~CNF Augmentation 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 ~~or Augmentation Water Supply Credit~~ CNF Augmentation 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, ~~the and-Imported~~ Water Supply Credit, ~~and the Augmentation~~ [CNF Augmentation Water Supply Credit](#) that a State may use to offset Computed Beneficial Consumptive Use in that year. The resulting annual and average values will be calculated as displayed in Tables 5 A-C and E.



If Nebraska is implementing an Alternative Water-Short-Year Administration Plan, data to determine Compact compliance will be shown in Table 5D. Nebraska's compliance with the Compact will be determined in the same manner as Nebraska's Above Guide Rock compliance except that compliance will be based on a three-year running average of the current year and previous two year calculations. In addition, Table 5 D. will display the sum of the previous two-year difference in Allocations above Guide Rock and Computed Beneficial Consumptive Uses above Guide Rock minus any Imported Water Credits and compare the result with the Alternative Water-Short-Year Administration Plan's expected decrease in Computed Beneficial Consumptive Use above Guide Rock. Nebraska will be within compliance with the Compact as long as the three-year running average difference in Column 8 is positive and the sum of the previous year and current year deficits above Guide Rock are not greater than the expected decrease in Computed Beneficial Consumptive Use under the plan.

#### **IV. Specific Formulas**

##### **A. Computed Beneficial Consumptive Use**

###### **1. Computed Beneficial Consumptive Use of Groundwater:**

The Computed Beneficial Consumptive Use caused by groundwater diversion shall be determined by the RRCA Groundwater Model as described in Subsection III.D.1.

###### **2. Computed Beneficial Consumptive Use of Surface Water:**

The Computed Beneficial Consumptive Use of surface water shall be calculated as follows:

###### **a) Non-Federal Canals**

Computed Beneficial Consumptive Use from diversions by non- federal canals shall be 60 percent of the diversion; the return flow shall be 40 percent of the diversion

###### **b) Individual Surface Water Pumps**

Computed Beneficial Consumptive Use from small individual surface water pumps shall be 75 percent of the diversion; return flows will be 25 percent of the diversion unless a state provides data on the amount of

different system types in a Sub-basin, in which case the following percentages will be used for each system type:

Gravity Flow.	30%
Center Pivot	17%
LEPA	10%

c) Federal Canals

Computed Beneficial Consumptive Use of diversions by Federal canals will be calculated as shown in Attachment 7. For each Bureau of Reclamation Canal the field deliveries shall be subtracted from the diversion from the river to determine the canal losses. The field delivery shall be multiplied by one minus an average system efficiency for the district to determine the loss of water from the field. Eighty-two percent of the sum of the field loss plus the canal loss shall be considered to be the return flow from the canal diversion. 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
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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:

~~$\frac{AWSCNFASW}{AWS} = \frac{\text{Augmentation Water Supply Credit}}{\text{CNF Augmentation Water Supply Credit}}$~~

- 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
- $\Delta S$  = 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 <sup>2</sup>

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

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

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

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

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

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

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

$$\text{Allocation Colorado} = 0.224 \times \text{CWS}$$

$$\text{Allocation Nebraska} = 0.246 \times \text{CWS}$$

$$\text{Unallocated} = 0.53 \times \text{CWS}$$

### 4. Arikaree River <sub>2</sub>

<sup>2</sup> 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.

$$\begin{aligned}
 \text{CBCU Colorado} &= 0.6 \times Dc + \% \times Pc + 0.5 \times M\&Ic + EvNFRc + GWc \\
 \text{CBCU Kansas} &= 0.6 \times Dk + \% \times Pk + 0.5 \times M\&Ik + EvNFRk + GWk \\
 \text{CBCU Nebraska} &= 0.6 \times Dn + \% \times Pn + 0.5 \times M\&In + EvNFRn + GWn \\
 \text{VWS} &= \text{Arikaree Gage at Haigler Stn. No. 06821500} + \text{CBCUc} + \\
 &\quad \text{CBCUk} + \text{CBCUn} - \text{IWS} \\
 \text{CWS} &= \text{VWS} - \text{FF} \\
 \text{Allocation Colorado} &= 0.785 \times \text{CWS} \\
 \text{Allocation Kansas} &= 0.051 \times \text{CWS} \\
 \text{Allocation Nebraska} &= 0.168 \times \text{CWS} \\
 \text{Unallocated} &= -0.004 \times \text{CWS}
 \end{aligned}$$

**5. Buffalo Creek**

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

**6. Rock Creek**

$$\begin{aligned}
 \text{CBCU Colorado} &= GWc \\
 \text{CBCU Kansas} &= GWk
 \end{aligned}$$



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

VWS = Rock Creek at Parks Gage Stn. No. 06824000 + CBCUc + CBCUk + CBCUn – IWS

CWS = VWS - FF

Allocation Nebraska =  $0.400 \times CWS$

Unallocated =  $0.600 \times CWS$

**7. South Fork Republican River**

CBCU Colorado =  $0.6 \times \text{Hale Ditch Diversion} + 0.6 \times Dc + \% \times Pc + 0.5 \times M\&Ic + EvNFRc + \text{Bonny Reservoir Ev} + GWc$

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 = South Fork Republican River near Benkelman Gage Stn. No. 06827500 + CBCUc + CBCUk + CBCUn +  $\Delta S$  Bonny Reservoir – IWS

CWS = VWS -  $\Delta S$  Bonny Reservoir - FF

Allocation Colorado =  $0.444 \times CWS$

Allocation Kansas =  $0.402 \times CWS$

Allocation Nebraska =  $0.014 \times CWS$

Unallocated =  $0.140 \times CWS$

**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 + ΔS Enders Reservoir – IWS

Note: 17% of the Culbertson Diversion RF and 100% of the Culbertson Extension RF return to the Main Stem

CWS = VWS - ΔS Enders Reservoir – FF

Allocation Nebraska = 0.536 x CWS

Unallocated = 0.464 x CWS

**9. Driftwood Creek**

CBCU Colorado = GWc

CBCU Kansas = 0.6 x Dk + % x Pk + 0.5 x M&Ik + EvNFRk + GWk

CBCU Nebraska = 0.6 x Dn + % x Pn + 0.5 x M&In + EvNFRn + GWn

VWS = Driftwood Creek near McCook Gage Stn. No. 06836500 + CBCUc + CBCUk + CBCUn – 0.24 x Meeker Driftwood Canal RF - IWS

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

CWS = VWS – FF

Allocation Kansas = 0.069 x CWS

Allocation Nebraska = 0.164 x CWS

Unallocated = 0.767 x CWS

**10. Red Willow Creek in Nebraska**

CBCU Colorado = **GWc**

CBCU Kansas = **GWk**

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

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 =  $\text{Red Willow Creek near Red Willow Gage Stn. No. 06838000} + \text{CBCUc} + \text{CBCUk} + \text{CBCUn} + 0.9 \times \text{Red Willow Canal CBCU} + 0.9 \times \text{Hugh Butler Lake Ev} + 0.9 \times \text{Red Willow Canal RF} + \Delta\text{S Hugh Butler Lake} - \text{IWS}$

Note: 90% of the Red Willow Canal RF returns to the Main Stem

CWS =  $\text{VWS} - \Delta\text{S Hugh Butler Lake} - \text{FF}$

Allocation Nebraska =  $0.192 \times \text{CWS}$

Unallocated =  $0.808 \times \text{CWS}$

**11. Medicine Creek**

CBCU Colorado = **GWc**

CBCU Kansas = **GWk**

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

Note: Harry Strunk Lake Ev charged to Nebraska's CBCU in the Main Stem.

CU from Harry Strunk releases in the Cambridge Canal is charged to the Main stem (no adjustment to the VWS formula is needed as this water shows up in the Medicine Creek gage).

VWS = Medicine Creek below Harry Strunk Lake Gage Stn. No. 06842500 + CBCUc + CBCUk + CBCUn - 0.6 x Dn below gage - % x Pn below gage - 0.5 \* M&In below gage - EvNFRn below gage + Harry Strunk Lake Ev + ΔS Harry Strunk Lake - IWS

Note: The CBCU surface water terms for Nebraska which occur below the gage are added in the VWS for the Main Stem

CWS = VWS - ΔS Harry Strunk Lake - FF

Allocation Nebraska = 0.091 x CWS

Unallocated = 0.909 x CWS

**12. Beaver Creek**

CBCU Colorado = 0.6 x Dc + % x Pc + 0.5 x M&Ic + EvNFRc + GWc

CBCU Kansas = 0.6 x Dk + % x Pk + 0.5 x M&Ik + EvNFRk + GWk

CBCU Nebraska = 0.6 x Dn above and below gage + % x Pn above and below gage + 0.5 x M&In above and below gage + EvNFRn above and below gage + GWn

VWS = Beaver Creek near Beaver City gage Stn. No. 06847000 + BCUC + CBCUK + CBCUN - 0.6 x Dn below gage - % x Pn below gage - 0.5 \* M&In below gage - EvNFRn below gage - IWS

Note: The CBCU surface water terms for Nebraska which occur below the gage are added in the VWS for the Main Stem

CWS = VWS – FF  
 Allocation Colorado = 0.200 x CWS  
 Allocation Kansas = 0.388 x CWS  
 Allocation Nebraska = 0.406 x CWS  
 Unallocated = 0.006 x CWS

**13. Sappa Creek**

CBCU Colorado = **GWc**  
 CBCU Kansas = **0.6 x Dk** + % x Pk + 0.5 x M&Ik + EvNFRk + GWk  
 CBCU Nebraska = **0.6 x Dn above and below gage** + % x Pn above and below gage + 0.5 x M&In above and below gage + EvNFRn above and below gage + GWn  
 VWS = Sappa Creek near Stamford gage Stn. No. 06847500 – Beaver Creek near Beaver City gage Stn. No. 06847000 + CBCUc + CBCUk + CBCUn – 0.6 x Dn below gage - % x Pn below gage – 0.5 \* M&In below gage - EvNFRn below gage – IWS

Note: The CBCU surface water terms for Nebraska which occur below the gage are added in the VWS for the Main Stem

CWS = VWS - FF  
 Allocation Kansas = 0.411 x CWS  
 Allocation Nebraska = 0.411 x CWS  
 Unallocated = 0.178 x CWS

**14. Prairie Dog Creek**

CBCU Colorado	= <b>GWc</b>
CBCU Kansas	= Almena Canal Diversion x (1-%BRF) + <b>0.6 x Dk</b> + % x Pk + 0.5 x M&Ik + EvNFRk + Keith Sebelius Lake Ev + GWk
CBCU Nebraska	= <b>0.6 x Dn below gage</b> + % 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 + CBCUc + CBCUk + CBCUn - <b>0.6 x Dn below gage</b> - % x Pn below gage - 0.5 x M&In below gage - EvNFRn below gage + ΔS Keith Sebelius Lake – IWS
	Note: The CBCU surface water terms for Nebraska which occur below the gage are added in the VWS for the Main Stem
CWS	= VWS- ΔS Keith Sebelius Lake - FF
Allocation Kansas	= 0.457 x CSW
Allocation Nebraska	= 0.076 x CWS
Unallocated	= 0.467 x CWS

**15. The North Fork of the Republican River in Nebraska and the Main Stem of the Republican River between the junction of the North Fork and the Arikaree River and the Republican River near Hardy**

CBCU Colorado	= GWc
CBCU Kansas	= (Deliveries from the Courtland Canal to Kansas above Lovewell) x (1-%BRF) + Amount of transportation loss of Courtland Canal deliveries to Lovewell that does not return to the river, charged to Kansas + (Diversions of Republican River water from Lovewell Reservoir by the Courtland Canal below Lovewell) x (1- %BRF) + <b>0.6 x Dk</b>

+ % x Pk  
+ 0.5 x M&Ik  
+ EvNFRk  
+ Harlan County Lake Ev charged to Kansas  
+ Lovewell Reservoir Ev charged to the Republican River  
+ GWk

CBCU Nebraska

=  
Deliveries from Courtland Canal to Nebraska lands x (1- %BRF)  
+ 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



- 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
- 0.17 x Culbertson Canal RF
- Culbertson Canal Extension RF to Main Stem
- + 0.24 x Meeker Driftwood Canal RF which returns to Driftwood Creek
- 0.9 x Red Willow Canal RF
  
- + Courtland Canal at Kansas-Nebraska State Line Gage Stn No. 06852500
- Courtland Canal RF in Kansas above Lovewell Reservoir
  
- IWS

Notes:

None of the Nebraska Haigler Canal RF returns to the North Fork of the Republican River

83% of the Culbertson Diversion RF and none of the Culbertson Extension RF return to Frenchman Creek

24 % of the Meeker Driftwood Canal RF returns to Driftwood Creek.

10% of the Red Willow Canal RF returns to Red Willow Creek

Courtland Canal RF in Kansas above Lovewell Reservoir =  $0.015 \times$  (Courtland Canal at Kansas-Nebraska State Line Gage Stn No. 06852500)

CWS = VWS - Change in Storage Harlan County Lake - Change in Storage Swanson Lake - FF

Allocation Kansas =  $0.511 \times$  CWS

Allocation Nebraska =  $0.489 \times$  CWS

## **V. Annual Data/ Information Requirements, Reporting, and Verification**

The following information for the previous calendar year shall be provided to the members of the RRCA Engineering Committee by April 15<sup>th</sup> of each year, unless otherwise specified.

All information shall be provided in electronic format, if available.

Each State agrees to provide all information from their respective State that is needed for the RRCA Groundwater Model and RRCA Accounting Procedures and Reporting Requirements, including but not limited to the following:

### **A. Annual Reporting**

#### **1. Surface water diversions and irrigated acreage:**

Each State will tabulate the canal, ditch, and other surface water diversions that are required by RRCA annual compact accounting and the RRCA Groundwater Model on a monthly format (or a procedure to distribute annual data to a monthly basis)

and will forward the surface water diversions to the other States. This will include available diversion, wasteway, and farm delivery data for canals diverting from the Platte River that contribute to Imported Water Supply into the Basin. Each State will provide the water right number, type of use, system type, location, diversion amount, and acres irrigated.

**2. Groundwater pumping and irrigated acreage:**

Each State will tabulate and provide all groundwater well pumping estimates that are required for the RRCA Groundwater Model to the other States.

**Colorado** – will provide an estimate of pumping based on a county format that is based upon system type, Crop Irrigation Requirement (CIR), irrigated acreage, crop distribution, and irrigation efficiencies. Colorado will require installation of a totalizing flow meter, installation of an hours meter with a measurement of the pumping rate, or determination of a power conversion coefficient for 10% of the active wells in the Basin by December 31, 2005. Colorado will also provide an annual tabulation for each groundwater well that measures groundwater pumping by a totalizing flow meter, hours meter or power conversion coefficient that includes: the groundwater well permit number, location, reported hours, use, and irrigated acreage.

**Kansas** - will provide an annual tabulation by each groundwater well that includes: water right number, groundwater pumping determined by a meter on each well (or group of wells in a manifold system) or by reported hours of use and rate; location; system type (gravity, sprinkler, LEPA, drip, etc.); and irrigated acreage. Crop distribution will be provided on a county basis.

**Nebraska** – will provide an annual tabulation through the representative Natural Resource District (NRD) in Nebraska that includes: the well registration number or other ID number; groundwater pumping determined by a meter on each well (or group of wells in a manifold system) or by reported hours of use and rate; wells will be identified by; location; system type (gravity, sprinkler, LEPA, drip, etc.); and irrigated acreage. Crop distribution will be provided on a county basis.

**3. Climate information:**

Each State will tabulate and provide precipitation, temperature, relative humidity or dew point, and solar radiation for the following climate stations:

State	Identification	Name
Colorado		
Colorado	C050109	Akron 4 E

Colorado	C051121	Burlington
Colorado	C054413	Julesburg
Colorado	C059243	Wray
Kansas	C140439	Atwood 2 SW
Kansas	C141699	Colby 1SW
Kansas	C143153	Goodland
Kansas	C143837	Hoxie
Kansas	C145856	Norton 9 SSE
Kansas	C145906	Oberlin1 E
Kansas	C147093	Saint Francis
Kansas	C148495	Wakeeny
Nebraska	C250640	Beaver City
Nebraska	C250810	Bertrand
Nebraska	C252065	Culbertson
Nebraska	C252690	Elwood 8 S
Nebraska	C253365	Gothenburg
Nebraska	C253735	Hebron
Nebraska	C253910	Holdredge
Nebraska	C254110	Imperial
Nebraska	C255090	Madrid
Nebraska	C255310	McCook
Nebraska	C255565	Minden
Nebraska	C256480	Palisade
Nebraska	C256585	Paxton
Nebraska	C257070	Red Cloud
Nebraska	C258255	Stratton
Nebraska	C258320	Superior
Nebraska	C258735	Upland
Nebraska	C259020	Wauneta 3 NW

**4. Crop Irrigation Requirements:**

Each State will tabulate and provide estimates of crop irrigation requirement information on a county format. Each State will provide the percentage of the crop irrigation requirement met by pumping; the percentage of groundwater irrigated lands served by sprinkler or flood irrigation systems, the crop irrigation requirement; crop distribution; crop coefficients; gain in soil moisture from winter and spring precipitation, net crop irrigation requirement; and/or other information necessary to compute a soil/water balance.

**5. Streamflow Records from State-Maintained Gaging Records:**

Streamflow gaging records from the following State maintained gages will be provided:

Station No	Name
00126700	Republican River near Trenton
06831500	Frenchman Creek near Imperial
06832500	Frenchman Creek near Enders
06835000	Stinking Water Creek near Palisade
06837300	Red Willow Creek above Hugh Butler Lake
06837500	Red Willow Creek near McCook
06841000	Medicine Creek above Harry Strunk Lake
06842500	Medicine Creek below Harry Strunk Lake
06844000	Muddy Creek at Arapahoe
06844210	Turkey Creek at Edison
06847000	Beaver Creek near Beaver City
	Republican River at Riverton
06851500	Thompson Creek at Riverton
06852000	Elm Creek at Amboy
	Republican River at the Superior-Courtland Diversion Dam

**6. Platte River Reservoirs:**

The State of Nebraska will provide the end-of-month contents, inflow data, outflow data, area-capacity data, and monthly net evaporation, if available, from Johnson Lake; Elwood Reservoir; Sutherland Reservoir; Maloney Reservoir; and Jeffrey Lake.

**7. Water Administration Notification:**

The State of Nebraska will provide the following information that describes the protection of reservoir releases from Harlan County Lake and for the administration of water rights junior in priority to February 26, 1948:

Date of notification to Nebraska water right owners to curtail their diversions, the amount of curtailment, and length of time for curtailment.

The number of notices sent.

The number of diversions curtailed and amount of curtailment in the Harlan County Lake to Guide Rock reach of the Republican River.

### **8. Moratorium:**

Each State will provide a description of all new Wells constructed in the Basin Upstream of Guide Rock including the owner, location (legal description), depth and diameter or dimension of the constructed water well, casing and screen information, static water level, yield of the water well in gallons per minute or gallons per hour, and intended use of the water well.

Designation whether the Well is a:

- a. Test hole;
- b. Dewatering Well with an intended use of one year or less;
- c. Well designed and constructed to pump fifty gallons per minute or less;
- d. Replacement Water Well, including a description of the Well that is replaced providing the information described above for new Wells and a description of the historic use of the Well that is replaced;
- e. Well necessary to alleviate an emergency situation involving provision of water for human consumption, including a brief description of the nature of the emergency situation and the amount of water intended to be pumped by and the length of time of operation of the new Well;
- f. Transfer Well, including a description of the Well that is transferred providing the information described above for new Wells and a description of the Historic Consumptive Use of the Well that is transferred;
- g. Well for municipal and/or industrial expansion of use;

Wells in the Basin in Northwest Kansas or Colorado. Kansas and Colorado will provide the information described above for new Wells along with copies of any other information that is required to be filed with either State or local agencies under the laws, statutes, rules and regulations in existence as of April 30, 2002, and;

Any changes in State law in the previous year relating to existing Moratorium.

### **9. Non-Federal Reservoirs:**

Each State will conduct an inventory of Non Federal Reservoirs by December 31, 2004, for inclusion in the annual Compact Accounting. The inventory shall include the following information: the location, capacity (in Acre-feet) and area (in acres)

at the principal spillway elevation of each Non-Federal Reservoir. The States will annually provide any updates to the initial inventory of Non-Federal Reservoirs, including enlargements that are constructed in the previous year.

Owners/operators of Non-Federal Reservoirs with 200 Acre-feet of storage capacity or greater at the principal spillway elevation will be required to provide an area-capacity survey from State-approved plans or prepared by a licensed professional engineer or land surveyor.

**10. Augmentation Plan:**

Each State will provide a description of the wells, measuring devices, conveyance structure(s), and other infrastructure to describe the physical characteristics, water diversions, and consumptive use associated with each augmentation plan. The States will provide any updates to the plan on an annual basis.

**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
- i. CNF Augmentation Plan well pumping and augmentation delivery records

**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 <u>and/or</u> <u>Augmentation Water Supply Credit</u> <u>CNF Augmentation Water Supply Credit</u>	Difference between Allocation and the Computed Beneficial Consumptive Use offset by Imported Water Supply Credit <u>and/or</u> <u>Augmentation Water Supply Credit</u> <u>CNF Augmentation Water Supply Credit</u> 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 <u>and/or CNF Augmentation Water Supply</u> (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							



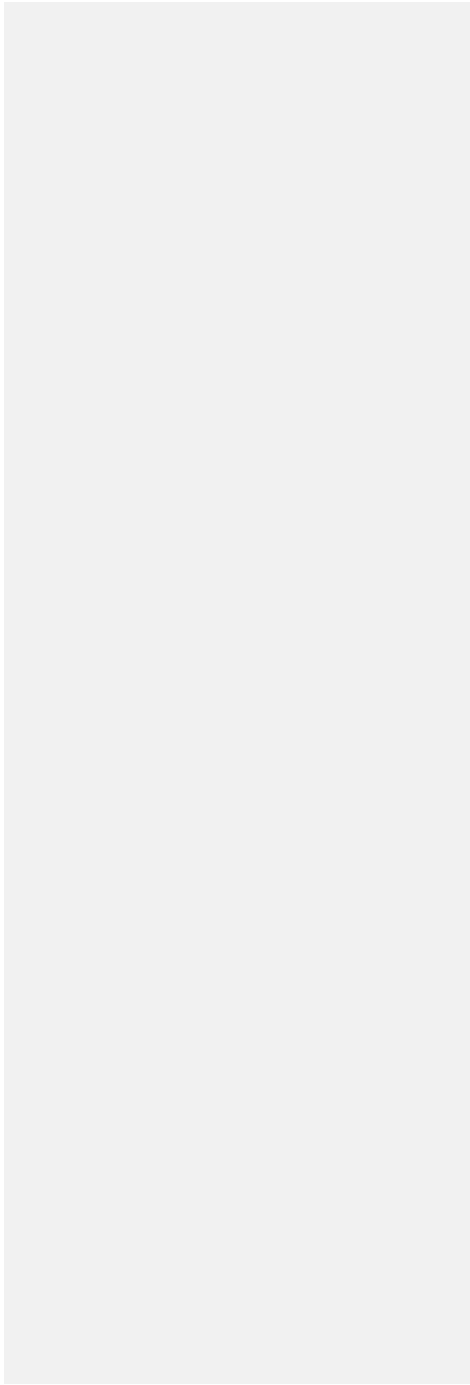


Table 5A: Colorado Compliance During Water-Short Year Administration

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 <del>and/or Augmentation Water Supply Credit</del> <del>CNF Augmentation Water Supply Credit</del> excluding Beaver Creek	Difference between Allocation and the Computed Beneficial Consumptive Use offset by Imported Water Supply Credit <del>and/or Augmentation Water Supply Credit</del> <del>CNF Augmentation Water Supply Credit</del> 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						
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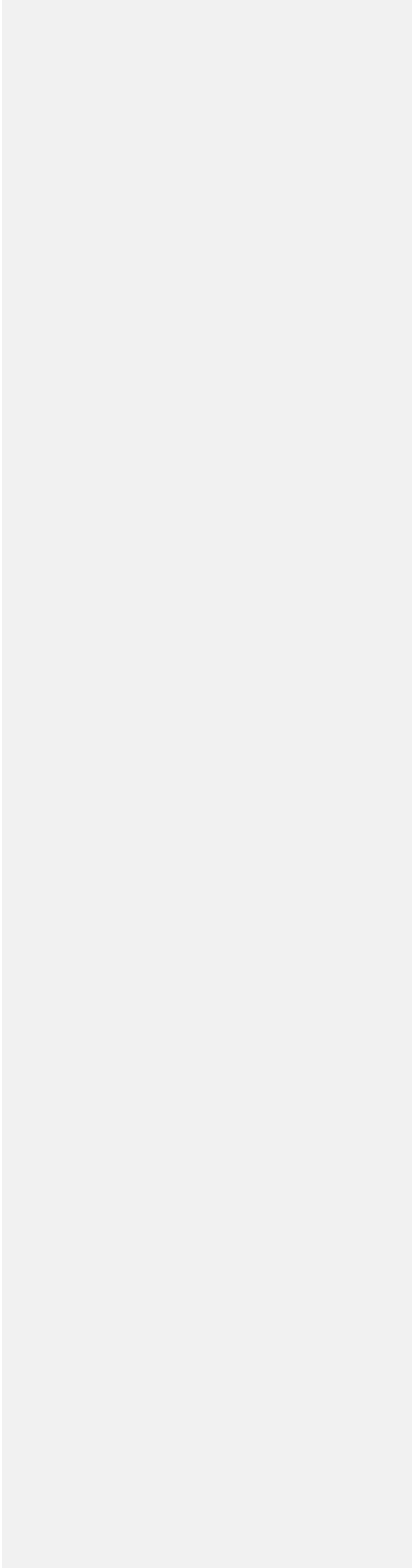


Table 5C: Nebraska Compliance During Water-Short Year Administration

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								

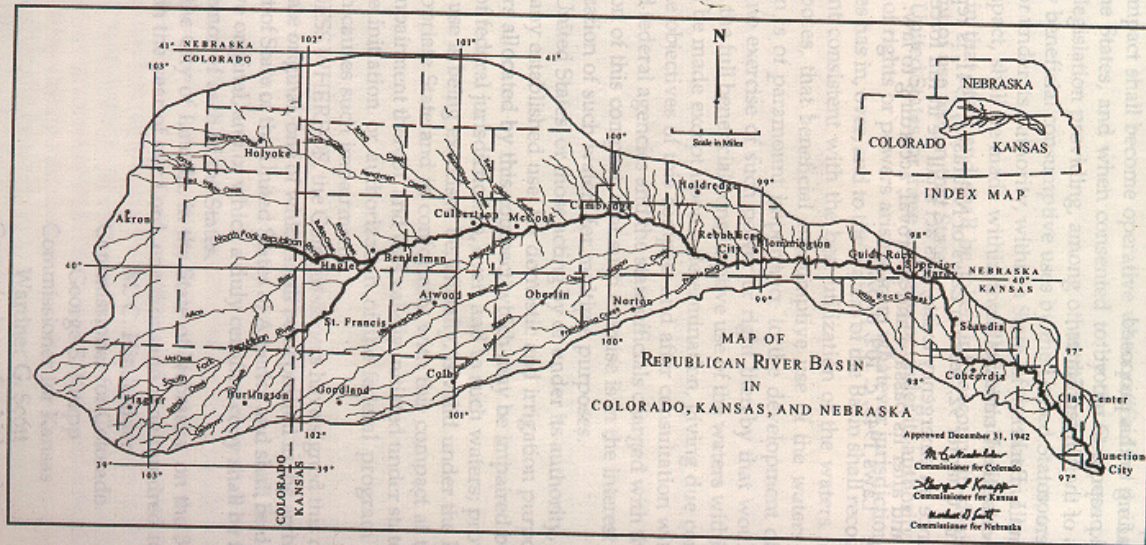
Table 5D: Nebraska Compliance Under a Alternative Water-Short Year Administration Plan

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						

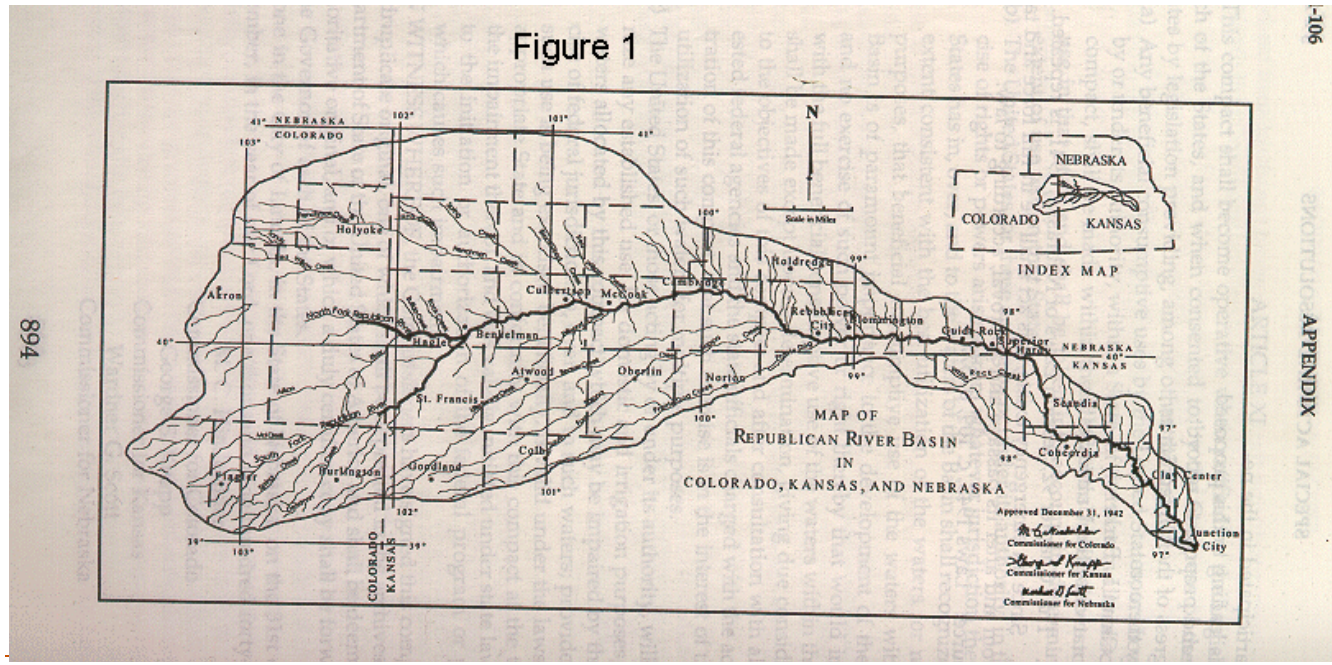
Figure 1



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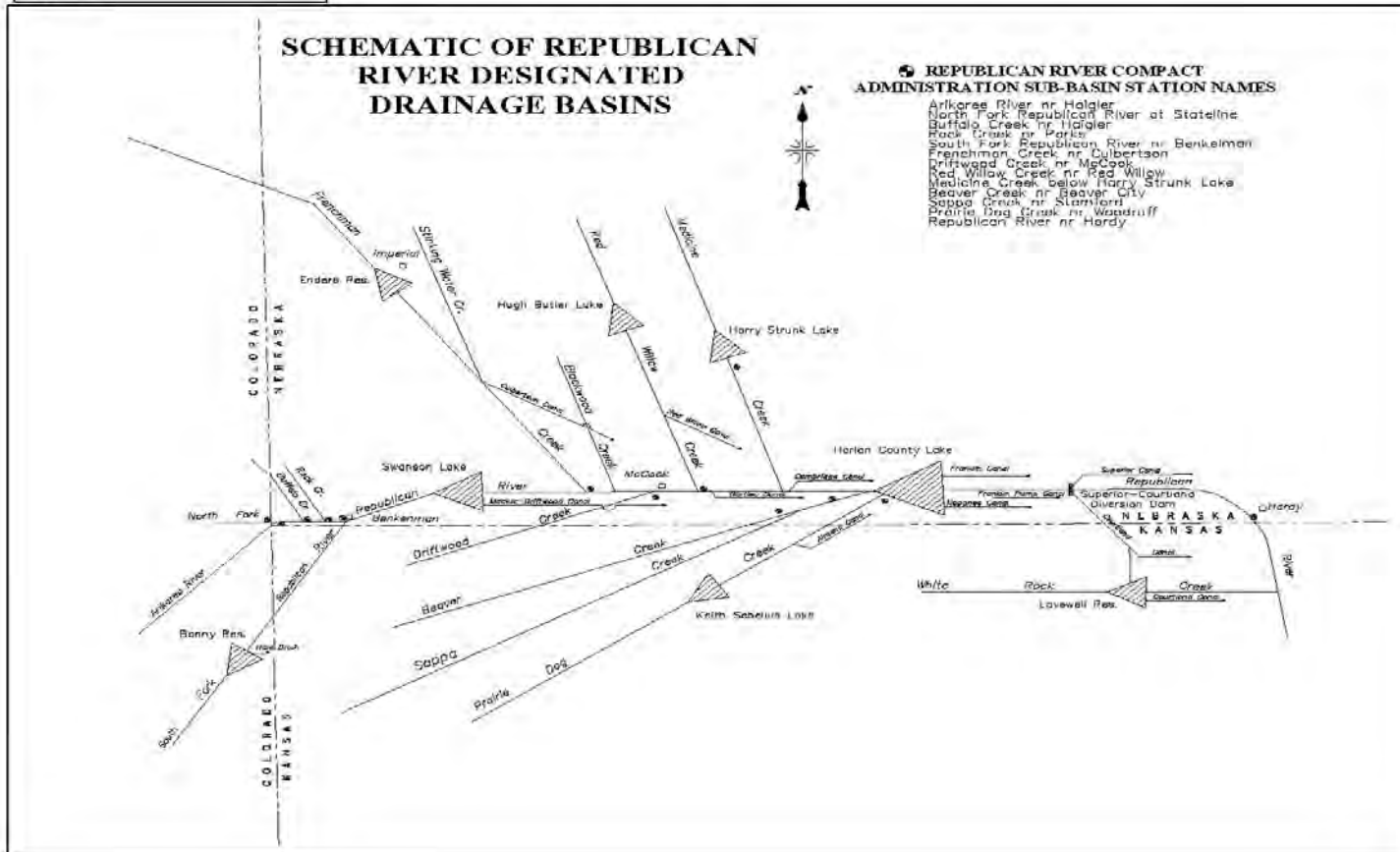
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APPENDIX



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

Figure 2



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





Attachment 1: Sub-basin Flood Flow Thresholds

Sub-basin	Sub-basin Flood Flow Threshold Acre-feet per Year <sup>3</sup>
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

<sup>3</sup> 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. For the purpose of compliance with III.B.1, the Gaged Flows shall not include Augmentation Water Supply Credits CNF Augmentation Water Supply Credits delivered in any calendar year.

## 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.

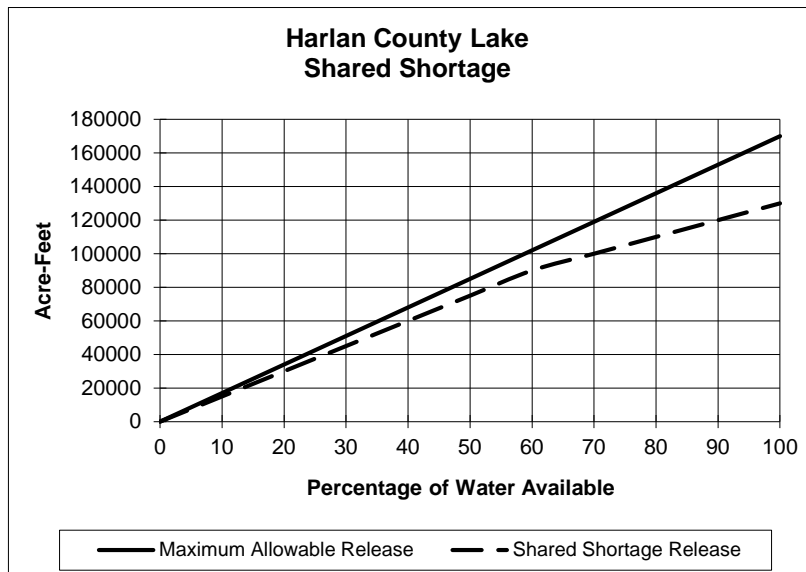
In addition, both agencies also recognized that the inflow to the project could continue to decrease with further upstream well development and water conservation farming. Due to these

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

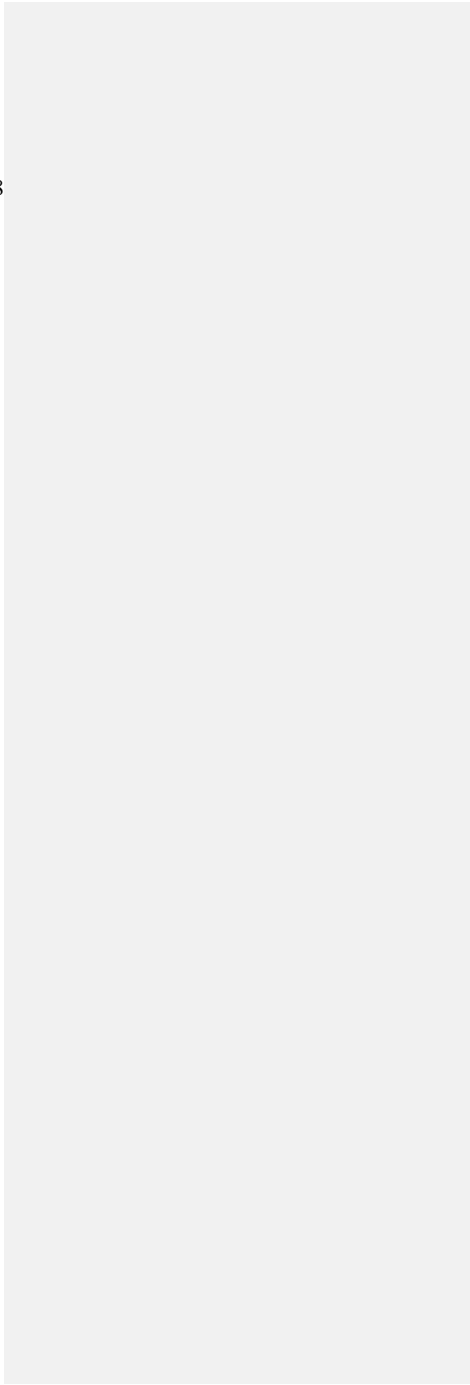
## BASELINE RUN - 1993 LEVEL INFLOW TO HARLAN COUNTY RESERVOIR

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
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## 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

<b>Trigger Calculations Based on Harlan County Lake Irrigation Supply</b>	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

Attachment 5: Projected Water Supply Spread Sheet Calculations

<b>Year 2001-2002 Oct - Jun Trigger and Irrigation Supply Calculation</b>									
Calculation Month	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Previous EOM Content	236.5	235.9	238.6	242.9	248.1	255.1	263.8	269.6	276.2
Inflow to May 31	73.6	67.3	62.3	57.6	53.1	44.3	30.2	17.2	0.0
Last 5 Yrs Avg Inflow to May 31	125.6	114.8	101.7	89.5	76.6	59.9	37.5	18.1	0.0
Evap to May 31	12.8	10.6	9.3	8.8	8.2	7.4	5.9	3.2	0.0
Est. Cont May 31	297.3	292.6	291.6	291.7	293.0	292.0	288.1	283.6	276.2
Est. Elevation May 31	1944.44	1944.08	1944.00	1944.01	1944.11	1944.03	1943.72	1943.37	1942.77
Max. Irrigation Available	153.2	148.5	147.5	147.6	148.9	147.9	144.0	139.5	132.1
Irrigation Release Est.	120.1	117.4	116.8	116.8	118.1	117.1	116.8	116.8	116.8
Trigger - Yes/No	NO	YES	YES	YES	YES	YES	YES	YES	YES
130 kAF Irrigation Supply - Yes/No	NO	NO	NO	NO	NO	NO	NO	NO	NO

Attachment 5: Projected Water Supply Spread Sheet Calculations

<b>Year 2002</b>				
<b>Jul - Sep</b>				
<b>Final Trigger and</b>				
<b>Total Irrigation Supply</b>				
<b>Calculation</b>				
Calculation Month		<b>Jul</b>	<b>Aug</b>	<b>Sep</b>
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.

RRWCD Compact Compliance Wells						4-Jan-2013
Permit #		RRWCD submitted & GWC published (af/yr)	Corrected amount (af/yr)	Sand Hills approved for export (af/yr)	To be approved by GWC (af/yr)	Comments
		first publication				
12567-FP		201		N/A	0	Located in Central Yuma GWMD
12589-FP		376	297	372	297	Acres corrected from 309 ac to 200 ac
12967-FP	same well	345		333	333	
16920-FP		0			0	
13509-FP	same well	254		273	244	
16075-FP		30			29	
13511-FP		192		173	173	
13513-FP	same well	258		257	220	
16074-FP		44			37	
13522-FP		204		189	189	
13813-FP	same well	174		203	171	
16923-FP		32			32	
13814-FP		334		323	323	
13815-FP		291		311	291	Sand Hills approved more than historical amount
13856-FP	same well	241		249	241	
16067-FP		8			8	
13857-FP		229		217	217	
13858-FP		228		206	206	
13859-FP	same well	228		260	220	
16069-FP		42			40	
14018-FP		252		234	234	
14019-FP		217		206	206	
14022-FP		289		255	255	
14023-FP		219		197	197	
14024-FP		141		129	129	
14027-FP		251		237	237	
14028-FP		218		202	202	
14121-FP		437		420	420	
14122-FP		215		204	204	
14396-FP		192		180	180	
14397-FP		192		184	184	
14398-FP		240		230	230	
14600-FP		197		187	187	
14718-FP		526		526	526	
14719-FP		455		424	424	
14753-FP		310		267	267	
15285-FP		161		140	140	
18011-FP		431		421	421	
18012-FP	same well	221		317	218	
19000-FP		101			99	
18013-FP		350	291	350	291	Acres corrected from 250 ac to 228 ac
18014-FP		259		247	247	
18015-FP		549		497	497	
18017-FP	same well	180.5		353	177	
19001-FP		180.5			177	
18018-FP		230		218	218	
18019-FP		173		163	163	
18780-FP		192		192	192	
18781-FP		216		206	206	
18783-FP		273		273	273	
18966-FP		172		172	172	
19005-FP		178		174	174	
19372-FP		218		211	211	
20896-FP		169		168	168	
21476-FP		144		139	139	
subtotal		12,259	12,121	11,689	11,535	
		second publication				
14033-FP		279		279	279	
19004-FP		141		141	141	
23222-FP		230	168	230	168	Pumping corrected to permitted amount
4319-FP	same well	75		75	75	
4922-FP		0			0	
20198-FP		194		194	194	
20196-FP		249		249	249	
subtotal		1,168	1,106	1,168	1,106	
Total		13,427	13,227	12,857	12,641	

## **Modeling the Colorado Compliance Pipeline in the RRCA Groundwater Model**

Modeling the Colorado Compliance Pipeline (the “CCP”) in the RRCA Groundwater Model (the “Model”) consists of two parts. The first involves fifteen wells that will be pumped via a collector system and storage tank into the pipeline (the “CCP Wells”). The water rights for these wells were changed from existing irrigation wells that will be retired. The historic consumptive use from those wells has been transferred to the CCP Wells. The second part involves the surface water outflow from the pipeline.

### **Modeling of Well Pumping**

The irrigation wells that were acquired as part of the CCP will be removed from the irrigation well data set used to represent irrigation wells in the Republican River Basin in Colorado. Because the irrigation wells will no longer be pumped, they will not be included when calculating pumping and return flows from agricultural wells.

Instead, production for each CCP Well will be recorded and supplied as monthly input values by well based on actual production of each well. The pumping of each well will be considered to be fully consumptive and the appropriate volume added to the Republican River Pre-Processor (“rpp”) pumping input files (“.pmp” files) for each month. Since there are no irrigation return flows associated with these wells, nothing will be added to the “.rcg” files.

Those pumping values for the CCP Wells will be ON in all of the model simulations except the simulation with pumping in Colorado turned OFF. Therefore, the impacts of the CCP Wells on baseflow will be evaluated as part of the evaluation of other Colorado pumping. No changes are required to “rpp” to simulate the CCP Wells.

Only the consumptive use of the retired irrigation wells is transferred to the CCP Wells. It was previously demonstrated that due to the distance between the wells and the North Fork of the Republican River, the changes in the timing of the pumping results in no net increase in depletions of baseflow in the Republican River.

### **Modeling of Pipeline Outflow**

The outflow of the CCP will be added to the stream network for all the Model simulations.

The MODFLOW stream package requires that the stream network be specified in such a way that the flows in the stream network can be solved from the top to the bottom of the system. The outflow from the CCP must be added to the stream network as a tributary to Segment 153. In order to do so, a new segment must be created in the stream network with a segment number less than 153. To avoid renumbering all of the segments in the stream network and the corresponding change required to the accounting that would occur as a result of renumbering all the segments, a change will be made to the stream network that avoids renumbering.

Muddy Creek in Nebraska is represented as Segments 122 and 125. The model cells representing Segment 122 will be added to Segment 125, and the routing updated so that the flow from Segments 33 and 66 that previously went to Segment 122 will go to Segment 125 instead.

Segment 122 will then be re-purposed to represent the outflow from the CCP. The new Segment 122 will have a single cell with a stream conductance of zero. The monthly CCP outflow volume will be set as the inflow to Segment 122. The stream routing will be updated so that the outflow from Segments 122 and 130 will go to Segment 153. The result will be that the inflow into Segment 153 will be the sum of the simulated baseflow in the North Fork of the Republican River at the Colorado-Nebraska State Line and the CCP outflow.

The monthly CCP outflow volume will be added to all simulations. The outflow will therefore cancel out in all the CBCU<sub>G</sub> terms it would potentially be included. Therefore no changes are required to the acct program used to summarize the groundwater model results for the accounting spreadsheets.

A change to the “mkstr” program will be required in order to add the CCP outflow to the stream package file for every month. The existing Model version 12s.str stream template file will be updated to reflect the change to Segments 122 and 125 and changes to the routing of segments 63, 66, 122 and 130. A new version of the “mkstr” program called “mkstr2” will be used to read monthly CPP volumes from the file “flow.dbf” and add it to Segment 122.

### **Changes to Procedures**

The CCP Wells and CCP outflow will be processed along with the annual updates to the Model and the CCP data supplied along with the backup information for other components of the Colorado data.

The Model will be updated to Version 12s3 to reflect changes in the stream network required to add the outflow from the CCP to the stream network. Version 12s3 will use the updated “mkstr2” program that will require an additional “flow.dbf” input file to specify the monthly CCP outflow volume. No changes are required to the other programs used to run the Model.

The CCP will require no changes to the “acct” program that summarizes the Model results for incorporation into the accounting spreadsheets. Changes to the accounting spreadsheets to account for the Augmentation Water Supply resulting from the CCP are described elsewhere.

**Exhibit B**

**Arbitration Time Frame Designation**

***Colorado v. Kansas & Nebraska***

**Colorado Compact Compliance Pipeline**

Colorado Formally Submits Resolution to RRCA 4/5/2013

RRCA Special Meeting and Vote on Resolution 5/5/2013

*If Necessary...*

Colorado Formally Submits the Issue to Arbitration 5/5/2013

Nebraska and Kansas May Amend the Scope of the Dispute 5/15/2013

States Submit Lists of Proposed Arbitrators 5/15/2013

States Meet and Confer Regarding Arbitrator Selection 5/25/2013

CDR Selects Arbitrator (*if necessary*) 5/25/2013

Initial Conference with Mediator; Set Schedule for Arbitration 6/1/2013

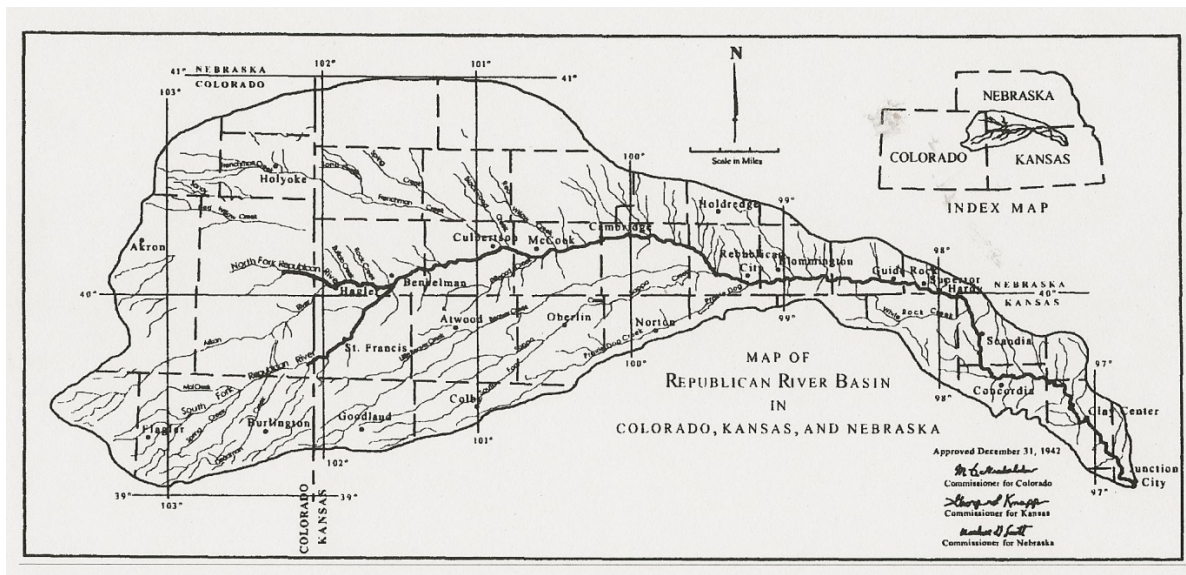
Final Day of Arbitration Hearings 9/29/2013

Arbitrator Issues Written Decision 11/28/2013

# REPUBLICAN RIVER COMPACT ADMINISTRATION

## Annual Meeting

### August 28, 2014



SUMMARY AND MINUTES OF THE  
2014 ANNUAL MEETING OF THE  
REPUBLICAN RIVER COMPACT  
ADMINISTRATION

Lincoln, Nebraska

AUGUST 28, 2014

**Summary & Minutes**

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

**Agenda Item 1: Introductions**

The Annual Meeting of the Republican River Compact Administration (RRCA) was called to order by Nebraska Commissioner and Chairperson Brian Dunnigan at 9:00 a.m. August 28, 2014. Commissioner Dunnigan asked for introductions around the room. A complete list of those attendees is attached as Exhibit B. Some of the attendees included:

Name	Representing
Brian Dunnigan	Nebraska Commissioner and Chairperson
Jim Schneider	Nebraska Engineering Committee Member and Chairperson
Dick Wolfe	Colorado Commissioner
Ivan Franco	Colorado Engineering Committee Member
David Barfield	Kansas Commissioner
Chris Beightel	Kansas Engineering Committee Member

**Agenda Item 2: Adoption of the Agenda**

Commissioner Dunnigan introduced the agenda. Commissioner Barfield moved to adopt the agenda as is and the motion was seconded by Commissioner Wolfe. It was unanimously approved. A copy of the agenda is attached as Exhibit C.

**Agenda Item 3: Status of Report and Transcripts for 2013 Annual Meeting and Subsequent Special Meetings**

Commissioner Barfield stated the transcripts for the annual meeting and four special meetings have been reviewed and essentially are in different stages of completeness. Colorado has been the first to receive them for review and then they were passed to Nebraska. Three reports have

been sent to Colorado, one of which has been subsequently sent to Nebraska. The final two reports will be sent through the review process soon.

#### **Agenda Item 4: Report of Chairman and Commissioners' Reports**

- a. **Kansas:** Commissioner Barfield reported that after two years of drought conditions in 2011-12, the state had seen some catching up in 2013 and 2014. In spite of that, the Republican River Basin continues to experience water administration. In the first half of the year, 196 water rights were administered in the Basin, reduced to 68 water rights currently..

Commissioner Barfield stated there was limited activity in the water legislature this year due to the on-going development of a 50-year vision for the future of the water resources in Kansas. It is anticipated that this process will spur water legislation next session (2015)

Commissioner Barfield reported that Kansas remains in full compliance with the Republican River Compact, including additional Compact duties and participation in the dispute resolution processes under the Final Settlement Stipulation (FSS). He deferred to Commissioner Wolfe to report on the status of agreements related to the Colorado Compact Compliance Pipeline and Bonny Reservoir issues.

In conclusion of his report, Commissioner Barfield noted the three states are currently engaged in discussions to improve collective management of the basin's water issues and resolve pending disputes, and he feels these discussions are productive.

- b. **Colorado:** Commissioner Wolfe expressed gratitude to his staff who he feels has really gone the extra mile in Compact compliance efforts. He also noted that the increase in meetings of the engineer advisors who assist the commissioners has been productive in providing assistance to the commissioners. He also thanked Willem Schreüder for his modeling assistance and the District for assistance with Colorado's Compact compliance efforts.

In regards to the Compact Compliance Pipeline project, Colorado delivered 4,000 acre-feet by April, in accordance with the one-year temporary agreement that was approved by the Commissioners in December. By September 1<sup>st</sup>, Colorado will make a projection of what they anticipate will need to be pumped and delivered through the augmentation station into the North Fork for the remainder of the calendar year. Colorado is currently working on some temporary agreements to extend the operation of the pipeline and a comprehensive settlement of the disputes between the states.

Wolfe summarized some of Colorado's other compliance efforts. Since 2009 when meters were put into place, they have been able to closely monitor the amount of well withdrawals and have taken action on pumping violations in 2012 and 2013. No violations are anticipated in 2014. The District continues surface water buyouts, particularly on the South Fork of the Basin. The newly formed Water Preservation Partnership, established by the District and the groundwater management districts, has made great strides in the past year in their conservation practices and in finding



grant funding for projects such as an economic impact study and a study of conservation practices.

Wolfe stated that after some effort from his office, there has finally been a bill passed that allows local groundwater management districts to have authority to enforce actions and fines for water administration. He plans on working closely with local management to coordinate the activity. All this is being done to achieve Compact compliance.

Wolfe thanked the states for all the work getting through disputes and looks forward to the future relationships of the Compact.

- c. **Nebraska:** Commissioner Dunnigan stated that Nebraska is also in compliance with the Republican River Compact and, based on estimates, will continue to be in compliance with the two- and five-year period ending in 2014. Dunnigan also noted that Nebraska's compliance efforts would be improved substantially by implementation of the modified accounting procedures recommended by Special Master Kayata. Nebraska's compliance efforts have afforded Kansas' water users full access to Kansas' allocations. Dunnigan gave credit to the Basin NRDs as they continue to demonstrate commitment to compliance. NRD programs and projects that will reduce and/or offset depletions in the basin include the Rock Creek augmentation project, the N-CORPE augmentation project, permanent and temporary retirement of irrigated lands, and leases of surface water. The Department continues to look for various water management alternatives through the WaterSMART studies and collaboration with irrigation districts, natural resources districts, and the Bureau of Reclamation.

During the 2014 Nebraska Legislative Session, a new set of laws was established that defines governance for administering the new Water Sustainability Fund. The Fund represents a significant increase in funding for water projects across the state and provides for additional basin-wide planning processes. As a result, a basin-wide planning process will begin soon for the Nebraska portion of the Republican River Basin.

Last year Nebraska brought several time-critical issues before RRCA (Rock Creek Augmentation Plan, N-CORPE Augmentation Plan, and Alternative Water Short Year Plan), each of which resulted in arbitration hearings which were ruled in Nebraska's favor. In spite of this work, Kansas continues to deny Nebraska full credit for its augmentation projects or approve the Alternative Water Short Year accounting, which has been a burden to Nebraska water users. Dunnigan encouraged the Commissioners to exercise their duties to find solutions and move forward, or further litigation may ensue. He reminded the attendees of Special Master Kayatta's concluding remarks in his report to the United States Supreme Court for resolution.

Dunnigan then turned the meeting to Jesse Bradley to give report on field office activities in the basin during 2013. Bradley stated the field office conducted 440 reservoir compliance visits, 410 stream gage visits, and 320 on-site water administration investigations. He then went on to describe the activities these visits involved. Bradley also summarized Nebraska's 2013 water administration activities in basin, sharing details of the administration-related letters that were sent out to various parties throughout the year to maintain Compact compliance, as 2013 was a

Compact Call Year for Nebraska.

Commissioner Wolfe then made a correction to the funding report he gave in regards to the Republican River District's economic study.

### **Agenda Item 5: Federal Reports**

- a. **Bureau of Reclamation:** Aaron Thompson gave highlights of the 2013 reservoir operation season. There were severe water shortages throughout the irrigation districts due to the Nebraska 2013 Compact Call water right administration. Additional water shortages have continued into 2014. Reclamation is concerned about the irrigation districts' financial viability if administration continues. He further shared that the operation and maintenance expenses of the federal dams are increasing significantly due to aging infrastructure. Reclamation and Nebraska did collaborate on an excess capacity contract with the Kansas Bostwick Irrigation District to temporarily store water in Harlan County Lake. He looks forward to further collaboration with all three states to ease the strain of water supplies.

The WaterSMART study continues and has been extended by one year, with the final report being completed in November of 2015 instead of November of 2014 due to complications of model development. A draft engineering report was completed with cost estimates for multiple alternatives, and plans are to have the analyses completed and the report written by the end of 2015.

Thompson also reported for the Conservation Committee. He reported that the study is complete with a final study report distributed to the RRCA members in July. This replaces the October 2012 report. A PDF copy was provided to each state's Conservation Committee representative to use on their respective websites. Study data is being organized for the archives on Principia's website.

Returning to Bureau of Reclamation activities in the western portion of the basin, Thomson reported that negotiations were started with Colorado to resolve the contract dispute regarding Bonny Dam. In addition, the Red Willow Safety of Dams modification was completed in December 2013.

A written Bureau of Reclamation report was distributed at the meeting (Exhibit D).

- b. **U.S. Army Corps of Engineers:** Ken Stark shared that progress is being made on the tainter gate repairs at Harlan County Dam. Stark shared some history about the dam; mostly that they are working with 62-year-old parts and gave a detailed report on the phases of the repair work being done and to be done. The current contract is for work on the stoplogs, which should be completed near the end of 2014. Reclamation will be issuing a new contract for additional tainter gate repairs, including repairs to electrical controls, brakes, arms, and bearings. The new contract will be awarded in

September and will continue for 3.5 years. The Corps of Engineers will not lower or release water for the repairs. The overall purpose of the repairs is to restore full operation and the ability to have normal operations during flood control. Stark's presentation is attached as Exhibit E.

Commissioner Barfield voiced support for having a safe and fully functional dam but expressed concern with the very significant cost, urging the Corps to find the most cost-effective solutions for these maintenance concerns.

- c. **U.S. Geological Survey:** Jason Lambrecht gave highlights on the fifteen stream gages operated by USGS for the Compact. A report on these stream gages was distributed at the meeting (Exhibit F). Nine of the gages operated in the top five of the lowest streamflow during water year 2013. Lambrecht indicated that USGS will be assuming operation of two current Nebraska DNR gages in the Republican Basin, which are located at Beaver Creek and Guide Rock. USGS will also be restarting the Republican River at Benkelman gage. These operations will be on the USGS webpage starting October 1. So far through water year 2014, all of the USGS stream gages are work-checked and approved, with data on the website through around April of 2014. Lambrecht summarized the USGS North Platte Field Office's gage maintenance activities in the basin.

#### **Agenda Item #6: Committee Reports**

- a. **Engineering Committee:** Signed copies of the Engineering Committee report were distributed to the three states (Exhibit G). Jim Schneider reviewed the report's executive summary. The Committee met five times and completed the assignments of holding quarterly meetings, exchanging accounting data and documentation, discussing modeling and data tasks, discussing issues on final accounting, budget issues, and reviewing each state's contracts with Principia Mathematica. Ongoing assignments include resolving concerns related to recharge and return flow methods, continuing efforts to finalize accounting for 2006 through 2012, discussing any accounting changes that may be needed for surface water diversion for the purpose of recharging groundwater, discussing developing an application and approval process for future augmentation plans, exploring options for sharing evaporation charges for Harlan County Lake, exploring potential means to adjust the accounting of Harlan County Lake for the mutual benefit of the states, and exploring the development of an RFP for the annual model update and repository.

The Engineering Committee recommended that the RRCA discuss the exchange of data and documentation in the modeling runs completed by Principia Mathematics for 2013, the establishment of a budget committee, the conservation terrace study, as well as the other recommended Engineering Committee assignments for the following year.

Commissioner Barfield indicated that the Engineering Committee report and recommended assignments were reviewed in detail at a work session the previous afternoon, so the RRCA is prepared to act on the report.

### **Agenda Item #7: Old Business**

- a. Jim Schneider noted that accounting from 2006 through 2013 still needs approval and finalizing. All the data for the accounting has been submitted. There are some issues still involved in the Supreme Court litigation and others in arbitration. The Engineering Committee will continue to work on two additional issues and will also work on getting the hopeful resolution on augmentation plans and other accounting issues that have been arbitrated into a final form for the RRCA to approve.

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

- a. Issues raised by the States: None
- b. Action on Engineering Committee Report and Assignments: Wolfe moved to approve the Engineering Report and assignments for the coming year. Barfield seconded the motion and it was passed.

### **Agenda Item #9: Remarks from the Public**

Dennis Coryell, President of the Republican River Water Conservation District in Colorado, conveyed thanks to the Compact for temporary approval for their augmentation plan and Compact Compliance Pipeline and urged the three states to continue working in an agreeable manner to resolve the remaining issues. He requested that Bonny Reservoir be considered dry for accounting purposes, since it is actually dry. He reported that millions of dollars were spent to get Colorado in compliance with no permanent agreement, and their compliance efforts retired thousands of acres from irrigation, most of those acres permanently. He described the continued work that will be done to help conserve water in Colorado. In closing, he again urged a resolution of issues.

There were no further remarks from the public.

### **Agenda Item #10: Future Meeting Arrangements**

Nebraska will host next year's meeting in Lincoln. The dates under consideration are August 26th for the working session and August 27th for the Annual Meeting.

### **Agenda Item #11: Adjournment**

The meeting was adjourned at 10:06 a.m. on August 28, 2014.

The August 28, 2014 Annual Meeting report is hereby approved by unanimous vote of the RRCA on this 24<sup>th</sup> day of August, 2016.

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

DATE SIGNED: \_\_\_\_\_  
Dick Wolfe, Chairperson & Colorado Commissioner

DATE SIGNED: \_\_\_\_\_  
Gordon W. Fassett, Nebraska Commissioner

DATE SIGNED: \_\_\_\_\_  
David Barfield, Kansas Commissioner

**Exhibits**

- Exhibit A: Transcript of the 2014 Annual Meeting
- Exhibit B: Attendance of the 2014 Annual Meeting and Sign-In Sheets
- Exhibit C: Agenda for the 2014 Annual Meeting
- Exhibit D: Bureau of Reclamation Report, *Nebraska-Kansas Area Report to the Republican River Compact Administration*, August 28, 2014
- Exhibit E: U.S. Army Corps of Engineers Presentation, *Harlan County Dam Tainter Gate Repairs*, August 28, 2014
- Exhibit F: U.S. Geological Survey Report, *Republican River Compact Nebraska Stream-Gaging Data Water Year 2013*, August 28, 2014
- Exhibit G: Engineering Committee Report for the 2014 Annual Meeting

# EXHIBIT A



2014 ANNUAL MEETING OF THE  
REPUBLICAN RIVER COMPACT ADMINISTRATION

August 28, 2014  
9:00 a.m. Central Time  
Auld Pavillion at Antelope Park  
1650 Memorial Drive  
Lincoln, Nebraska

MEMBERS PRESENT

FOR NEBRASKA: Commissioner Brian Dunnigan, Chairperson  
Justin Lavene  
Jesse Bradley  
Jim Schneider

FOR COLORADO: Commissioner Dick Wolfe  
Ivan Franco

FOR KANSAS: Commissioner David Barfield  
Burke Griggs  
Chris Beightel  
Chris Grunewald



REPORTER'S CERTIFICATE:

State of Nebraska )  
 ) ss.  
County of Lancaster )

I, WENDY C. CUTTING, reporter for GENERAL REPORTING SERVICE, certify that I reported the proceedings in this matter; that the transcript of testimony is a true, accurate, and complete extension of the recording made of these proceedings.

IN TESTIMONY WHEREOF, I have hereunto set my hand at Lincoln, Nebraska, this \_\_\_\_ day of September, 2014.

\_\_\_\_\_  
Reporter

- - -

1 PROCEEDINGS:

2 CHAIRPERSON DUNNIGAN: Good morning and welcome to  
3 Lincoln. At this time, I'd like to call the Annual Meeting  
4 of the Republican River Compact Administration to order. My  
5 name is Brian Dunnigan and I'm the Director of the Nebraska  
6 Department of Natural Resources and Commissioner for the  
7 Republican River Compact. I'm also the Chairman for the  
8 Compact this year.

9 If you didn't pick up an agenda by the door,  
10 please get an agenda if you need one. They were on the  
11 table. There's also a sign-in sheet by the door, and we can  
12 send that around if you didn't sign in on the sign-up sheet.  
13 We'd sure like to have you sign in.

14 We are going to go around and have some  
15 introductions with everybody here today. I'll start and  
16 just introduce my team at the front table and then I'll ask  
17 each state to introduce their team, and then we'll just send  
18 the microphone around in the audience. To my left is Justin  
19 Lavene from the Attorney General's Office, far left, Jesse  
20 Bradley from the Department, and Jim Schneider, our Deputy  
21 Director from the Department.

22 Commissioner Barfield.

23 COMMISSIONER BARFIELD: Thank you, and thank you,  
24 Chairman Dunnigan. It's a pleasure to be here this morning.  
25 My name is David Barfield and I'm Commissioner for Kansas.

1 With me, all to my left here is Burke Griggs, and the far  
2 left is Chris Grunewald from the Attorney General's Office.  
3 And also with me is Chris Beightel, who is our Engineering  
4 Committee representative.

5 CHAIRPERSON DUNNIGAN: Thank you.

6 Commissioner Wolfe.

7 COMMISSIONER WOLFE: Good morning, everyone. Dick  
8 Wolfe, Commissioner for Colorado. We're kind of light here  
9 today, but with me is Engineer Advisor, Ivan Franco. Scott  
10 Steinbrecher from the Attorney General's Office was unable  
11 to join us. We're thinking of him and his family with the  
12 emergency situation that came up with his newborn daughter.  
13 So, he was unable to join us today. And then, hopefully,  
14 we'll have an opportunity to go through with the audience  
15 and introduce some of our other staff and representatives  
16 from Colorado here today.

17 CHAIRPERSON DUNNIGAN: Thank you, Commissioner  
18 Wolfe.

19 Brad, if you'd want to start, we'll just go  
20 through the audience.

21 MR. EDGERTON: I'm Brad Edgerton from Frenchman-  
22 Cambridge Irrigation District.

23 MR. FELKER: Don Felker, Frenchman Valley & H&RW.

24 MR. ALBERT: Kenneth Albert, Frenchman Valley,  
25 Director, Nebraska.

1 MR. KOTSCHWAR: Jerry Kotschwar from Frenchman  
2 Valley.

3 MR. KEELER: Dave Keeler, Colorado, Republican  
4 River Basin Water Commissioner.

5 MR. PERKINS: Sam Perkins, Kansas Division of  
6 Water Resources.

7 MR. THOMPSON: Aaron Thompson with the Bureau of  
8 Reclamation.

9 MR. SCOTT: Craig Scott with the Bureau of  
10 Reclamation.

11 MR. DELKA: Mike Delka with the Bostwick  
12 Irrigation District, Nebraska.

13 MR. THORNBURN: John Thornburn, Tri-Basin Natural  
14 Resources District in Holdredge, Nebraska.

15 MR. MERRIGAN: Bob Merrigan, Middle Republican  
16 Natural Resources District in Curtis, Nebraska.

17 MS. ERICKSON: Chelsea Erickson, Kansas Division  
18 of Water in the Stockton Field Office.

19 MR. ERICKSON: Donald Erickson, Stockton.

20 MR. AMPE: Peter Ampe, Counsel for the Republican  
21 River Water Conservation District.

22 MS. DANIEL: Deb Daniel, General Manager of the  
23 Republican River Water Conservation District.

24 MR. SULLIVAN: Mike Sullivan, Colorado Division of  
25 Water Resources.

1 MR. CORYELL: Dennis Coryell, Republican River  
2 Water Conservation District.

3 MR. LAMBRECHT: I'm Jason Lambrecht with the USGS,  
4 Nebraska Water Science Center.

5 MS. EICHHORST: Jean Eichhorst, Kearney, Nebraska,  
6 and Lawrence, Kansas.

7 MR. STARK: Ken Stark, US Army Corps of Engineers.

8 MR. BOWEN: Jim Bowen, Corps of Engineers, Harlan  
9 County Lake.

10 MR. WILCOX: Dustin Wilcox, Nebraska Association  
11 of Resource Districts.

12 MR. WILMOTH: Tom Wilmoth, Blankenau and Wilmoth,  
13 Nebraska.

14 MS. FLAUTE: Carol Flaute, Nebraska Department of  
15 Natural Resources.

16 MS. SCHELLPEPER: Jennifer Schellpeper, Nebraska  
17 Department of Natural Resources.

18 MR. RILEY: Tom Riley with the Flatwater Group.

19 MR. TRAMBLY: Nelson Trambly, Lower Republican  
20 NRD.

21 MR. CLEMENTS: Mike Clements, General Manager of  
22 the Lower Republican NRD in Alma.

23 MR. Groff: Marc Groff, also with the Flatwater  
24 Group.

25 MR. SCHREUDER: Willem Schreuder, Principia

1       Mathematica.

2                   CHAIRPERSON DUNNIGAN: Thank you very much.  
3       Moving to Agenda Item 2, Adoption of the Agenda, are there  
4       any modifications to the proposed agenda?

5                   COMMISSIONER BARFIELD: None from Kansas.

6                   COMMISSIONER WOLFE: None from Colorado.

7                   COMMISSIONER BARFIELD: I would move adoption of  
8       the agenda.

9                   COMMISSIONER WOLFE: Second.

10                  CHAIRPERSON DUNNIGAN: It's been -- we've got a  
11       motion and a second for approval. All those in favor say  
12       aye.

13                  COMMISSIONER WOLFE: Aye

14                  COMMISSIONER BARFIELD: Aye.

15                  CHAIRPERSON DUNNIGAN: Aye. The agenda is  
16       approved and we'll move forward with the agenda as written.  
17       Agenda Item 3 is the Status of the Report of Transcripts for  
18       2013 Annual Meeting and Subsequent Special Meetings.

19                  Commissioner Barfield.

20                  COMMISSIONER BARFIELD: Thank you, Chairman  
21       Dunnigan. We are in the process of -- I believe the  
22       transcripts have been provided to the states and reviewed.  
23       It's my understanding are essentially in final form. We  
24       have an annual meeting and four special meetings to cover  
25       for the year. We have -- we're working through those right

1       now and I think we've distributed three of the Special  
2       Meetings. We're working through in chronologic order, and  
3       provided them to Colorado first. I think they've reviewed  
4       one of them, is my understanding, and passed it on to  
5       Nebraska, but we'll essentially have the -- we're going to  
6       finalize the final two and work through the review process,  
7       so that's the current status.

8               CHAIRPERSON DUNNIGAN: Thank you. Any questions?

9               (No response.)

10              Moving on to Agenda Item 4, which is the report,  
11      the Commissioners' Reports. And we'll start out with  
12      Kansas. Commissioner Barfield.

13              COMMISSIONER BARFIELD: Okay, thank you. My  
14      report this year will be fairly short. I normally report on  
15      climatic conditions. We've had a lot of extreme years in  
16      recent years. 2012 certainly was a very extreme, I think,  
17      year in all three states in terms of drought. That eased  
18      somewhat in the year 2013 that we're sort of reporting on  
19      this year and it's moderated even more in 2014, although we  
20      certainly still have areas where we're continuing to  
21      actively administer water in our state, including the  
22      Republican River Basin. One of our responsibilities is to  
23      administer for minimum desirable streamflows. And that  
24      administration continues on the Republican River this year.  
25      We administered through the first half of the year until

1 June 20, 196 water rights. Since June 20, we've actually  
2 been able to release administration of 128 files below  
3 Concordia, Kansas, so we're just administering 68 water  
4 rights, currently.

5 I don't have much of a legislative report this  
6 year. There was really no significant water legislation  
7 passed by the 2014 Legislature. This is due, in part, to a  
8 very significant ongoing effort that is going on in our  
9 state to develop a 50-year vision for the future of our  
10 water resources in Kansas. And I'm sure they're working  
11 through that process of gathering some grassroots ideas in  
12 terms of how we can afford our water management in the  
13 state. I would expect that we'll have more active  
14 legislation in the future, but nothing significant to report  
15 there.

16 Just a few brief comments on our efforts in terms  
17 of Compact activities. Kansas remains fully in compliance  
18 with the Republican River Compact. This is true with  
19 respect to all tests of compliance under the final  
20 settlement stipulation. This is also true with respect to  
21 Kansas' additional duties with respect to participation in  
22 the Compact business, as well as participating in the  
23 dispute resolution processes under the FSS.

24 I'll defer to Commissioner Wolfe to report on the  
25 RRCA's agreement reached last December with respect to



1 allowing Colorado's Compact Compliance Pipeline to operate  
2 this year, as well as the status of matters with respect to  
3 reaching an agreement on the CCP and Bonny issues, but we  
4 continue to work actively there.

5 Finally, I would note that the three states are  
6 currently engaged fully in some ongoing discussion aimed to  
7 improve our collective management of the basin's water  
8 resources and resolve pending disputes. I believe these  
9 discussions are heading in a very productive direction and  
10 we look forward to continuing in those discussions. And  
11 that's my report.

12 CHAIRPERSON DUNNIGAN: Thank you, Commissioner  
13 Barfield.

14 Commissioner Wolfe.

15 COMMISSIONER WOLFE: Thank you, Chairman. And  
16 first, I'd like to thank Nebraska for hosting the meeting  
17 this year. It's always great to get to Lincoln and see all  
18 the red again. So, thank you. The accommodations have been  
19 great. And so we appreciate it.

20 Also, I'd like to take this opportunity to thank  
21 my staff that's worked with me over the past year in our  
22 ongoing efforts for Compact compliance efforts. Ivan  
23 Franco, the Engineer Advisor; Mike Sullivan, my deputy.  
24 Dave Keeler and his staff in the basin have just really  
25 stepped it up in, not only this last year, but prior years.

1 A lot of activity ongoing in the basin in terms of  
2 enforcement efforts that I'll touch on, also, as well as a  
3 lot of the efforts that the district is doing as part of  
4 their efforts for Compact compliance. So, I appreciate  
5 that. I also appreciate the efforts of the engineer  
6 advisors who assist the commissioners. They've stepped it  
7 up this last year and have met more times, and I think that  
8 has really been productive in providing a lot of assistance  
9 to the commissioners. And you'll see that as part of their  
10 report today. I'd also like to thank Willem Schreuder, our  
11 consultant that not only assists Colorado, but also the RRCA  
12 and a lot of the modeling that's done within the Republican  
13 River Basin. I'd also like to thank the District. They're  
14 here today and they introduced themselves. And, of course,  
15 we couldn't do this without the District's help. It's been  
16 ten years now, since they've been formed. It's hard to  
17 believe how quickly that's gone. But I think Dennis Coryell  
18 will speak to the commissioners today and just kind of give  
19 you an update on some of their efforts and what they've been  
20 doing. And I'll mention some of that as well. But we work  
21 very closely with the District. It was created by the  
22 Legislature to assist Colorado in its Compact compliance  
23 efforts and they've really done a remarkable job with  
24 the -- over the last ten years in getting us there. We know  
25 we've still got some work to do, but we've come a long ways.

1           I'll just touch on the -- Commissioner Barfield  
2           had mentioned about the Compact Compliance Pipeline project  
3           that Colorado has brought forward to the Commission, and I  
4           do appreciate the approval from the commissioners this past  
5           December on that. It was a one-year temporary approval, but  
6           in accordance with that agreement, we have delivered, to  
7           date, in accordance with that agreement by April, 4,000 acre  
8           feet. We will be making a projection by September 1<sup>st</sup>, so  
9           here just within a few days, of what we anticipate we'll  
10          need to pump and deliver through the aug station into the  
11          North Fork for the remainder of this calendar year. But we  
12          look forward to working with Kansas and Nebraska over the  
13          next few weeks.

14                 As Commissioner Barfield indicated, we've had some  
15          ongoing efforts and involvement with the Secretary of  
16          Agriculture and others that we greatly appreciate and the  
17          direction that's headed. And it looks like we'll be working  
18          in the next few weeks on some temporary agreements to extend  
19          the operation of that pipeline as well as looking at a  
20          comprehensive settlement of the disputes between the states  
21          in the upcoming years. So, we're looking forward to working  
22          on that structure of that agreement here in the very near  
23          future.

24                 I'd like to just apprise everyone of some of the  
25          ongoing compliance efforts that Colorado continues to take

1 within the Republican River Basin. As you know, within that  
2 basin operates under a, kind of a set of different laws, and  
3 there are designated basin groundwater laws. And we  
4 continue as the Groundwater Commission, and I'm the  
5 Executive Director of that, to monitor and take appropriate  
6 enforcement actions on any overpumping within the basin.  
7 Now that we have metering in place, which became fully  
8 implemented with meters in 2009, we have been closely  
9 monitoring the amount of withdrawals from the wells. And in  
10 2012, as we know, was a dry year, we did have some pumping  
11 violations, which we took action on. I think in this past  
12 year, 2013, we only had three violations, and as best to our  
13 guesstimate to date, we don't anticipate any violations in  
14 2014, so we think that program is working very well.

15 The District continues to purchase surface water.  
16 There's a few left in the basin. As we know, the principal  
17 use of water in the basin is from groundwater diversions,  
18 but the District continues in their efforts -- conservation  
19 efforts on surface water buyouts, particularly on the South  
20 Fork of the Republican River Basin.

21 The District and the groundwater management  
22 districts in the basin have been working in this past year.  
23 They've established what they call a Water Preservation  
24 Partnership. It has ten members made up with representative  
25 from the management districts and the District and others,

1 representative user groups in the basin. They have made  
2 great strides. And I think in a lot of ways, have modeled  
3 some of the stuff that Kansas has done with LEMA and some of  
4 those things, and looking at conservation practices as they  
5 move forward into the future, looking at how they can best  
6 conserve and manage the limited resource. They've been very  
7 successful in their efforts in some of seeking funding for  
8 some grants from the Colorado Water Conservation Board on  
9 the order of \$450,000 -- \$458,000 (sic), approximately, to  
10 look at -- its funding for its study to look at the economic  
11 impacts as lands are taken out of production due to these  
12 conservation measures. We hope that that will not only be  
13 informative for Colorado, but others as well. And if that  
14 gets fully funded, which we anticipate it will, I think CSU,  
15 Colorado State University, will be taking the lead on that,  
16 those efforts. And Dr. Jim Pritchett has been a lead  
17 investigator in a lot of those economic impact studies in  
18 Colorado.

19 Also, the District, under Deb Daniel's leadership  
20 in working with other funding requests, they had submitted a  
21 request to the federal -- I'm not sure of the federal  
22 agency, exactly, but the Regional Conservation Partnership  
23 Program. Their proposal was submitted at -- at least passed  
24 through the first round out of several hundred that were  
25 done nationwide. If they do get funding for that, it's a

1 one-for-one matching grant of \$500,000 they're seeking that  
2 the District will match for a five-year study. And again,  
3 this is an effort in getting the conservation practices  
4 looking at fallowing, alternative cropping practices,  
5 deficit irrigation, changes in irrigation methods and so  
6 forth. So, that looks like it's on a good track and we wish  
7 them success or hope that they successfully get that  
8 approved here by the end of the year.

9 Just a quick note on some legislation that the  
10 General Assembly in Colorado passed this past year that  
11 deals with the designated groundwater basins. Under my role  
12 as State Engineer in Colorado, we've had enforcement  
13 authority and fining authority for water administration for  
14 a long time. The Legislature this year had adopted similar  
15 provisions in enforcement and fining authority to allow the  
16 local groundwater management districts to likewise seek  
17 those type of enforcement actions and fines. It was part of  
18 an effort -- it's been difficult for these local management  
19 districts to do that, because there wasn't a real funding  
20 source to do it. So, there's a mechanism now that if they  
21 were to move forward with their own respective enforcement  
22 actions to enforce their own local rules beyond what we have  
23 on the statewide level, for example, they can do that. But  
24 we are going to be working very closely with them. And to  
25 make sure we're not doing duplicate enforcement, that we

1 will coordinate, depending on who's taking the lead on any  
2 particular enforcement action. And again, it's just another  
3 recognition of the efforts that the local groundwater  
4 management districts and the Republican River Water  
5 Conservation District is doing to ensure that we live within  
6 our means and hopefully achieve Compact compliance.

7 And lastly, I'd just again like to just reiterate  
8 my appreciation of the cooperation here recently working  
9 with both Nebraska and Kansas and look forward to, in the  
10 upcoming months, trying to work through resolution on our  
11 remaining disputes that we thankfully now, hopefully have  
12 behind us through all the arbitrations. I hope that's in  
13 our past and not part of our future. And I look to work in  
14 a more cooperative manner and sitting down and rolling up  
15 our sleeves and getting these done. We know that that's  
16 kind of our responsibility as commissioners to represent the  
17 water users in the basin. So, thank you and look forward to  
18 working with you in the next year.

19 CHAIRPERSON DUNNIGAN: Thank you, Commissioner  
20 Wolfe.

21 CHAIRPERSON DUNNIGAN: The State of Nebraska is,  
22 again this year, in compliance with the Republican River  
23 Compact. Using current accounting procedures, Nebraska has  
24 had positive balances since 2007, which has led to  
25 compliance with the five-year averages. Based on

1 preliminary estimates, Nebraska will again be in compliance  
2 with the two-year and five-year period ending in 2014.  
3 Furthermore, Nebraska's compliance balances would be  
4 improved substantially by implementation of the modified  
5 accounting procedures recommended by Special Master Kayatta.

6 Nebraska's compliance efforts through 2014 have  
7 been substantial, affording Kansas' water users full access  
8 to Kansas' allocations. This has occurred as prescribed  
9 through implementation of the third generation integrated  
10 management plans, which contain forecasting provisions and  
11 controls that have ensured that Nebraska would take  
12 sufficient actions for Compact compliance in 2014.

13 The basin NRDs continue to demonstrate an ongoing  
14 commitment to compliance through their significant  
15 investment in programs and projects that will reduce and/or  
16 offset depletions in the basin. These include the  
17 augmentation project in Rock Creek, which provided for water  
18 for compliance in 2013 and 2014, and the N-CORPE  
19 augmentation project in Medicine Creek, which began  
20 operations in 2014. Other programs have included permanent  
21 and temporary retirement of surface and groundwater  
22 irrigated lands throughout the basin and leases of surface  
23 water.

24 The Department continues to look forward to  
25 working to assess various water management alternatives



1 through the WaterSMART Basin Studies program and utilize the  
2 tools that have been developed as part of this study to  
3 evaluate system improvements and operational improvements  
4 that can be made throughout the basin. Implementation of  
5 these system improvements will require partnerships with the  
6 irrigation districts, natural resources districts, and the  
7 Bureau of Reclamation. I do believe that through  
8 cooperation, these partnerships can lead to a more  
9 prosperous outcome for all Nebraska water users.

10 During the course of the 2014 Nebraska Legislative  
11 Session, a new water funding process was established. This  
12 new set of laws defines governance for administering the new  
13 Water Sustainability Fund. This fund represents a  
14 significant increase in funding for water projects aimed at  
15 addressing both water quality and water quantity issues  
16 across the state. The legislation also provides for  
17 additional basin-wide planning processes, which will include  
18 the Republican River Basin. These new planning processes  
19 will not displace the most recent IMPs, but will provide for  
20 greater stakeholder participation in integrated management  
21 planning and increase the feedback loop through these plans.  
22 The Department will soon begin working with NRDs and other  
23 stakeholders to develop the basin-wide plan for the Nebraska  
24 portion of the Republican River Basin.

25 The last year has seen Nebraska bring several

1 time-critical issues before the RRCA to be addressed.

2 Nebraska's efforts to resolve these issues have resulted in

3 arbitration hearings on three key issues. These issues

4 include implementation of the Rock Creek Augmentation Plan,

5 implementation of the N-CORPE Augmentation Plan, and the

6 implementation of the Alternative Water Short Year Plan.

7 The arbitrator's ruling on each of these three issues has

8 principally sided with Nebraska. However, subsequent to the

9 substantial efforts invested by Nebraska in the arbitration

10 process, Nebraska once again finds itself in a position

11 where Colorado has supported implementation of Nebraska's

12 proposals, and Kansas has not. Kansas' refusal to provide

13 Nebraska full credit for its augmentation projects or to

14 approve the Alternative Water Short Year accounting has been

15 a burden on Nebraska water users.

16 I am hopeful that recent efforts by the State of

17 Kansas to bring additional resources to bear on the

18 resolution of these key issues previously brought before the

19 RRCA will set a new path forward. As Commissioners of the

20 RRCA, we must exercise our duties to find solutions to such

21 issues and provide clear and transparent processes that each

22 state can utilize and depend on to resolve the concerns.

23 Not engaging in such efforts will likely put us on a path

24 for further litigation and diminish opportunities that would

25 otherwise be available to each state's water users. We

1       should be reminded of Special Master Kayatta's concluding  
2       remarks in his report to the United States Supreme Court in  
3       which he stated, "The issuance of this report also hopefully  
4       provides an occasion on which the states can resolve to  
5       proceed forward with greater consensus based on the  
6       knowledge that their interests in administering the waters  
7       of the basin will be more aligned."

8               With that, I'll turn it over to Jesse Bradley to  
9       provide an update from the field office perspective in  
10      Nebraska.

11             MR. BRADLEY: Thank you. During the 2013 calendar  
12      year, Department field office staff completed many on-site  
13      visits throughout the basin. Field office staff conducted  
14      approximately 440 reservoir compliance visits. These visits  
15      included installation of steel posts that are used as gages  
16      for water level in the reservoir, taking pictures at each  
17      site, and measurements of outlet works and dam height. All  
18      reservoirs under NDNR jurisdiction were inspected by the end  
19      of March of 2013. Many reservoirs received additional  
20      inspections throughout the year depending on rainfall across  
21      the area.

22             Field office staff also conducted approximately  
23      410 stream gage visits throughout 2013. During such visits,  
24      stream gage measurements were performed, gage heights  
25      recorded, and various equipment maintenance was done.

1 Monthly measurements are made at each of the 21 permanent,  
2 Department-operated, stream gaging stations. The Department  
3 also performs periodic stream gage measurements at USGS  
4 stations and many other seasonal stations in the basin.  
5 Field office staff conducted approximately 320 on-site water  
6 administration investigations. Water administration  
7 investigations include reading and recording flow meter  
8 values, recording crop and irrigation type, crop and  
9 irrigation system type, and streamflow, if necessary.

10 I'll now describe the details of the  
11 administrative actions carried out in support of water  
12 administration in 2013. Bear with me on this one. On  
13 January 1<sup>st</sup>, 2013, letters were sent out to all irrigation  
14 and storage permit holders notifying that a compact call  
15 year was in effect. Again, on January 1<sup>st</sup>, 2013, closing  
16 notices were mailed to all irrigation and storage permit  
17 holders above Guide Rock Diversion Dam. On January 14<sup>th</sup>,  
18 2013, letters were sent to irrigators reminding them that  
19 the 2012 water use reports must be filled out and filed with  
20 the Cambridge Field Office or that they would be closed for  
21 the entire 2013 calendar year.

22 On April 1<sup>st</sup>, 2013, four letters were mailed to  
23 the Bureau of Reclamation notifying them that they were  
24 required to release Compact water stored in the federal  
25 reservoirs. On May 1<sup>st</sup>, 2013, four letters were mailed to

1 the Bureau of Reclamation notifying them they were required  
2 to release Compact water stored through that period. On  
3 May 1, one letter was mailed to the Army Corps of Engineers  
4 notifying them that they were required to release Compact  
5 water stored in Harlan County Reservoir.

6 On June 25<sup>th</sup>, 2013, seven opening notices were  
7 issued to irrigators. On June 25<sup>th</sup>, 2013, four closing  
8 notices were issued to storage permit holders. On June 26,  
9 2013, nine opening notices were sent to irrigation permit  
10 holders. On June 26<sup>th</sup>, 2013, 86 closing notices were issued  
11 to storage permit holders. On June 28<sup>th</sup>, 2013, three  
12 opening notices were issued to irrigation permit holders.  
13 On June 28<sup>th</sup>, 2013, four closing notices were issued to  
14 storage permit holders.

15 On July 1<sup>st</sup>, 2013, 54 opening notices were issued  
16 to irrigation permit holders. On July 1<sup>st</sup>, 2013, 79 closing  
17 notices were issued to irrigators in the Republican Basin.  
18 On July 1<sup>st</sup>, 2013, 18 closing notices were mailed to storage  
19 permit holders notifying them that they could not raise the  
20 current water level in their reservoir. On July 24<sup>th</sup>, 2013,  
21 69 opening notices were sent to irrigation permit holders.  
22 On July 24<sup>th</sup>, 2013, 79 closing notices were issued to  
23 irrigation permit holders.

24 On September 1<sup>st</sup>, 2013, 160 closing notices were  
25 issued to irrigation and storage permit holders. On

1       September 3<sup>rd</sup>, 2013, three opening notices were issued to  
2       permit holders.

3               On December 9<sup>th</sup>, 2013, water use reports were  
4       mailed to all irrigation permits in the Republican Basin  
5       with the exception of federally owned canals. That  
6       completes my report.

7               CHAIRPERSON DUNNIGAN: Thank you, Jesse.

8               Are there any questions from any of the  
9       commissioners?

10              Commissioner Wolfe.

11              COMMISSIONER WOLFE: Thank you, Chairman. Just a  
12       point of clarification in my report. I may have misspoke on  
13       a funding as I'd indicated that the Republican River  
14       District had sought for this economic study. I may have  
15       said 458,000. I meant to say 150,000 and 158,000, they've  
16       already gotten approval for 8,000 and seeking an additional  
17       150-, and if I still have those numbers incorrect, I hope  
18       the District will in their reports or statements to the  
19       Commission correct me. But I misread that from my report.

20              CHAIRPERSON DUNNIGAN: Thank you, Commissioner  
21       Wolfe.

22              COMMISSIONER BARFIELD: Nothing from me, thank you  
23       for your reports.

24              CHAIRPERSON DUNNIGAN: Moving on to Agenda Item 5,  
25       which are the Federal Reports. We'll start out with the

1 Bureau of Reclamation. Aaron Thompson, you can come to the  
2 podium, please.

3 MR. THOMPSON: Thank you very much for allowing  
4 the Bureau of Reclamation to speak here at the Annual RRCA  
5 Conference. I'm Aaron Thompson, Area Manager for the  
6 Nebraska/Kansas Area Office of the Bureau of Reclamation.  
7 I've given each of the commissioners a copy of Reclamation's  
8 Annual Report. It contains the 2013 operational data for  
9 our reservoirs and the status update for each of our  
10 reservoirs as of July 31<sup>st</sup>, 2014.

11 I'll go through a few brief highlights through the  
12 report and the 2013 operation season. The federal  
13 irrigation districts in the basin suffered severe water  
14 shortages in 2013 as a result of Nebraska's 2013 compact  
15 call water right administration. Water deliveries averaged  
16 only 2.1 inches per acre in the Frenchman-Cambridge  
17 Irrigation District and nearly six inches in the Bostwick  
18 Irrigation District in Nebraska. Frenchman Valley & H&RW  
19 Irrigation Districts did not make any irrigation deliveries  
20 in 2013. Additional water shortages have continued into  
21 2014. Reclamation is concerned that the irrigation  
22 districts' financial viability is in jeopardy if this  
23 administration continues.

24 In addition, the operation and maintenance  
25 expenses of the federal dams are seeing significant

1 increases due to aging infrastructure. The district's  
2 ability to create a consistent revenue stream to repay their  
3 share of the federal project cost is limited without a  
4 reliable water supply. To ease some of the strain in the  
5 basin, Reclamation, in coordination with the State of  
6 Nebraska, executed an excess capacity contract with the  
7 Kansas Bostwick Irrigation District to temporarily store  
8 water in Harlan County Lake so water was available to the  
9 Kansas Bostwick Irrigation District during the irrigation  
10 season. Approximately 15,600 acre feet of inflows into  
11 Harlan County Lake were stored under this contract and  
12 released to Kansas Bostwick Irrigation District. A similar  
13 contract was executed with KBID in 2014. And I look forward  
14 to the continued collaboration between the states, not only  
15 with Nebraska and Kansas, but also Colorado, as we move  
16 forward with potential options to ease the strain in the  
17 basin for our water supplies.

18 Moving on to the WaterSMART Republican River Basin  
19 Study, the three states continue to work on this study.  
20 Nebraska and Kansas are currently completing ground and  
21 surface water models in the basin. Model development has  
22 proven more complicated than originally anticipated, so the  
23 team agreed to extend the study by one year. The final  
24 report will be completed in November of 2015 instead of  
25 November of 2014. Both structural and non-structural



1 options have been formulated. A draft engineering report  
2 was completed a couple weeks ago including cost estimates  
3 for multiple alternatives. We expect the report to be  
4 finalized very soon. All of these analyses, including model  
5 runs of the alternatives, will be completed by the end of  
6 the calendar year leaving 2015 to evaluate the findings and  
7 write the report.

8 Reporting for the Conservation Committee, the  
9 study is complete. A final study report dated June of 2014  
10 was transmitted to the RRCA members in July. This report  
11 replaces the report provided to the RRCA Annual Meeting in  
12 October of 2012. Conclusions in the final report have not  
13 changed from those presented in 2012. A PDF copy was also  
14 provided to each state representative on the Conservation  
15 Committee for making available on the states' websites.  
16 Some organization of the study data is in progress for  
17 archiving on Principia's website, which contains RRCA  
18 groundwater modeling data.

19 Moving to the far west portion of the basin, Bonny  
20 Reservoir, in January of 2014, Reclamation began  
21 negotiations with the State of Colorado to resolve the  
22 contract dispute regarding Bonny Dam. Under the current  
23 contract, Colorado Parks and Wildlife pays 23.7 percent of  
24 the annual operation and maintenance cost of Bonny Dam.  
25 Colorado's position has been that the original intent and

1       purpose of the current contract no longer exists since the  
2       reservoir has been drained.

3               And finally, an update on Red Willow Safety of  
4       Dams. The modification to the dam was substantially  
5       completed in December of 2013. Construction of a filter and  
6       drainage blanket along the downstream embankment began in  
7       December of 2011. And that concludes my report to the  
8       committee.

9               CHAIRPERSON DUNNIGAN: Questions from the  
10       commissioners?

11              COMMISSIONER BARFIELD: None from Kansas.

12              COMMISSIONER WOLFE: No.

13              CHAIRPERSON DUNNIGAN: US Army Corps of Engineers,  
14       Ken Stark, please.

15              MR. STARK: Good morning. I'm Ken Stark and glad  
16       to have Jim Bowen, the project manager at Harlan County here  
17       with us today. Glad to be here. It really means that we're  
18       making progress on the repairs at Harlan County Dam. Today  
19       I'll be talking a little bit about the dam itself and then  
20       going into the repairs that we're doing. Our stoplogs I'll  
21       talk about first and then the actual tainter gates, what  
22       we're doing with those gates, the irrigation stoplogs that  
23       we'll be building, and the sluice gate repairs, and then  
24       talk about the schedule.

25              Harlan County Dam was built from 1946 to 1952, and

1 so we're looking at a facility that's 62 years old. And  
2 most of the features out there are original, the original  
3 gates, the original controls, the original brakes on those  
4 gates, the chains that you see on these pictures, that's  
5 many-decades-old lifting chains. Harlan County, itself, has  
6 nine sluiceways. I like to think of them as tunnels,  
7 tunnels through the dam that release our normal water into  
8 the Republican River. Those nine sluiceways actually have  
9 two gates through each tunnel or through each conduit. So,  
10 there's 18 sluice gates. We have two irrigation conduits,  
11 the Franklin, which is five and a half feet wide diameter,  
12 and the Naponee, that's two foot and ten inches diameter on  
13 the south side of the dam. And then we have our tainter  
14 gates, our large 40- by 30-foot gates that are in the middle  
15 of the dam used for flood releases. Those gates, all 18 are  
16 restricted right now due to conditions of the bearing arm,  
17 the struts of the arm, the lifting chains, and actual -- the  
18 controls. Many of those controls are felled where they're  
19 completely useless, where we actually have to bypass those  
20 controls to try to operate gates. I'll talk more about that  
21 here in just a minute.

22 First phase of the repairs will be the stoplogs.  
23 As you can see by this photo, the brown algae growth on the  
24 gate, that's the typical or what we say would be the normal  
25 lake pool. So, the lake itself is maybe two and a half feet

1 up on those gates. And in order to release those gates, cut  
2 those bearing arms from the dam, you would need to have a  
3 bulkhead or stoplogs in place so the water doesn't push that  
4 gate down over the dam. So, really, the first phase of the  
5 repairs will be the stoplogs.

6 You can see our record low was 20.3 feet. That  
7 was back in December of 2004. Yesterday's water surface, we  
8 were about 15.3 feet low, so we're still -- the water is  
9 still low right now at Harlan County.

10 Tainter gate stoplogs, I mentioned this was really  
11 the first phase. And this is a current photo from this  
12 month out at Harlan County. You can see the work that's  
13 being done. Not only will there be anchors on the bottom of  
14 where those sluice gates are, but in between each bay,  
15 there's anchors being placed right now. And with the  
16 anchors, there's also, it's like concrete, a grout-like  
17 mixture that's added. Those will be used for the support  
18 beams and the guides where the stoplogs will be put in  
19 place. The stoplogs are essentially just metal sheets that  
20 are -- they look like H's. Their a form there and they  
21 represent a log, but essentially it's a metal I-beam. You  
22 can think of it that way.

23 The tainter gates, this is the back side of one of  
24 the 18 tainter gates that we have at Harlan County. And the  
25 bearing itself, this piece in here, was designed back in the

1 '40s without friction. The problem at Harlan County is  
2 there's lots of friction. Even though all of our brakes,  
3 they've been disconnected, usually, you would be able to  
4 raise a gate, put on the brakes to hold it in place, well,  
5 essentially, at Harlan County, you don't need brakes,  
6 because there is so much friction it holds the gate up. So,  
7 even though the brakes have failed and we don't have them  
8 right now in place, they're not needed, because of the poor  
9 bearing design. What we'll be doing is replacing those  
10 bearings with new retrofitted -- a trunnion that the whole  
11 fixture at the bottom of the gate will be replaced. That'll  
12 allow us to have a smooth operation where the gate won't  
13 stick. Right now, as you try to operate some of those  
14 gates, they stick. You don't want them to stick. It causes  
15 much problems with operation.

16 The arms themselves will be reinforced, too.  
17 We'll put in metal sheets just to give it more strength.  
18 There's concern right now with the high friction that many  
19 of those gates, if we tried to open them, those arms would  
20 probably bend. Those gates could get lodged in place.  
21 Essentially, maybe we'd be able to open those gates, but  
22 maybe not close them. So then, you would lose the water  
23 that's standing behind the normal pool. But, that's our  
24 concern with the gates and that's why we're repairing our  
25 gates.

1           Irrigation stoplogs, we have two conduits or  
2           sluiceways, but the dam itself was built without stoplogs.  
3           These have cast iron gates in there. They have never been  
4           inspected. There's much corrosion, much erosion seen around  
5           where we can actually see, but since there's not stoplogs,  
6           there's not a way to block off the water, we're not able to  
7           go in there and do a true, thorough inspection. But most  
8           likely, there would be some need to repair those gates.

9           Sluice gates, we talked about the nine passageways  
10          through the dam. This is sluiceway No. 1, and you see the  
11          water coming through there. These gates, through our  
12          inspection reports, our engineers just note that they need  
13          to be repaired, essentially taken out of the dam, weld  
14          repaired, blasted, painted, put back in place. Last time  
15          this was done was 1983, so it's been a long process.  
16          They're just sitting there. As I was looking through our  
17          old inspection reports, even years ago, it was needed  
18          through those reports, so it's a needed item that's been  
19          waiting.

20          Timeline, as you saw the dam itself, there's  
21          currently work at Harlan County Dam with those stoplogs. We  
22          have a contract awarded in September of 2013, and that work  
23          should be nearing up by the end of this calendar year.  
24          We're getting ready to repair -- issue a contract to do the  
25          tainter gate work, the lifting beams, all the new electrical

1 controls, the brakes that don't work, all the reinforcement  
2 on those arms and the bearings themselves. That contract is  
3 planned to be awarded next month, here in September, and  
4 then that's a three-and-a-half duration contract, so the  
5 next three and a half years, we will be working on those  
6 gates. Really, I want to emphasize that the stoplogs --  
7 we're taking -- it may take us longer to do it because of  
8 the stoplogs, but those stoplogs are needed, so we do not  
9 lower the Harlan County pool to make repairs. The Corps of  
10 Engineers has no plans, will not lower or release water to  
11 make repairs. That's why we're building the stoplogs. And  
12 that's why we're doing the extra effort. Even though it's  
13 taking longer, even though it's costing more, we will not  
14 release water to make these repairs.

15 If you happen to be at Harlan County during the  
16 next couple years, you'll notice with the construction, the  
17 road across the dam will be restricted at times down to one  
18 lane. So, definitely impact to local community and the  
19 economic impact there, too. So, something to be expected,  
20 but I think long term, this will give us the ability to have  
21 normal operations during flood control, any storm events.  
22 Currently, we've lost -- because of restrictions, we've lost  
23 54 percent of our flood control pool. The Kansas City  
24 District wants to get our dam back in full operation and  
25 wants to restore that flood capacity. Thank you.

1 CHAIRPERSON DUNNIGAN: Thank you, Ken.

2 Questions from the commissioners?

3 COMMISSIONER BARFIELD: I just appreciate your  
4 report. I'd like a copy of the presentation.

5 MR. STARK: Sure.

6 COMMISSIONER BARFIELD: That'd be helpful. This  
7 is -- obviously, we support having a safe and fully  
8 functional dam. Obviously, it's coming at a very  
9 significant price tag that our district bears part of the  
10 cost of, so, appreciate you also finding the most cost  
11 effective solutions to those -- to remedy these repair,  
12 maintenance concerns.

13 CHAIRPERSON DUNNIGAN: Thank you, Ken.

14 Next, the US Geological Survey, Jason Lambrecht.

15 MR. LAMBRECHT: Good morning. I'm not a  
16 microphone guy, but I speak loudly, so you'll hear me in  
17 this thing. I'm Jason Lambrecht. I'm with the US  
18 Geological Survey. I work out of the Nebraska Water Science  
19 Center out of Lincoln here. I just had to skip across town  
20 for this.

21 The USGS operates for the Compact 15 stream gages  
22 in Nebraska currently, I'll say on that. The funding is  
23 primarily through the Army Corps of Engineers, the US Bureau  
24 of Reclamation, the Nebraska DNR, and also through the  
25 National Streamflow Information Program. That's



1 congressionally allocated funding for stream gages. I  
2 passed out a report, somewhat of a report, to all the table  
3 personnel. There's some more copies up front. I won't go  
4 through the report. I'll just point out some of the  
5 highlights of the report from a spreadsheet.

6 Nine of the 15 gages that we operate for the  
7 Compact were in the top five lowest in this past year. It's  
8 very similar to the 2012. What we're talking about is water  
9 year 2013 right now, from October 1<sup>st</sup> of 2012 until  
10 September 30<sup>th</sup> of 2013. One of these stream gages had the  
11 highest on record at Rock Creek.

12 Over the past few months, I've been speaking with  
13 the Nebraska DNR and will be assuming operation of -- well,  
14 thanks to a bump in our NSF funding over the last year,  
15 we'll be assuming operation at two DNR stream gages in the  
16 Republican Basin, one being at the Beaver Creek and another  
17 one at Guide Rock. And then, we'll also be restarting a  
18 stream gage that shut down in 1994, Republican River at  
19 Benkelman. And those will all be starting up October 1<sup>st</sup>  
20 and will be available on the USGS webpage.

21 To date so far through water year 2014, all of our  
22 stream gages are work checked and approved. The data's  
23 available on the web up to around April of 2014. And beyond  
24 that, we worked all the data up to June-July with the  
25 current corrections put into the most recent measurements,

1 even up until the first part of August here. Then, I was  
2 just jotting some notes down to point out to everyone. All  
3 this data can be found on the USGS.water.ne.gov. And any  
4 USGS office can point you toward that website. The data  
5 available for all these sites is 15-minute values of data as  
6 well as daily information, statistics, and annual data  
7 reports for these sites.

8 The USGS North Platte Field Office maintains all  
9 these sites. They visit the sites at least every six weeks  
10 for calibration and maintenance of the gages and also to  
11 make discharge measurements for calibration of the state's  
12 discharge rating. They put special emphasis on high flows,  
13 the peaks of the year to assure that we adequately are able  
14 to shift to the peaks to make sure we have the right  
15 numbers, as well as the low flows of the year so that we  
16 also adequately cover the low flow range. And we make extra  
17 inspections when needed. Generally, it's around ten  
18 inspections a year, but it gets to be upwards of 14 to 16 a  
19 year.

20 Again, feel free to contact the USGS offices in  
21 your respective states to find out more information on any  
22 of the USGS stream gages in the Republican Basin. And if  
23 you have any questions, please do so. Otherwise, that ends  
24 my report.

25 CHAIRPERSON DUNNIGAN: Thank you, Jason.

1 Questions from the commissioners?

2 COMMISSIONER BARFIELD: None from Kansas.

3 COMMISSIONER WOLFE: Not from Colorado.

4 MR. LAMBRECHT: Thank you.

5 CHAIRPERSON DUNNIGAN: Thank you, Jason.

6 Moving to Agenda Item 6, Committee Reports, I'll  
7 turn it over to Jim Schneider for the Engineering Committee.

8 MR. SCHNEIDER: Thank you. We had a really  
9 productive year this year for the Engineering Committee.  
10 And we've delivered signed reports to the three states. And  
11 I will just go through the executive summary of that report.  
12 The Engineering Committee met five times since last  
13 September's Republican River Compact Administration Annual  
14 Meeting. Over the past year, the Engineering Committee  
15 completed these assignments. One, holding quarterly  
16 meetings; two, exchanging accounting data and documentation;  
17 three, discussing specific modeling and data tasks to be  
18 assigned to Principia Mathematica; four, discussing issues  
19 preventing agreement on final accounting from 2006 to 2012;  
20 five, discussing the establishment of the budget to  
21 accomplish tasks for Compact goals; and six, reviewing the  
22 task descriptions in each state's contract with Principia  
23 Mathematica.

24 Ongoing assignments include continuing efforts to  
25 resolve concerns related to varying methods of estimating

1 ground and surface water recharge and return flow and  
2 related issues; two, continuing efforts to finalize  
3 accounting for 2006 through 2012; three, discussing any  
4 accounting changes that may be needed for surface water  
5 diversion for the purpose of recharging groundwater; four,  
6 discussing developing an application and approval process  
7 for future augmentation plans; five, exploring options for  
8 sharing evaporation charges for Harlan County Lake when  
9 accounts exist separate from the project water supplies of  
10 Bostwick Irrigation District; six, exploring potential means  
11 to adjust the Compact accounting of Harlan County Lake for  
12 the mutual benefit of the states; and seven, exploring the  
13 development of an RFP to determine contractor options for  
14 the annual model update and model repository.

15 The Engineering Committee recommends discussion by  
16 the RRCA on the exchange of data and documentation in the  
17 modeling runs completed by Principia Mathematica for 2013,  
18 the establishment of a budget, the conservation terrace  
19 study, and the recommended Engineering Committee assignments  
20 for the following year.

21 That concludes my report. I'd be happy to answer  
22 any questions.

23 COMMISSIONER BARFIELD: I don't have any  
24 questions. I certainly appreciate the work of the committee  
25 and as well as your report. I think I concur it's been a

1 very productive year. For everyone else's benefit, we had a  
2 work session yesterday afternoon, where we sort of went  
3 through in detail, the committee's work and sort reviewed  
4 its assignments, and so, we're prepared to act on the  
5 report. Appreciate the work.

6 MR. SCHNEIDER: Thank you.

7 CHAIRPERSON DUNNIGAN: Thank you, Jim.

8 We'll move on to Agenda Item 7, Old Business, and  
9 I'll turn it back to Jim for a status of unapproved previous  
10 accounting.

11 MR. SCHNEIDER: Thank you. Well, as I noted in  
12 the Engineering Committee Report, one of the things we  
13 talked about are issues preventing the approval of previous  
14 unapproved accounting. We now have 2006 through 2013 that  
15 have yet to be approved. The data has been submitted and  
16 approved. We just haven't finalized the accounting. I  
17 think we've crystalized the remaining issues that need to be  
18 resolved. Several of them are involved in the Supreme Court  
19 litigation and several others are involved in arbitrations  
20 that have occurred. And there's just two other issues that  
21 the Engineering Committee will be working on throughout this  
22 year. And with resolution of the Supreme Court litigation  
23 and with the meetings that we're having and the hopeful  
24 resolution on augmentation plans and other accounting issues  
25 that have been arbitrated, we'll continue working towards

1 getting that in a final form for the RRCA to approve. Any  
2 questions?

3 COMMISSIONER BARFIELD: None from me, thank you.

4 MR. SCHNEIDER: Thank you.

5 CHAIRPERSON DUNNIGAN: Thank you, Jim.

6 Moving on to Agenda Item 8, which is New Business  
7 and Assignments to Compact Committees, I've asked the  
8 commissioners about Agenda Item (a). There are no issues  
9 that are raised at this point, so that takes care of Agenda  
10 Item (a).

11 Agenda Item (b) is Action on the Engineering  
12 Committee Report and Assignments, and I'd entertain a motion  
13 to approve the Engineering Report and assignments for the  
14 coming year.

15 COMMISSIONER WOLFE: I move that we approve the  
16 Engineering Committee Report and the associated assignments  
17 indicated therein.

18 CHAIRPERSON DUNNIGAN: Do I have a second?

19 COMMISSIONER BARFIELD: I would second.

20 CHAIRPERSON DUNNIGAN: A motion and a second. Any  
21 discussion?

22 (No response.)

23 Hearing none, all those in favor say aye.

24 COMMISSIONER BARFIELD: Aye.

25 COMMISSIONER WOLFE: Aye.

1                   CHAIRPERSON DUNNIGAN: Aye. Motion passes.

2                   Agenda Item 9 is Remarks from the Public, and I  
3 would appreciate it if you could come to the podium for the  
4 convenience of the court reporter to be able to hear you,  
5 for any public comments. Or we can try to bring the  
6 microphone out to the audience if you need, but we'll put  
7 the microphone at the podium for public comments, if there's  
8 any public comments.

9                   MR. CORYELL: I'm Dennis Coryell, President of the  
10 Republican River Water Conservation District in Colorado. I  
11 appreciate the opportunity to address the Compact  
12 Administration. First of all, I'd like to say thank you for  
13 the temporary approval to operate our augmentation plan and  
14 our Compact Compliance Pipeline for 2014. I know that these  
15 issues are not as simple as a farmer like myself would try  
16 to make them out to be. But I would just like to urge all  
17 three states to keep working in an agreeable manner and try  
18 to seek resolution of the remaining issues.

19                   I know that the subbasin impairment issue for  
20 Colorado's proposal seems to be a bit of an issue for,  
21 especially for Kansas. I would just like to say that, you  
22 know, Bonny Reservoir is dry. That was a very painful  
23 thing, maybe not necessarily for the folks in the  
24 remaining -- the other part of Colorado, Denver, but for Kit  
25 Carson and Yuma Counties, it was very painful. But it is

1 the one thing that allows us to be in compliance. So, I  
2 would just urge the three states to find a way in your  
3 accounting to represent Bonny Reservoir as dry, because it  
4 is dry.

5 We have, as mentioned from Commissioner Wolfe,  
6 we've spent a great amount of money within our district to  
7 assist Colorado in getting into compliance. Currently,  
8 we've spent over \$110 million in our district to get into  
9 compliance, and yet we do not have a permanent agreement so  
10 that we can be in compliance. We need to get past that.  
11 That \$110 million has retired over 37,000 acres, most of  
12 those permanent retirement, never to be irrigated again. I  
13 don't think that any of the other states have come anywhere  
14 close to doing that. That is our local commitment to comply  
15 with the Compact. We're truly serious, but we need  
16 approval. We've done that through CREP, EQIP, and AWEP, and  
17 now, we have a new program, the RCPP, Regional Conservation  
18 Partnership Program. We're, in the future, committing over  
19 the next five years, two and a half million dollars to  
20 partner with NRCS to do other kind of conservation programs,  
21 whether it be rotational fallowing, crops that require less  
22 water, several different methods to be able to actually  
23 conserve real water.

24 On July 28<sup>th</sup>, the Plains Groundwater Management  
25 District, one of the eight in the Republican River Basin in



1 Colorado, met to discuss with its water users, the producers  
2 in the area, what we could do to slow the decline of the  
3 Ogallala Aquifer. We basically recognized what Kansas was  
4 doing and kind of patterned our ideas and our thoughts as to  
5 what they're doing, because the reality is, other than a  
6 state boundary between us, we irrigate the same, we have the  
7 same issues, the same problems. In that meeting, our  
8 producers came up with the consensus that we do need to slow  
9 the decline of the aquifer in Colorado. We need to take  
10 steps to be able to do that. The producers said, we would  
11 rather be proactive and do that, lengthen the use of the  
12 aquifer for our irrigators within our basin and do that.

13 Now, anybody that's traveled throughout the basin,  
14 whether you're in Nebraska, Kansas, or Colorado, knows that  
15 things are greatly different from one area to the other.  
16 So, conservation in our district may look different for each  
17 groundwater management district. But the Plains District,  
18 which is probably on the southern perimeter of our basin,  
19 recognizes that at an alarming rate, our aquifer is  
20 declining. So, this is a proactive step. And there will be  
21 other meetings within our basin in the coming year or so  
22 with follow-up to be able to accomplish that goal.

23 In closing, I'd just like to say that it's great  
24 to hear Nebraska be able to say that you're in compliance  
25 for -- or you plan to be in compliance for this next year.

1 I've been attending these meetings since 1998. I want to  
2 retire. But I promised the water users in our basin that I  
3 would stay with this until we got the ship corrected. It  
4 would be nice for Colorado, in 2015, to say, "We are in  
5 compliance, and we will remain in compliance." So, I would  
6 just urge all three states -- I'm not saying you have to  
7 join hands and sing Kumbaya, but I would just urge you to  
8 keep moving forward in an agreeable manner to bring this  
9 issue to an end. Thank you very much.

10 CHAIRPERSON DUNNIGAN: Other public remarks?

11 (No response.)

12 Seeing none, that takes us to Agenda Item 10,  
13 which is future meeting arrangements. Nebraska will host  
14 next year's meeting again. We're currently planning for  
15 that meeting to be held in Lincoln, and we're looking at the  
16 afternoon of Wednesday, August 26<sup>th</sup> for the working session  
17 and the morning of August 27<sup>th</sup> for the RRCA meeting. And  
18 we'll certainly discuss that with the fellow states to make  
19 sure that we're in agreement on that, but those are the days  
20 that we put out today. Any questions?

21 (No response.)

22 Seeing none, that takes us to adjournment.

23 COMMISSIONER BARFIELD: Again, I'd like to -- as  
24 Commissioner Wolfe expressed earlier, just appreciate  
25 Nebraska hosting not only this morning's meeting but all of

1           yesterday. And I guess I would move adjournment.

2                       COMMISSIONER WOLFE: Second.

3                       CHAIRPERSON DUNNIGAN: Moved and seconded, no  
4 discussion. All those in favor? Aye.

5                       COMMISSIONER BARFIELD: Aye.

6                       COMMISSIONER WOLFE: Aye.

7                       CHAIRPERSON DUNNIGAN: Meeting adjourned. Thank  
8 you very much.

9                       (Whereupon, at 10:06 a.m. on August 28, 2014, the  
10 proceedings were concluded.)

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# EXHIBIT B

**ANNUAL MEETING OF THE  
REPUBLICAN RIVER COMPACT ADMINISTRATION**  
August 28, 2014

**Attendance**

<b>Name</b>	<b>Representing</b>
Brian Dunnigan	Nebraska Commissioner
Dick Wolfe	Colorado Commissioner
David Barfield	Kansas Commissioner
Jesse Bradley	Nebraska Department of Natural Resources
Jim Schneider	Nebraska Department of Natural Resources
Carol Flaute	Nebraska Department of Natural Resources
Jennifer Schellpeper	Nebraska Department of Natural Resources
Dave L. Keeler	Colorado Division of Water Resources
Ivan Franco	Colorado Division of Water Resources
Mike Sullivan	Colorado Division of Water Resources
Chris Beightel	Kansas Division of Water Resources
Sam Perkins	Kansas Division of Water Resources
Chelsea Erickson	Kansas Division of Water Resources
Justin Lavene	Nebraska Attorney General's Office
Burke Griggs	Kansas Attorney General's Office
Chris Grunewald	Kansas Attorney General's Office
Peter Ampe	Colorado Attorney General's Office
Mark Groff	Flatwater Group, Nebraska
Tom Riley	Flatwater Group, Nebraska
Mike Delka	Bostwick Irrigation District, Nebraska
Dustin Wilcox	Nebraska Association of Resources Districts
Tom Wilmoth	Blankenau and Wilmoth, Nebraska
Nelson Trambly	Lower Republican NRD, Nebraska
Mike Clements	Lower Republican NRD, Nebraska
John Thorburn	Tri-Basin NRD, Nebraska
Bob Merrigan	Middle Republican NRD, Nebraska
Brad Edgerton	Frenchman-Cambridge Irrigation District, Nebraska
Don Felker	Frenchman Valley Irrigation District, H&RW, Nebraska
Kenneth Albert	Frenchman Valley Irrigation District, Nebraska
Jerry Kotschwar	Frenchman Valley Irrigation District, Nebraska
Deb Daniel	Republican River Water Conservation District, Colorado
Dennis Coryell	Republican River Water Conservation District, Colorado
Willem Schrueder	Principia Mathematica
Donald Erickson	Self, Kansas
Jean Eichhorst	Self, Nebraska

Ken Stark	US Army Corps of Engineers
Jim Bowen	US Army Corps of Engineers, Harlan County Lake
Jason Lambrecht	USGS, Nebraska Water Science Center
Aaron Thompson	US Bureau of Reclamation
Craig Scott	US Bureau of Reclamation

## RRCA ANNUAL MEETING

Meeting Date: August 28, 2014

Place/Room: Auld Pavilion at Antelope Park, Lincoln, NE

Name:	Representing:	E-Mail:
Jesse Bradley	NDNR	
Brian Dunnigan	NDNR	
J. M.	NDNR	
Dave L. Kebr	CO DWR	
William Schreiner	Principix	
Ivan Franco	colorado DWR	
Dick Wolfe	colorado DWR	
Mike Sullivan	colorado DWR	
Burke Griggs	KS Atty Gen.	
Dave Barfield	Kansas	
Chris Beightel	KS-DWR	
Chris Grunewald	KS Atty Gen.	

## RRCA ANNUAL MEETING

**Meeting Date:** August 28, 2014

**Place/Room:** Auld Pavilion at Antelope Park, Lincoln, NE

Name:	Representing:	E-Mail:
Jennifer Schellpeper	NDNR	nebraska.gov jennifer.schellpeper@
Jasper Family	WRNRD	
MARC GROFF	NE	
Jim Bowen	Corps of ENGINEERS	JIM.D.BOWEN@ USACE.ARMY.MIL
Ken Stark	Corps of Engineers	Kenneth.A.Stark@ USACE.ARMY.MIL
John Thorburn	Tri-Basin NRD	jthorburn@tribasinrd.org
MIKE DELKA	Bostwick I.D. in Nebr.	
Sam Perkins	ICS KDA-DWR	sam.Perkins@kda.ks.gov
Jerry Kotschwa	Frenchman Valley Tr	
KENNETH ALBERT	Frenchman valley Tr	
Don Furr	Fr Valley H&RW	
Brad Edgerton	Frenchman-Cambridge I.D.	
Deb Daniel	RRUCD	
Peter Arny	RRUCD	
Jason Lambrecht	USGS	jmlambre@usgs.gov
Carol Flaute	NDNR	
Paul Koester	NDNR	



## RRCA ANNUAL MEETING

Meeting Date: August 28, 2014

Place/Room: Auld Pavilion at Antelope Park, Lincoln, NE

Name:	Representing:	E-Mail:
Aaron Thompson	Reclamation	a.thompson@usbr.gov
Jean Eichhorst		jean.eichhorst@ku.edu
Tom Riley	Flatwater Group	
Robert Merrigan	MRNPD	
McKen Sullivan	CDWR	
Jim Bowen	Corps of Engineers	Jim.D.BOWEN@USACE.ARMY.MIL
Sam Perkin	KS DWR	Sam.Perkin@kde.ks.gov
Craig Scott	U.S.B.R.	
Dustin Wilcox	NARD	dwilcox@NRWET.ORG
Donald + Chelsea Erickson	KS DWR	
Nelson + Nancy	LRNRD	
Mike Clement	LRNRD	
Dennis Coryell	RRWLD	
Debby Coryell	RRWLD	

# EXHIBIT C

AGENDA FOR  
**2014 ANNUAL MEETING OF THE  
REPUBLICAN RIVER COMPACT ADMINISTRATION**

August 28, 2014, 9:00 a.m. Central Time

Auld Pavilion at Antelope Park

1650 Memorial Drive

Lincoln, Nebraska

1. Introductions
2. Adoption of the Agenda
3. Status of Report and Transcripts for 2013 Annual Meeting and subsequent Special Meetings
4. Report of Chairman and Commissioners' Reports
  - a. Kansas
  - b. Colorado
  - c. Nebraska
5. Federal Reports
  - a. Bureau of Reclamation
  - b. U.S. Army Corps of Engineers
  - c. U.S. Geological Survey
6. Committee Reports
  - a. Engineering Committee
    - i. Assignments from 2013 Annual Meeting
    - ii. Committee recommendations to RRCA
    - iii. Recommended assignments for Engineering Committee
7. Old Business
  - a. Status of unapproved previous accounting
8. New Business and Assignments to Compact Committees
  - a. Issues raised by the States
    - i. Kansas
    - ii. Colorado
    - iii. Nebraska
  - b. Action on Engineering Committee Report and assignments
9. Remarks from the Public
10. Future Meeting Arrangements
11. Adjournment

# EXHIBIT D

# RECLAMATION

*Managing Water in the West*

## **Nebraska-Kansas Area Office**

### **Report**

### **To The**

### **Republican River**

### **Compact Administration**

**Lincoln, NE**



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

**August 28, 2014**

Bureau of Reclamation  
 Nebraska-Kansas Area Office

Republican River Compact Administration  
 August 28, 2014

## REPUBLICAN RIVER COMPACT MEETING

August 28, 2014  
 Lincoln, Nebraska

### 2013 Operations

As shown on the attached Table 1, precipitation in the Republican River Basin varied from 103 percent of normal at Lovewell Reservoir to 64 percent of normal at Hugh Butler Lake. Total precipitation at Reclamation project dams ranged from 12.63 inches at Red Willow Dam to 28.20 inches at Lovewell Dam.

Inflows varied from 16 percent of the most probable forecast at Bonny Reservoir to 82 percent of the most probable forecast at Harry Strunk Lake. Inflows into Bonny Reservoir totaled 1,780 AF while inflows at Harlan County Lake totaled 48,794 AF.

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

<u>District</u>	<u>Farm Delivery</u>
Frenchman Valley	0.0 inches
H&RW	0.0 inches
Frenchman-Cambridge	2.1 inches
Almena	2.7 inches
Bostwick in NE	5.9 inches
Kansas-Bostwick	9.2 inches

### 2013 Operation Notes

**Bonny Reservoir** – Remained empty at elevation 3638.00 feet, 34.0 feet below the top of conservation. The annual computed inflow totaled 1,780 AF and was the lowest ever recorded at this site. Reservoir inflows were bypassed the entire year as ordered by the State of Colorado.

**Note** - The Nebraska Department of Natural Resources declared a Compact Call Year on the Republican River Basin on January 1, 2013 and issued storage closing notices on Reclamation reservoirs in the Basin. All water impounded in Swanson Lake, Enders Reservoir, Hugh Butler Lake and Harry Strunk Lake from January 1<sup>st</sup> through April 30<sup>th</sup> was released by May 15, 2013. Water impounded after April 30<sup>th</sup> was considered legally stored by DNR on December 31, 2013, under the corresponding water right.

**Enders Reservoir** – Started the year at elevation 3090.71 feet, 21.6 feet below the top of conservation. The 2013 computed inflow totaled 4,126 AF. The reservoir level increased only slightly to a peak elevation of 3091.22 feet on March 31<sup>st</sup>. A total of 566 AF was released in April and May for compact compliance. Due to the extremely low available water

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supply, no water was released from Enders Reservoir for irrigation. This was the twelfth consecutive year that H&RW Irrigation District did not divert water. It was also the tenth consecutive year that storage releases were not made for Frenchman Valley Irrigation District. The end of the year reservoir level was 23.8 feet (3088.55 feet) below the top of conservation.

**Swanson Lake** – Started the year at elevation 2732.41 feet, 19.6 feet below the top of conservation. The annual computed inflow totaled 19,498 AF. This includes approximately 11,000 AF from the Rock Creek augmentation project. A total of 7,292 AF was released to the river in April and May for compact compliance. A peak elevation of 2734.19 feet (17.8 feet below the top of conservation) was reached on May 2<sup>nd</sup>. The reservoir level decreased during the irrigation season reaching elevation 2729.51 feet on August 30<sup>th</sup>. The district diverted 9,210 AF into Meeker-Driftwood Canal from June 26<sup>th</sup> through August 30<sup>th</sup>. At the end of the year the reservoir level was 22.6 feet below the top of conservation at 2729.45 feet.

**Hugh Butler Lake** – Started the year at elevation 2553.63 feet, 28.2 feet below the top of conservation. The 2013 computed inflow was 8,735 AF. The reservoir level gradually increased to a peak elevation of 2556.81 feet on April 2<sup>nd</sup>. A total of 4,315 AF was released from the reservoir in April and May for compact compliance. No irrigation releases were made from Hugh Butler Lake in 2013. The elevation at the end of the year was 2555.06 feet, 26.7 feet below the top of conservation.

**Harry Strunk Lake** – Started the year at elevation 2355.97 feet, 10.1 feet below the top of conservation. The annual computed inflow totaled 31,563 AF. The reservoir level gradually increased to elevation 2361.81 feet on April 2<sup>nd</sup>. A total of 10,902 AF was released in April and May for compact compliance. Irrigation releases dropped the reservoir level to elevation 2349.87 feet on September 2<sup>nd</sup>. The district diverted 12,575 AF into Cambridge Canal. Late fall and early winter inflows increased the level of Harry Strunk Lake to 9.8 feet below the top of conservation at the end of the year (2356.34 feet).

**Keith Sebelius Lake** – Started the year at elevation 2293.97 feet, 10.3 feet below the top of conservation. The total 2013 computed inflow was 4,705 AF. The reservoir level slowly increased to an elevation of 2294.63 feet on May 19<sup>th</sup>. Irrigation releases were made during June and July reducing the lake level by 2.6 feet. The reservoir level continued to gradually decrease the remainder of the year and ended at an elevation of 2290.78 feet (13.5 feet below the top of conservation). A total of 2,274 AF was diverted into Almena Canal.

**Harlan County Lake** – Started the year at elevation 1935.28 feet, 10.5 feet below the top of conservation. The 2013 computed inflow totaled 48,794 AF. This includes the water that was bypassed from the upstream reservoirs. A total of 7,765 AF was released from the reservoir in May for compact compliance. The lake level peaked at elevation 1937.55 feet on June 12<sup>th</sup>. Irrigation releases started June 12<sup>th</sup> and continued through September 10<sup>th</sup> decreasing the pool level to elevation 1930.09 feet. Bostwick Irrigation District in Nebraska diverted 24,476 AF in 2013. Kansas Bostwick Irrigation District entered into an Excess Capacity Contract (Warren Act Authority) with Reclamation for the use of “Compact Call” water stored in Harlan County Lake in 2013. A total of 5,500 AF was released under this contract during the irrigation season and an additional 10,098 AF was released in November and December. The reservoir elevation was 1927.85 feet (17.9 feet below the top of conservation) on December

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31, 2013. A ten year summary of Harlan County Lake operations is shown on Table 3.

**Lovewell Reservoir** – Started the year at elevation 1577.60 feet, 5.0 feet below the top of conservation. The annual computed inflow total for 2013 was 47,037 AF. Republican River diversions were made via the Courtland Canal into Lovewell Reservoir from January through mid-April and resumed in early May. The pool level gradually increased to elevation 1584.11 feet on June 5<sup>th</sup>. Releases to the canal began on June 3<sup>rd</sup> and continued through September 11<sup>th</sup>. The reservoir elevation at the end of the irrigation season was 1572.02 feet. Republican River flow was diverted via Courtland Canal into Lovewell Reservoir from late November through the end of December. The Kansas Bostwick Irrigation District diverted a total of 60,232 AF in 2013. A total of 40,139 AF was released into Courtland Canal from Lovewell Reservoir. The reservoir level at the end of the year was 1577.56 feet (5.0 feet below top of conservation).

### **Current Operations (As of 7/31/14)**

**Bonny Reservoir** – The reservoir is currently empty. Inflows continue to be bypassed through the reservoir as ordered by the State of Colorado. Approximately 596 AF has been released into Hale Ditch in 2014. Bonny Dam has recorded 13.43 inches of precipitation during the first seven months of the year (115% of average).

**Note** - The Nebraska Department of Natural Resources declared a Compact Call Year on the Republican River Basin on January 1, 2014 and issued storage closing notices on Reclamation reservoirs in the Basin. The compact call remains in place.

**Enders Reservoir** - The reservoir level is 29.9 feet below full and 7.3 feet below last year at this time. Enders Dam recorded 13.48 inches of precipitation during the first seven months of the year (104% of normal). Due to the water supply shortage, H&RW Irrigation District is not irrigating for the thirteenth year in a row. This is also the eleventh consecutive year that Frenchman Valley Irrigation District has not received storage water for irrigation. In May of 2014, 4,380 AF of storage water was reassigned to the Kansas Bostwick Irrigation District and subsequently diverted from the reservoir. This reassignment resulted from an agreement reached by the Frenchman Valley and H&RW Irrigation Districts with the Middle Republican Natural Resource District to release the water for compact compliance.

**Swanson Lake** – The lake level is 23.6 feet from full and is 2.8 feet below last year at this time. Precipitation for the year is at 94% of normal (12.65 inches). Irrigation releases made in 2014 have been significantly reduced as a result of the compact call placed on the Republican River by the Nebraska Department of Natural Resources.

**Hugh Butler Lake** – The lake level is currently 26.7 feet below full and is 1.1 feet above last year at this time. The precipitation total so far this year is 12.10 inches (94% of normal). Irrigation releases are not being made from Hugh Butler Lake this season.

**Harry Strunk Lake** – The lake level is currently 8.6 feet below the top of conservation.



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Precipitation at the dam during the first seven months of the year was 17.61 inches (128% of normal). Irrigation releases have been limited during 2014 due to the compact call. The lake level is currently 3.0 feet above last year at this time.

**Keith Sebelius Lake** – Currently 15.4 feet below full. Lake level is 2.7 feet below last year at this time. Irrigation releases were limited during 2014 due to a short water supply. Precipitation at the dam during the first seven months of the year was 13.91 inches (86% of normal).

**Harlan County Lake** – The current water surface level is approximately 13.2 feet below full. The lake level is 0.7 feet below last year at this time. Harlan County Dam has recorded 11.26 inches of precipitation so far this year (76% of normal). Only 6,130 AF of project water was available for irrigation on June 30, 2014. An additional 52,800 AF of water was available for Kansas Bostwick Irrigation District use as a result of the district entering an Excess Capacity Contract (Warren Act Authority) with Reclamation. It was determined that “Water-Short Year Administration” would be in effect.

**Lovewell Reservoir** – The reservoir level is currently 4.1 feet below the top of conservation and 0.7 feet above last year’s elevation at this time. Lovewell Dam recorded 17.49 inches of precipitation during the first seven months of the year (102% of average). Irrigation demands were low in late June due to the wet and cool conditions in the district.

A summary of data for the first seven months of 2014 is shown on Table 2.

### Other Items

**Excess Capacity Contract** – Harlan County Lake – An Excess Capacity Contract (Contract) was executed with Kansas Bostwick Irrigation District (KBID) to temporarily store inflows into Harlan County Lake under the State of Nebraska’s Compact Call water right administration. This contract allowed water to be temporarily stored for KBID’s use during the irrigation season. All of the water remaining under this Contract at the end of the 2013 irrigation season was later released under the direction of KBID for diversion into Lovewell Reservoir. A similar Contract was executed for 2014 as a result of Nebraska’s 2014 Compact Call.

**Conservation Committee** – Impacts of Non-Federal Reservoirs and Land Terracing on Basin Water Supplies – A final study report, dated June 2014, was transmitted to the Republican River Compact Administration (RRCA) members in July 2014. This study was approved by the RRCA on July 27, 2014 and completed on their behalf.

**Safety of Dams** – Red Willow Dam – Reconstruction related to the Safety of Dams Modification at Red Willow Dam was substantially completed in December 2013. Construction and repair operations began in December 2011 of a filter and drainage blanket along the downstream embankment and installation of a new toe drain system. In addition, the contract was modified to include stabilizing the access road, paving the dam crest and

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repaving the access road.

**WaterSMART Basin Study Program** - The States of Colorado, Nebraska, and Kansas and the U.S. Department of the Interior, Bureau of Reclamation are continuing work on the Republican River Basin Study. Both Nebraska and Kansas are currently completing ground and surface water models in the basin and finalizing model calibrations. The study team agreed to extend the study by one year, so the final report will be completed in November 2015 instead of November 2014. All of the analyses, including model runs of alternatives, climate change analysis, and economics analysis, will be completed by the end of the calendar year, leaving 2015 to evaluate findings and completion of the final report.

**TABLE 1**  
**NEBRASKA-KANSAS PROJECTS**  
**Summary of Precipitation, Reservoir Storage and Inflows**  
**CALENDAR YEAR 2013**

Reservoir	Total	Percent Of	Storage	Storage	Gain or	Maximum	Storage	Minimum	Storage	Total	Percent
	Precip.	Average	12-31-12	12-31-13	Loss	Content	Date	Content	Date	Inflow	Of Most
	Inches	%	AF	AF	AF	AF		AF		AF	Probable
											%
Box Butte	17.14	101	8,308	8,807	499	12,981	MAY 19	5,705	AUG 29	10,096	62
Merritt	20.92	102	61,370	60,831	-539	67,602	MAY 23	42,929	SEP 13	184,211	100
Calamus	25.08	104	87,136	100,449	13,313	123,054	APR 15	61,540	SEP 23	258,881	94
Davis Creek	28.42	115	18,954	9,501	-9,453	31,812	MAY 30	9,320	SEP 30	47,965	125
Bonny	14.02	82	0	0	0	0	N/A	0	N/A	1,780	16
Enders	15.26	80	15,122	13,320	-1,802	15,573	MAR 31	13,153	NOV 3	4,126	43
Swanson	15.71	79	37,797	28,877	-8,920	41,665	MAY 2	27,376	NOV 3	19,498	64
Hugh Butler	12.63	64	6,098	6,961	863	8,094	APR 2	5,764	MAY 15	8,735	62
Harry Strunk	17.79	86	19,939	20,382	443	27,617	APR 2	13,447	SEP 2	31,563	82
Keith Sebelius	20.90	85	16,462	12,502	-3,960	17,372	MAY 19	12,468	NOV 28	4,705	53
Harlan County	17.46	77	191,125	124,522	-66,603	215,031	JUN 12	124,523	DEC 31	48,794	35
Lovewell	28.20	103	22,585	22,495	-90	40,349	JUN 5	12,127	SEP 11	47,037	69
Kirwin	17.77	75	66,348	50,011	-16,337	72,279	MAY 19	49,942	DEC 6	13,132	39
Webster	19.28	81	36,167	16,537	-19,630	37,236	MAY 19	16,505	DEC 7	5,120	19
Waconda	21.22	83	184,545	187,122	2,577	200,660	AUG 7	185,103	JAN 1	60,291	34
Cedar Bluff	16.08	77	66,233	54,342	-11,891	66,365	JAN 2	54,343	DEC 30	5,605	30

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

**JANUARY - JULY 2014**

Reservoir	Precip. Inches	Percent Of Average %	Storage 7/31/2013 AF	Storage 7/31/2014 AF	Gain or Loss AF	Inflow AF	Percent Of Most Probable %
Bonny	13.43	115	0	0	0	1,782	24
Enders	13.48	104	14,283	8,961	(5,322)	4,287	82
Swanson	12.65	94	33,333	26,312	(7,021)	25,124*	110
Hugh Butler	12.10	94	6,274	6,961	687	6,828	76
Harry Strunk	17.61	128	18,240	21,758	3,518	35,471*	144
Keith Sebelius	13.91	86	13,379	10,474	(2,905)	3,052	51
Harlan County	11.26	76	170,539	164,168	(6,371)	73,703**	83
Lovewell	17.49	102	23,062	24,627	1,565	27,323	64

\* Includes inflow from augmentation (pumping) projects.

\*\* Includes the water bypassed from the upstream reservoirs.

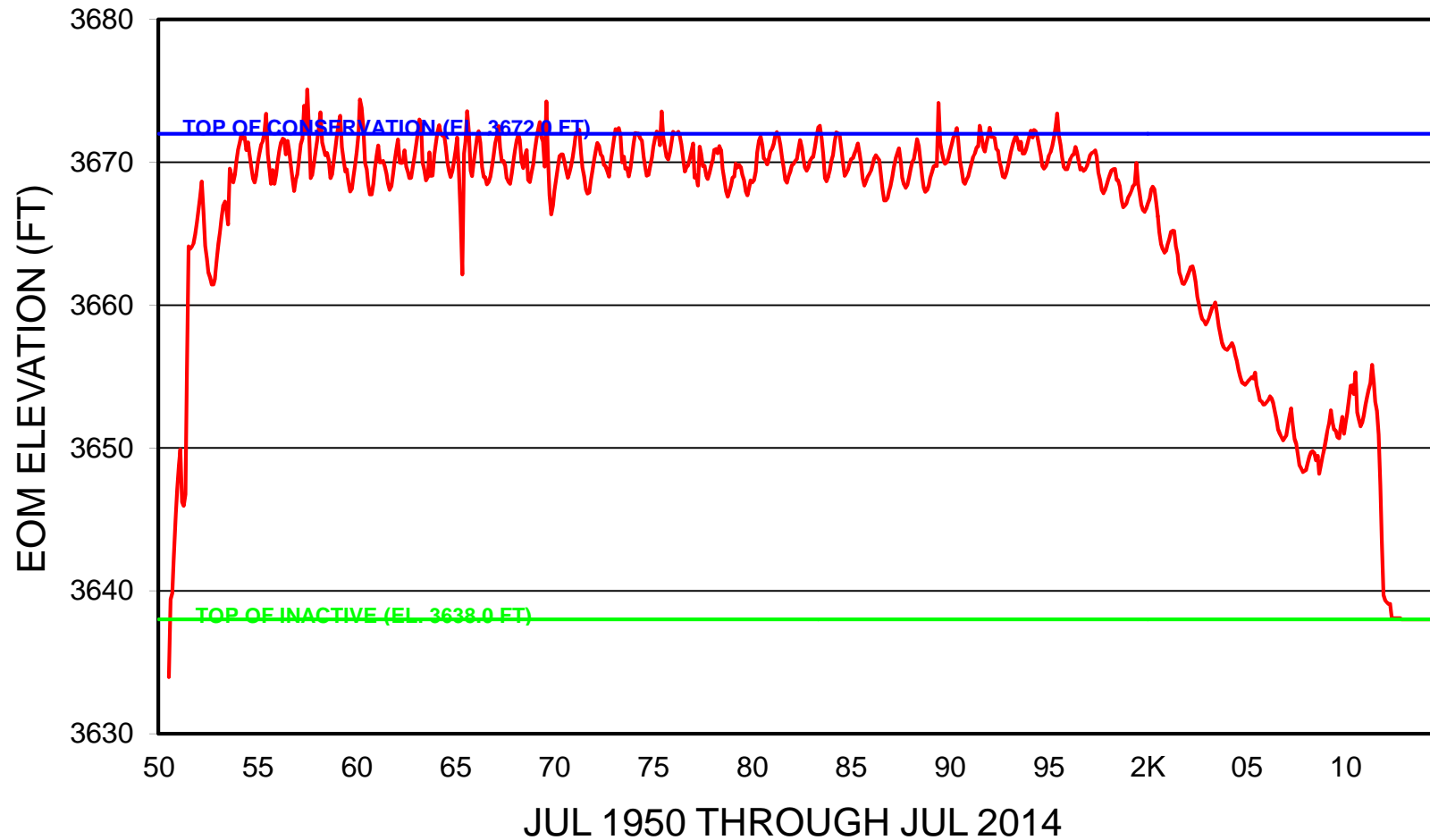
**TABLE 3  
HARLAN COUNTY LAKE**

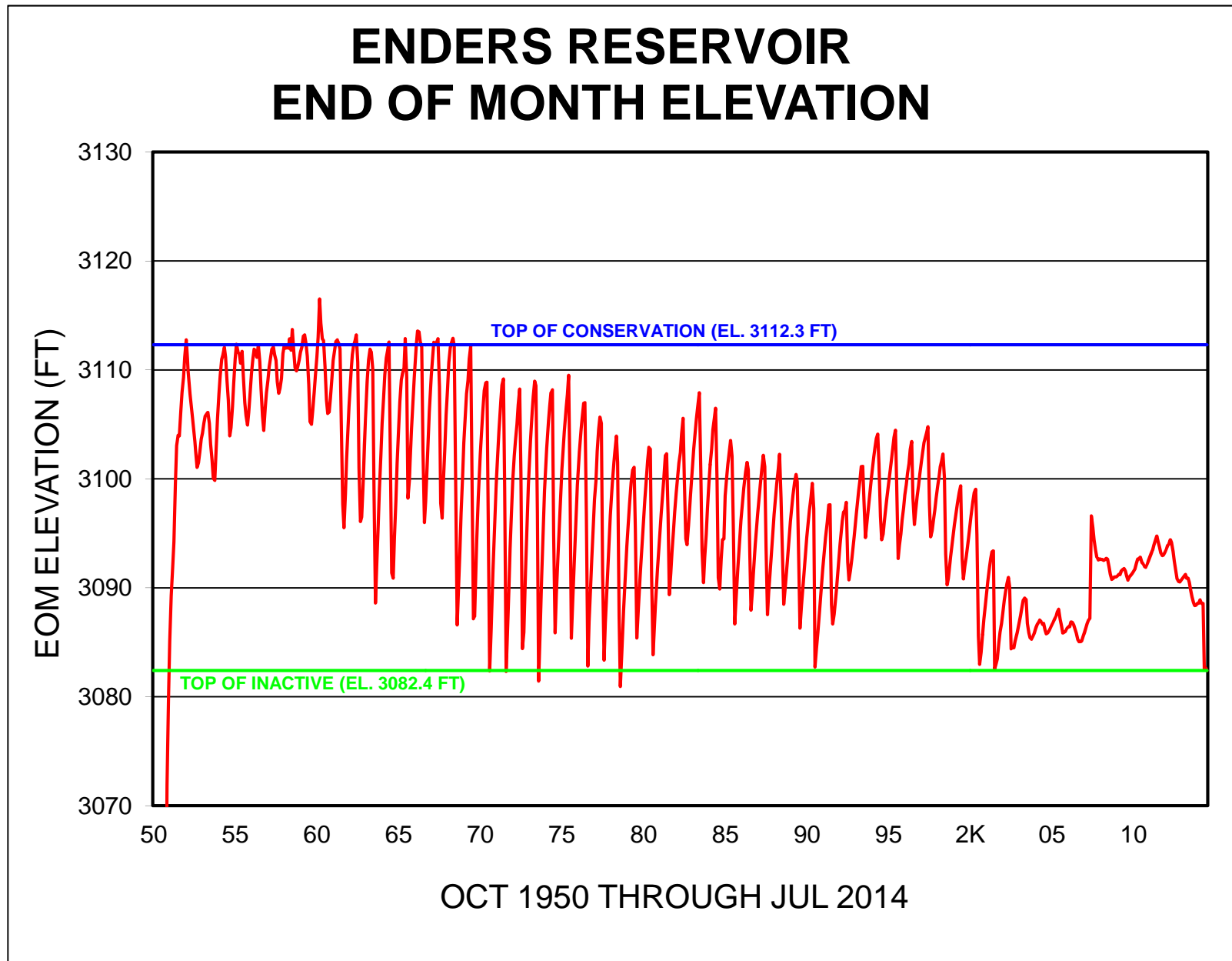
Year	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	Precip. (% of Average) (22.76 inches)	Rep. Basin Reclamation Dams (% of Average)	End of Year Content (AF)	Projected Irrig. Water Supply On June 30th (AF)
2004	25,099	0	30,601	22.83	100%	111%	107,050	<b>0</b>
2005	53,682	0	32,620	22.51	99%	107%	128,111	<b>14,100</b>
2006	30,077	12,280	29,609	20.62	91%	101%	116,299	<b>14,400</b>
2007	198,528	21,237	38,197	26.92	118%	114%	255,393	<b>111,700</b>
2008	224,841	114,938	45,985	30.31	133%	131%	319,311	<b>175,900</b>
2009	136,747	94,079	41,721	24.50	108%	128%	320,258	<b>156,000</b>
2010	239,054	194,055	46,893	31.66	139%	119%	318,364	<b>147,800</b>
2011	174,830	120,989	49,241	30.69	135%	115%	322,964	<b>157,700</b>
2012	78,581	160,221	50,199	18.14	80%	64%	191,125	<b>132,900</b>
2013	48,794	75,355	40,042	17.46	77%	83%	124,522	<b>81,400*</b>

\* Includes 54,400 AF of project water and 27,000 AF of water stored under an Excess Capacity Contract with KBID.

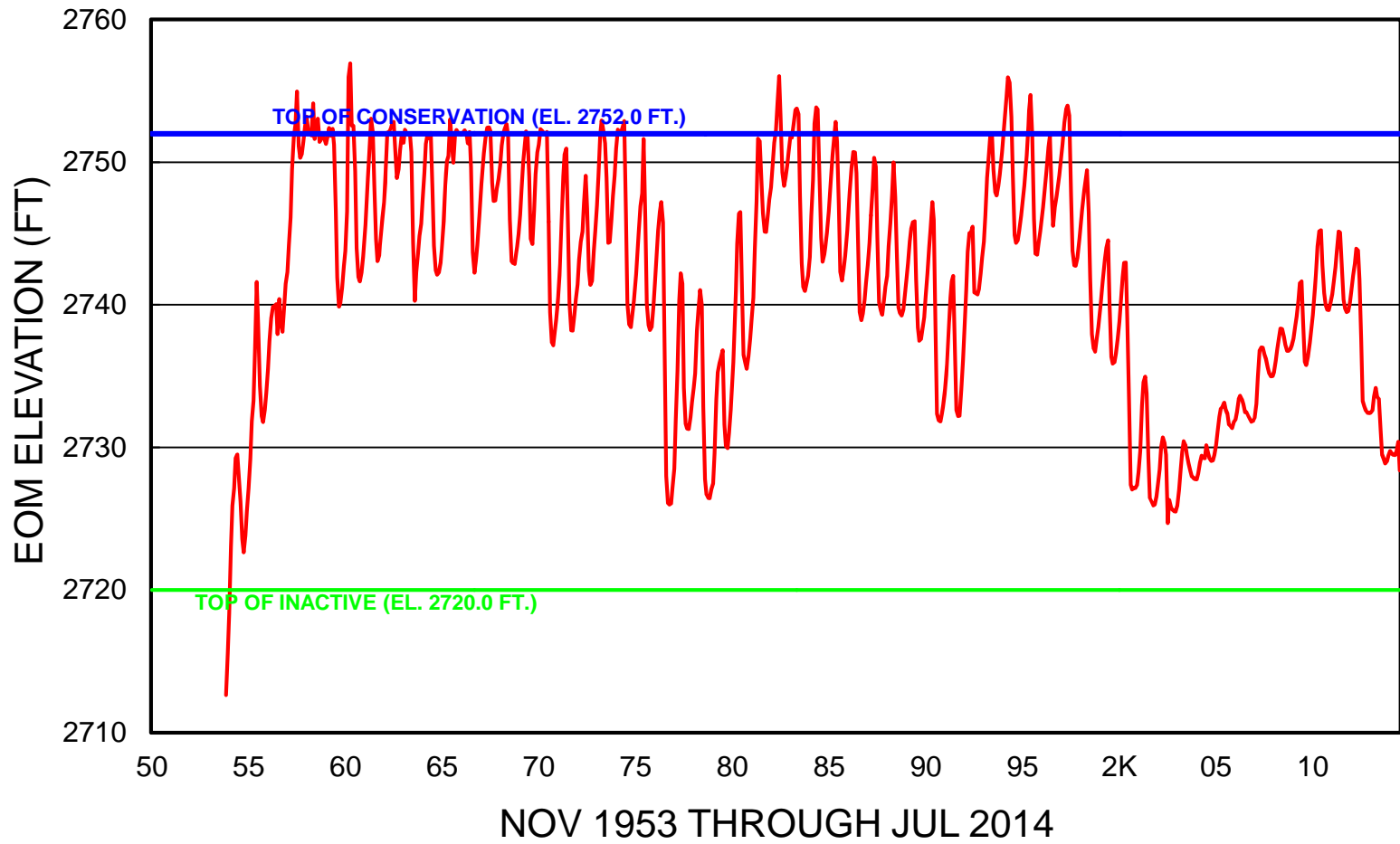
\*\*NOTE: On June 30, 2014, the Projected Irrig. Water Supply included 6,130 AF of project water and 52,840 AF of water stored under an Excess Capacity Contract with KBID.

# BONNY RESERVOIR END OF MONTH ELEVATION



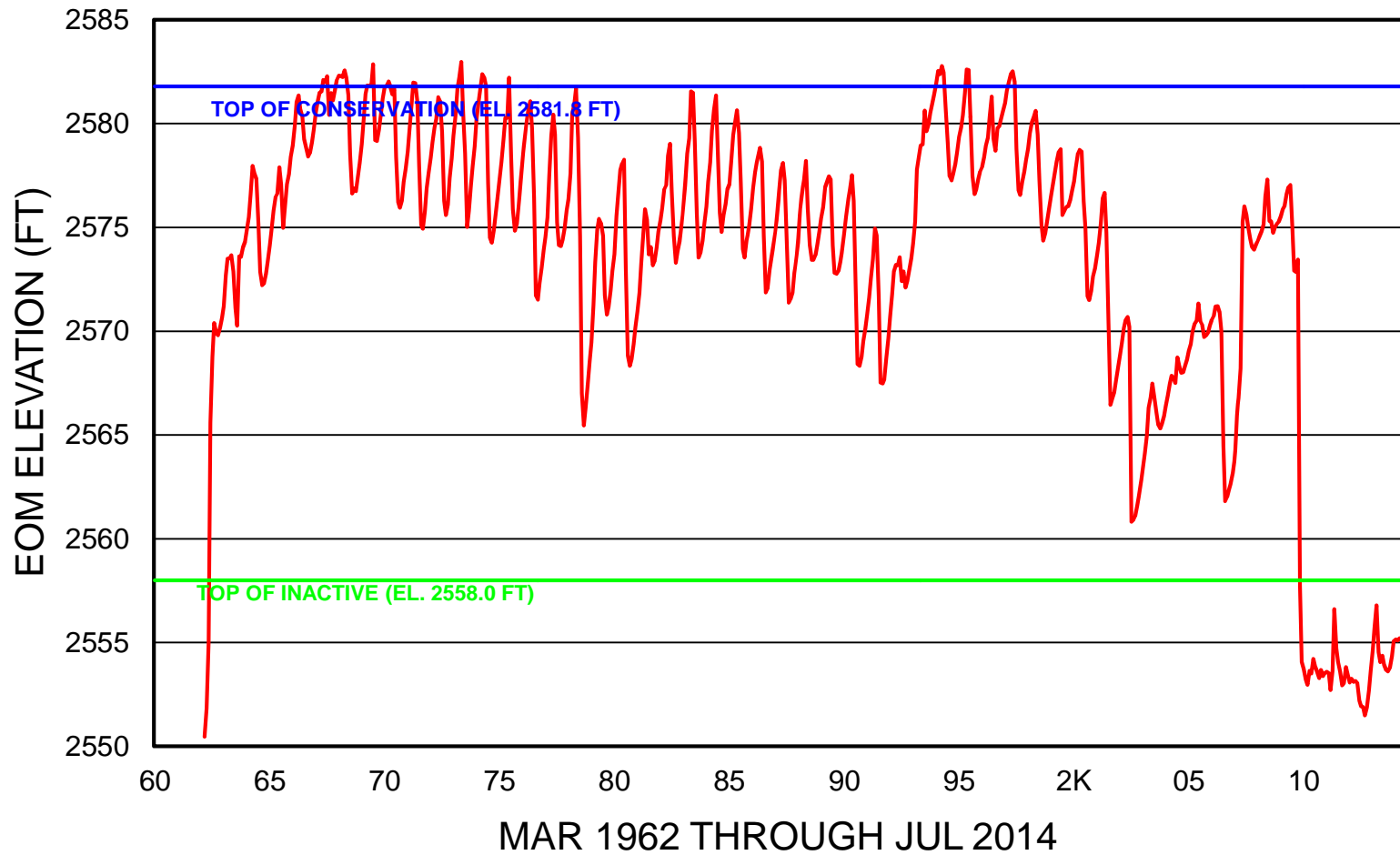


# SWANSON LAKE END OF MONTH ELEVATION

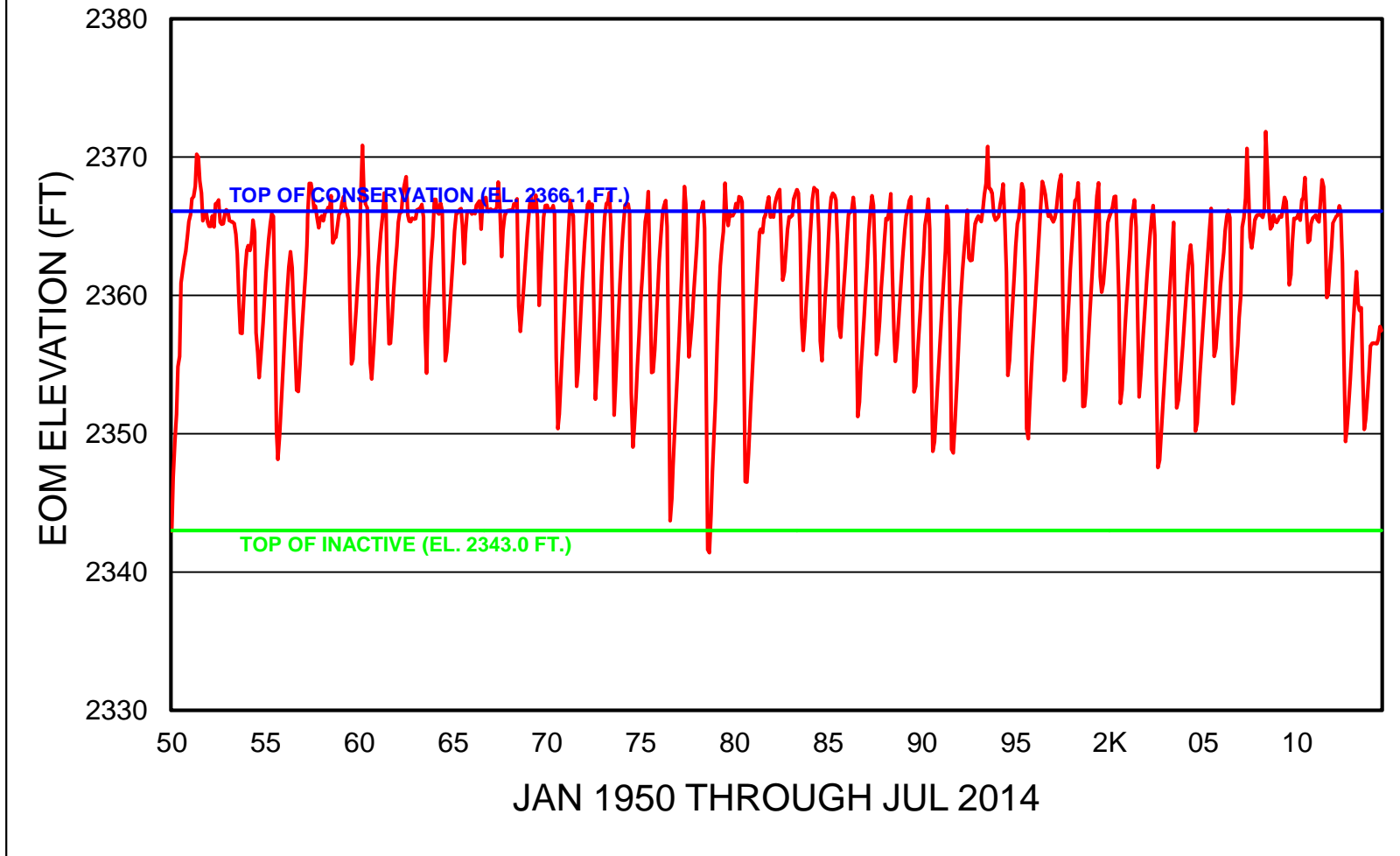




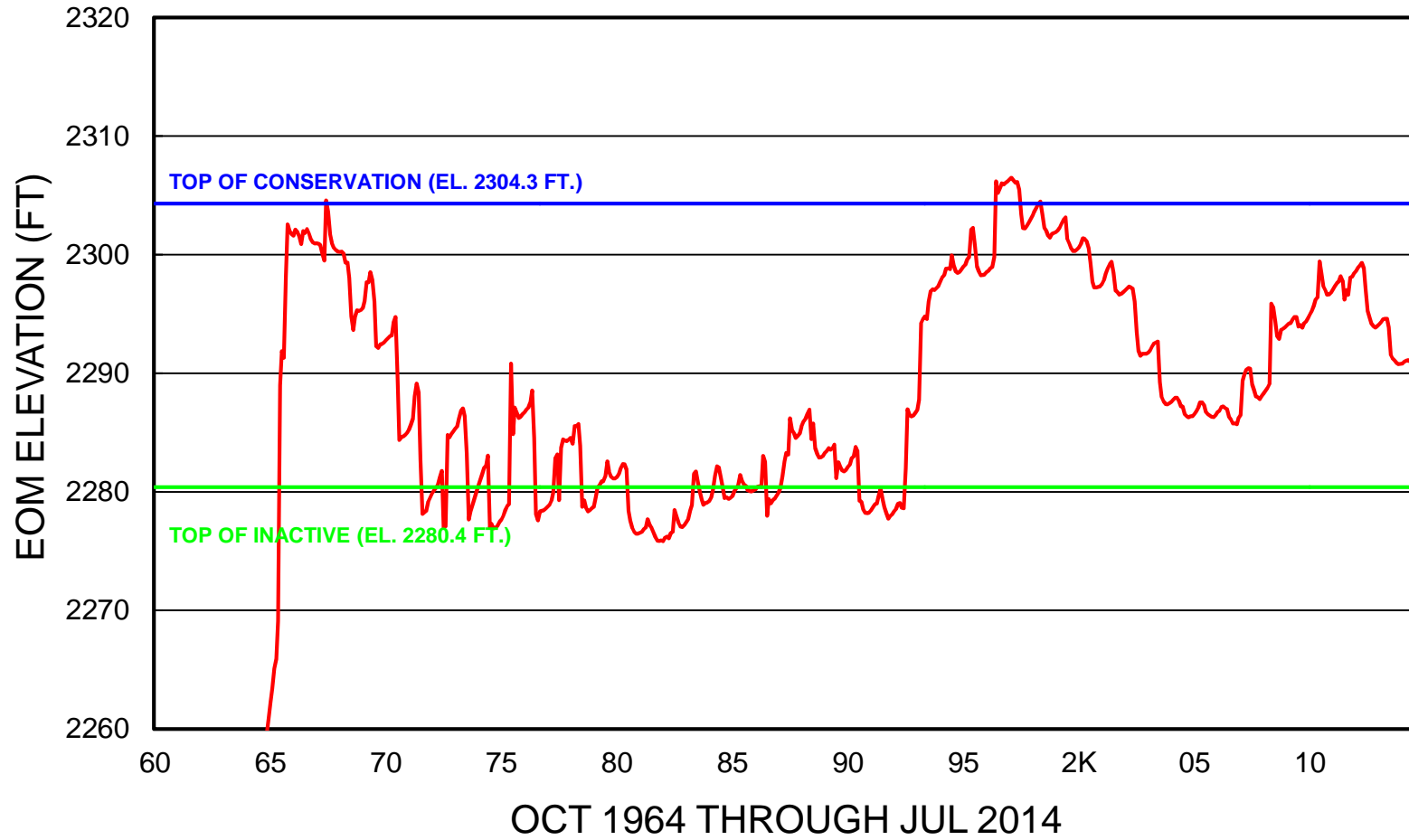
# HUGH BUTLER LAKE END OF MONTH ELEVATION



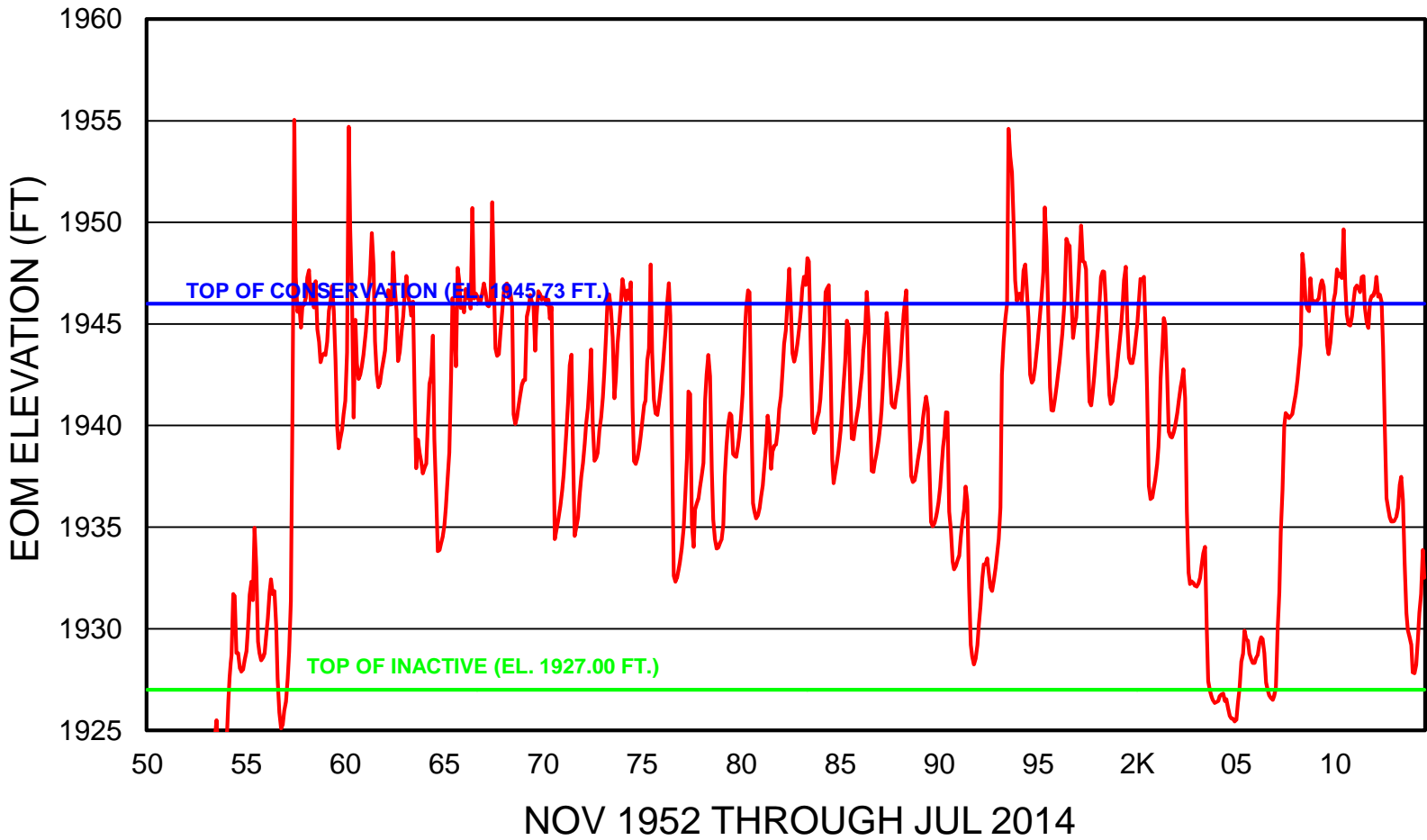
# HARRY STRUNK LAKE END OF MONTH ELEVATION

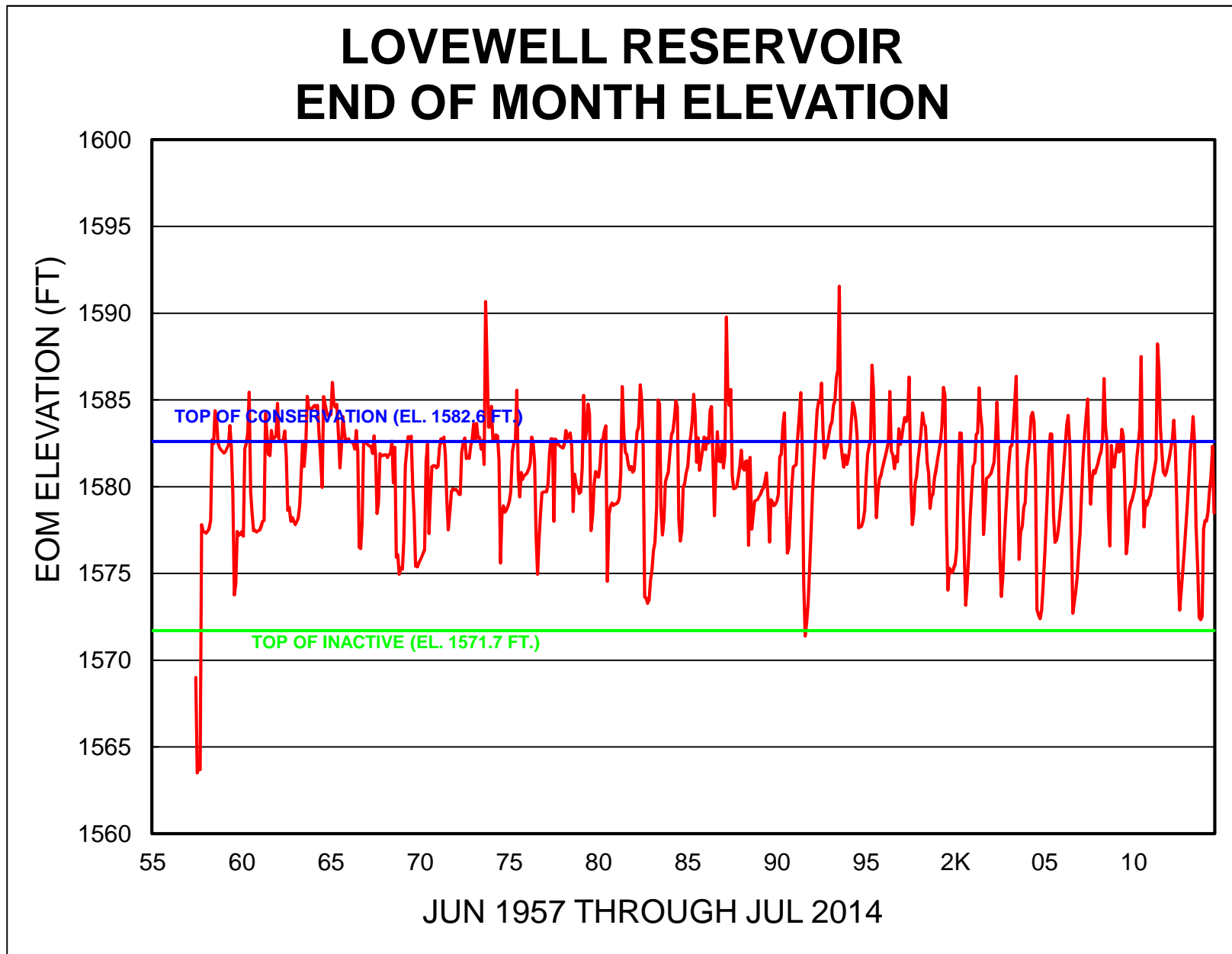


# KEITH SEBELIUS LAKE END OF MONTH ELEVATION



# HARLAN COUNTY LAKE END OF MONTH ELEVATION





# EXHIBIT E

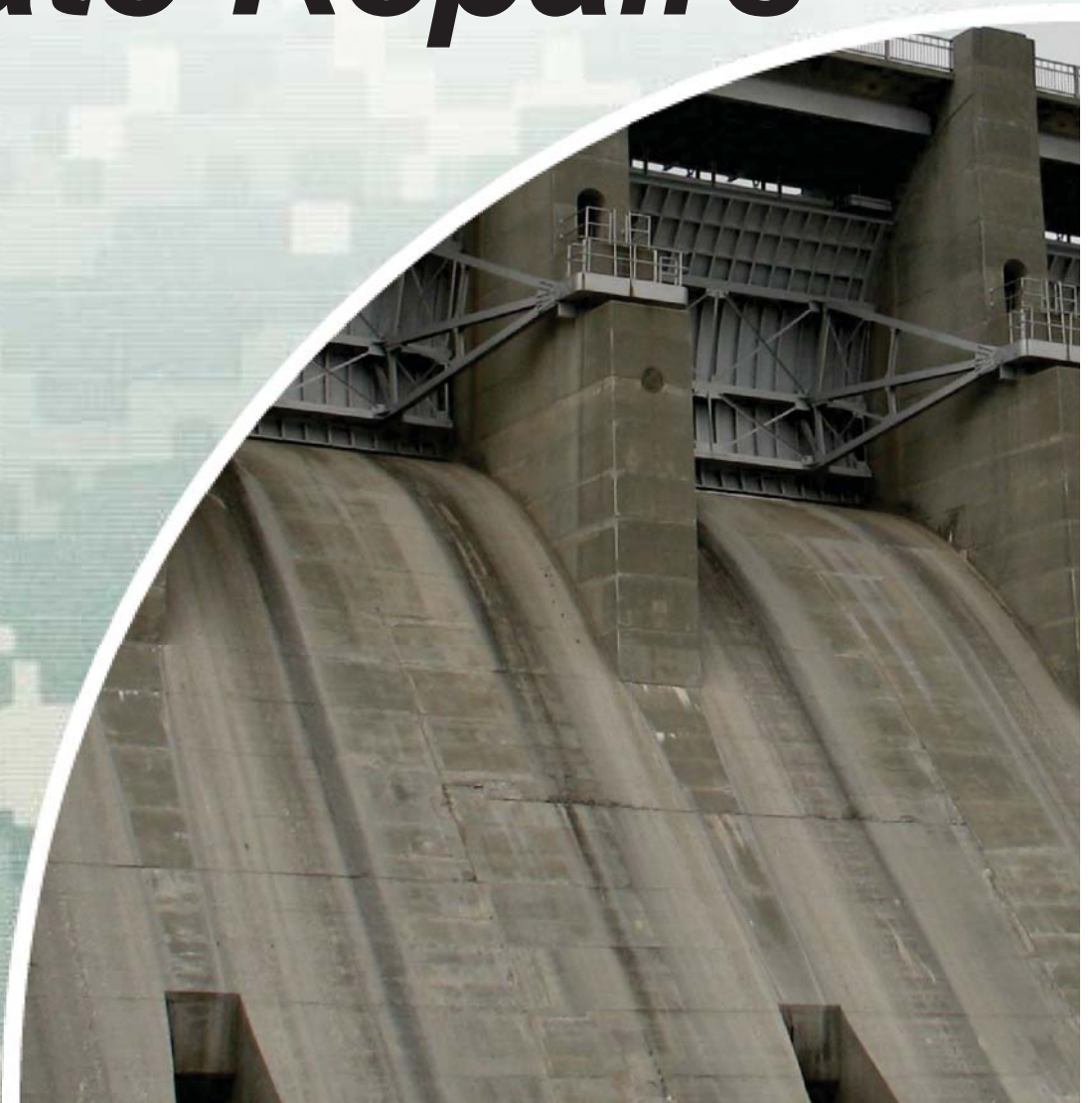
# *Harlan County Dam Tainter Gate Repairs*

*Ken Stark,  
Project Manager*

*August 28, 2014*



US Army Corps of Engineers  
**BUILDING STRONG®**



# *Presentation Outline*

- Harlan County Dam Overview
- Repairs
  - ▶ Tainter Gate Stoplogs
  - ▶ Tainter Gates
  - ▶ Irrigation Stoplogs
  - ▶ Sluice Gates
- Timeline



**BUILDING STRONG®**



# Harlan County Dam Overview

## 9 - Sluiceways

- Low/normal release
- Each Gate 5' x 8'

## 2 - Irrigation Conduits

## 18 - Tainter Gates

- Flood Control release
- Each 40' x 30'



**BUILDING STRONG®**

# Tainter Gate Stoplogs

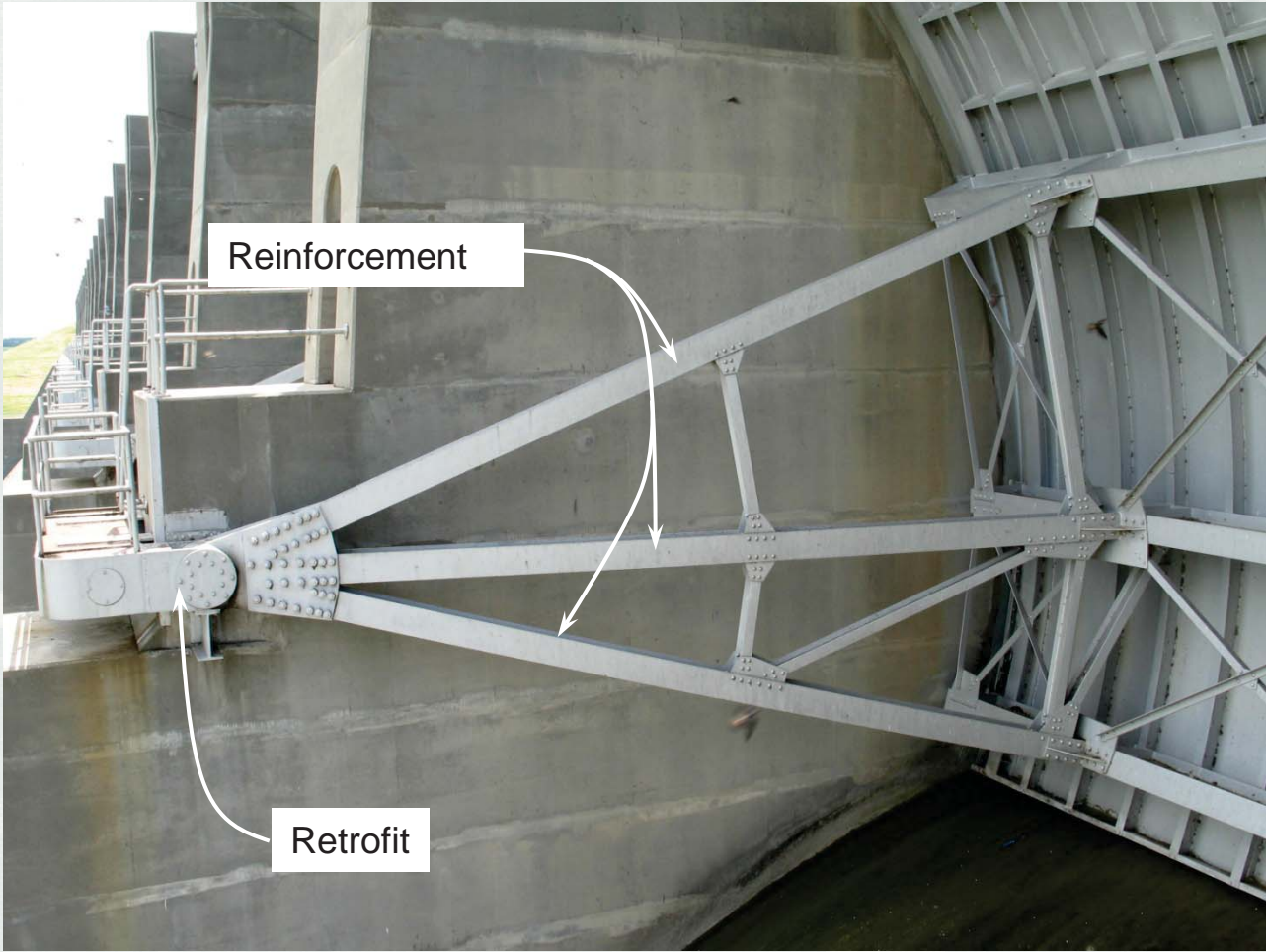


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# Tainter Gate Stoplogs



# Tainter Gate Repairs



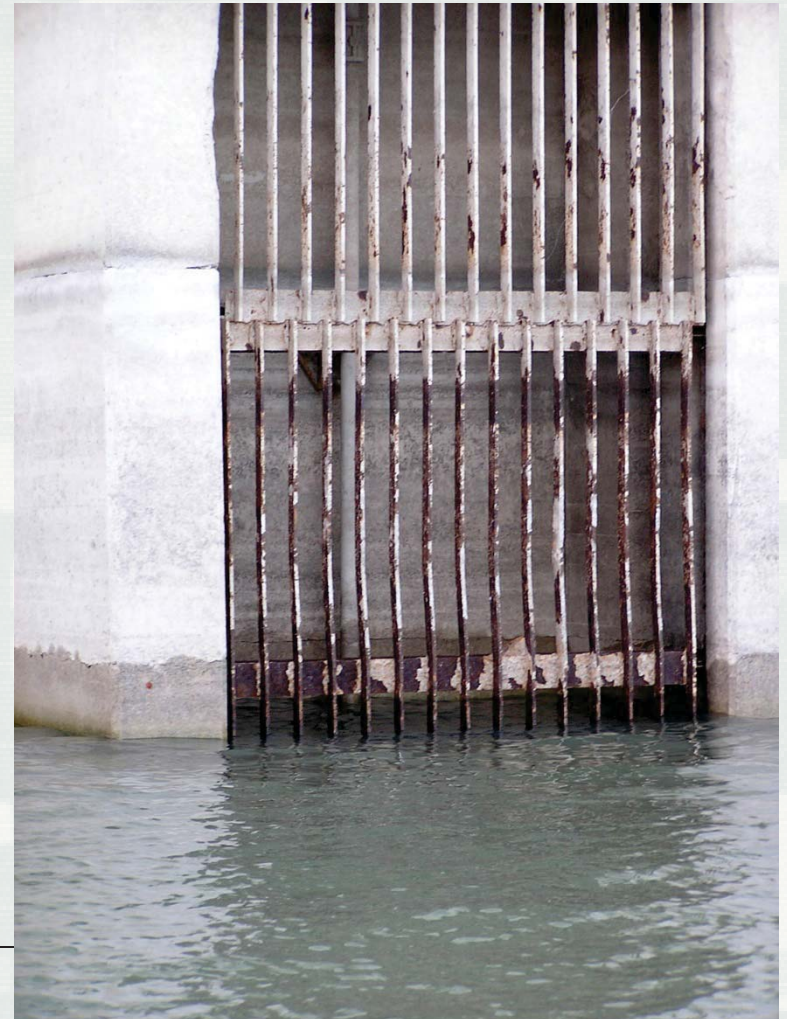
**BUILDING STRONG®**

# Irrigation Stoplogs

Franklin Irrigation Intake



Naponee Irrigation Intake



# Sluice Gate Repairs



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# *Harlan County Dam Repair Timeline*

## Fiscal Year

2013-15

## Scope

Tainter Gate Stoplogs

2015-18

Repair of 18 Tainter Gates  
Irrigation Stoplogs  
Sluice Gate Repair



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# EXHIBIT F



# **Republican River Compact Nebraska Stream-Gaging Data Water Year 2013**

Presented to  
Republican River Compact Administration  
By Jason Lambrecht, Associate Director for Hydrologic Data  
Nebraska Water Science Center

August 28, 2014  
Lincoln, Ne.



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

Republican River Basin streamflow-gaging stations with records published by USGS for water year (WY) 2013

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

Station number	Station name	Mean discharge (ft <sup>3</sup> /s) WY 2013	Long-term	WY 2013 as percentage of long-term mean	WY 2013 as rank/years (1 highest)	WYs used for long-term mean	Remarks
<b>USGS Compact stations supported by the National Streamflow Information Program (NSIP)</b>							
06821500	Arikaree River at Haigler, Nebr	0.03	16.5	0.18%	81/81	1933 - 2013	
06823000	North Fork Republican River at Colo- Nebr State Line	26.1	41.4	63%	73/78	1935 - 2013	
06823500	Buffalo Creek near Haigler, Nebr	1.53	6.03	25.4%	73/73	1941 - 2013	
06824000	Rock Creek at Parks, Nebr	20.9	12.0	174.2%	1/73	1941 - 2012	
06827500	South Fork Republican River near Benkelman, Nebr	0.00	3.51	0.0%	76/76	1938 - 2013	
06835500	Frenchman Creek at Culbertson, Nebr	28.4	66.1	43%	60/63	1951 - 2013	Since Enders Reservoir
06836500	Driftwood Creek near McCook, Nebr	1.74	8.28	21%	61/67	1946 - 2013	
06838000	Red Willow Creek near Red Willow, Nebr	8.93	13.7	65.2%	40/52	1962 - 2013	Since Hugh Butler Lake
06847500	Sappa Creek near Stamford, Nebr (USACE funds DCP)	1.82	38.4	4.74%	60/67	1946 - 2013	
06852500	Courtland Canal at Nebr-Kans State Line (USBR DCP)	85.3	75.5	113%	23/59	1955 - 2013	
<b>USGS stations supported by USGS and/or other Federal or State agencies</b>							
06828500	Republican River at Stratton, Nebr	23.1	93.6	24.7%	57/63	1951 - 2013	Funded by USACE and NSIP
06837000	Republican River at McCook, Nebr	29.4	124	23.7%	55/59	1955 - 2013	Funded by USBR, NDNR, and NSIP
06844500	Republican River near Orleans, Nebr	51.5	227	22.7%	62/66	1948 - 2013	Funded by USACE
<b>NDNR stations with USGS/USACE support for DCP, Web display, review, and publishing</b>							
06834000	Frenchman Creek at Palisade, Nebr	19.2	60.1	31.9%	60/63	1951 - 2013	
06843500	Republican River at Cambridge, Nebr	60.5	210	28.8%	61/64	1950 - 2013	Since Harry Strunk Lake

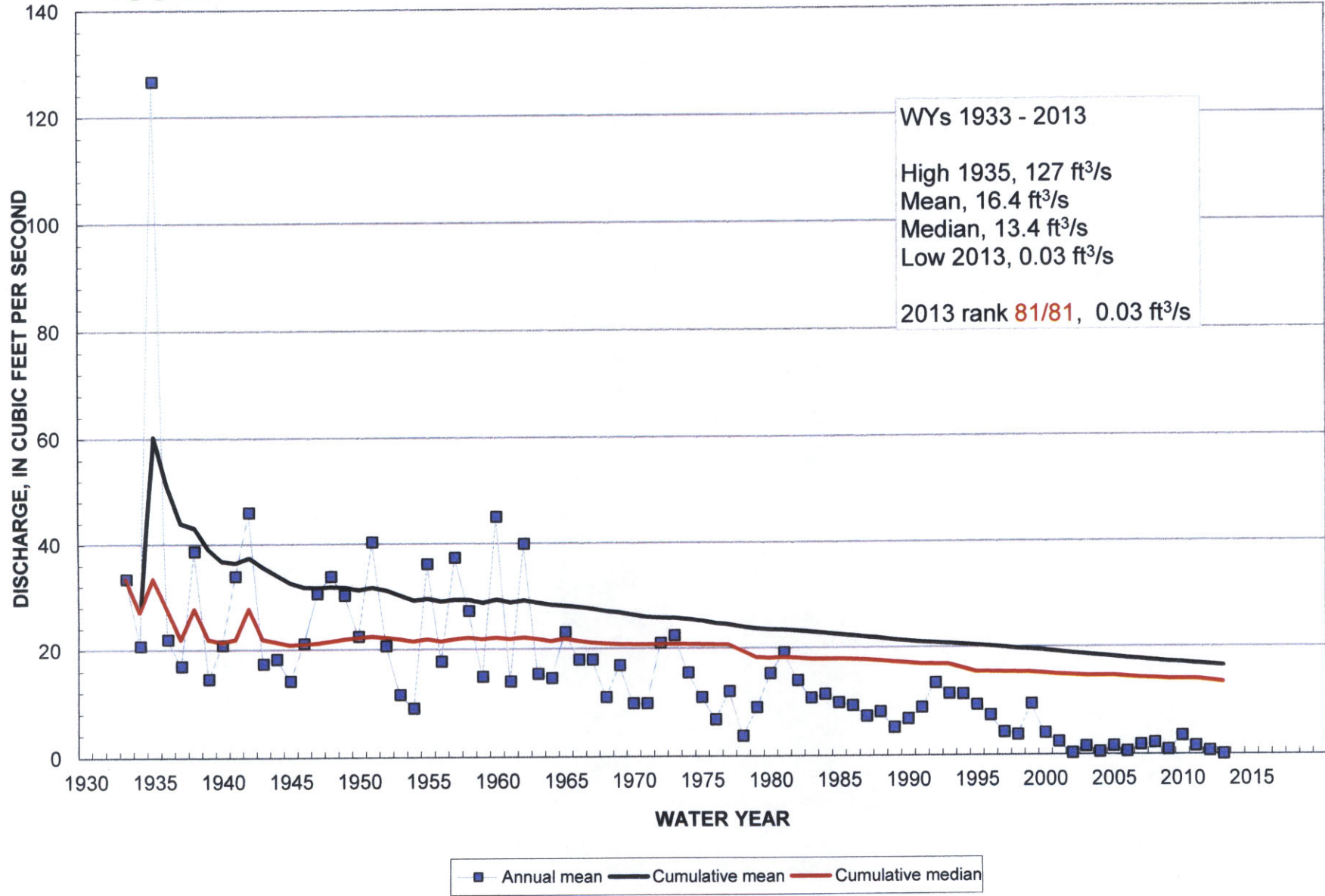
Online Annual Water Data Reports available at or through

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



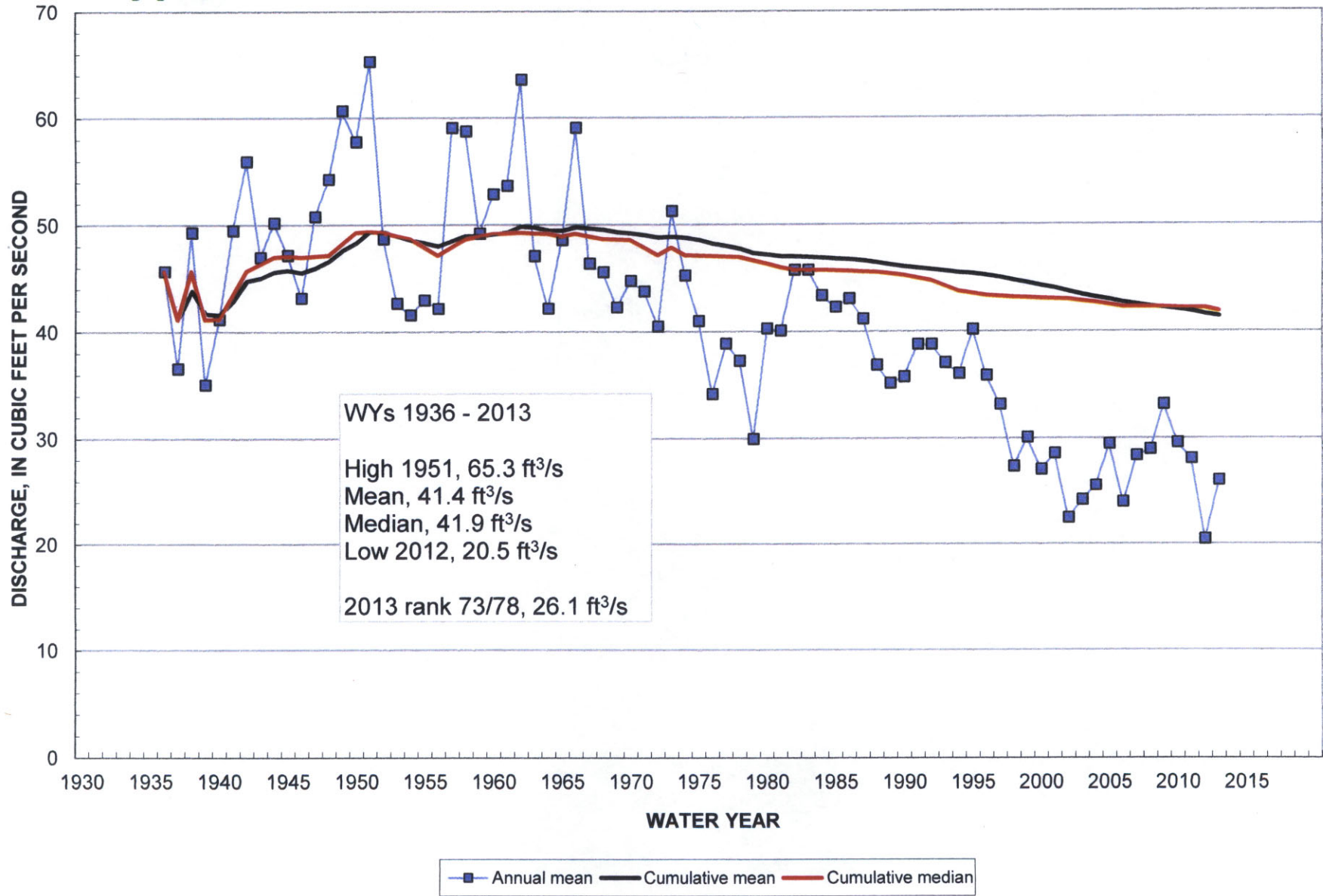


06821500 Arikaree River at Haigler, NE



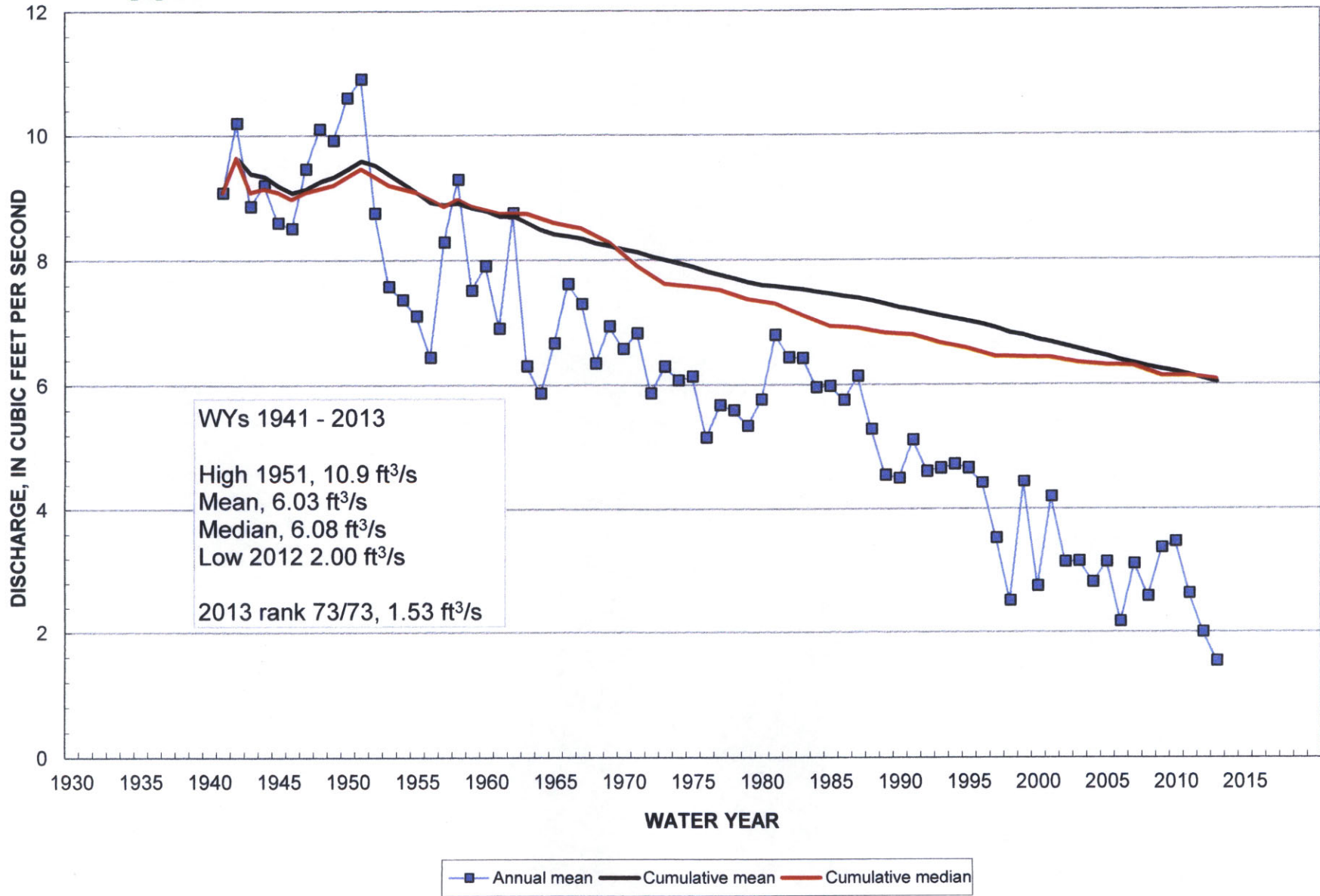


### 06823000 N Fk Republican River at CO-NE State Line



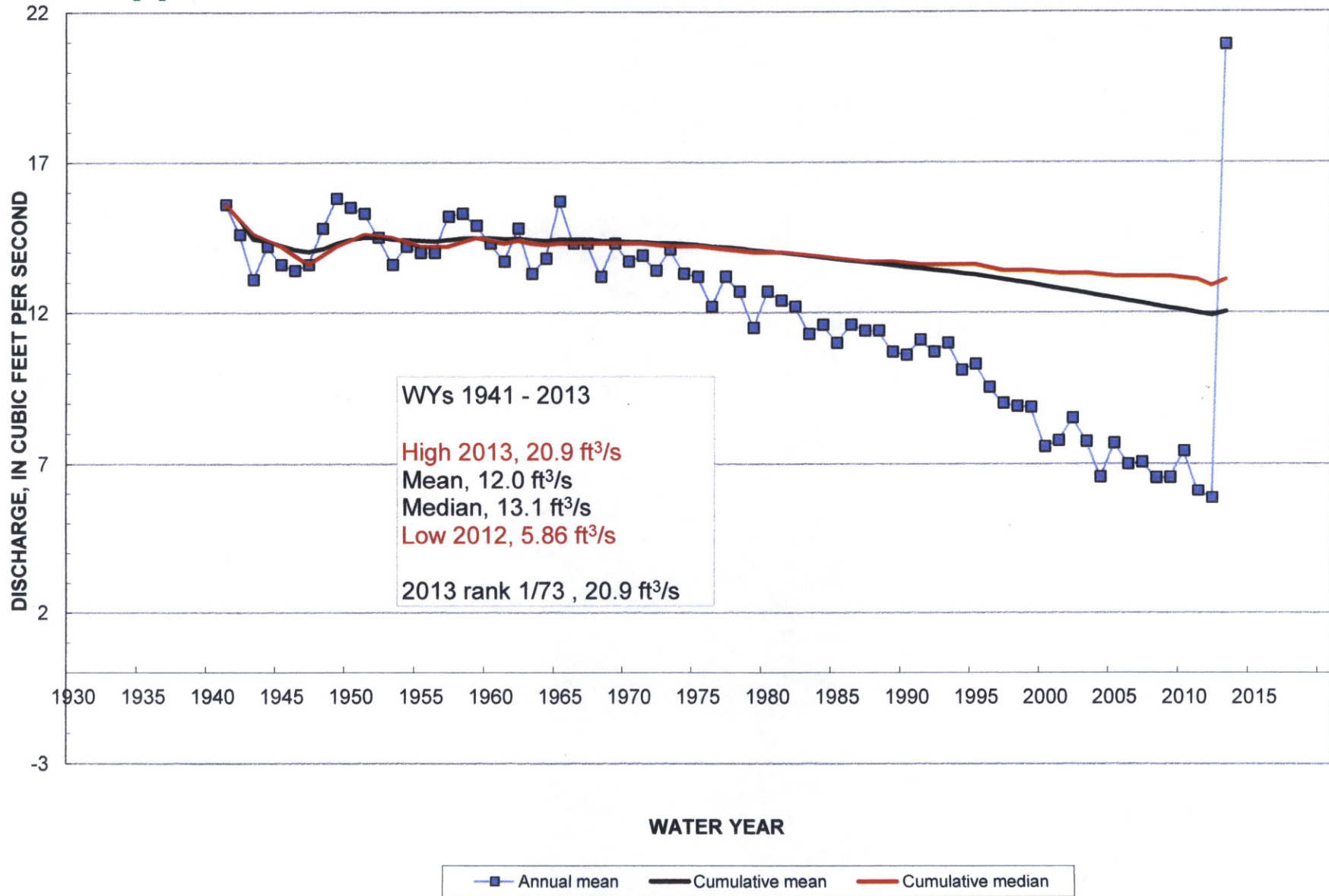


06823500 Buffalo Creek near Haigler, NE



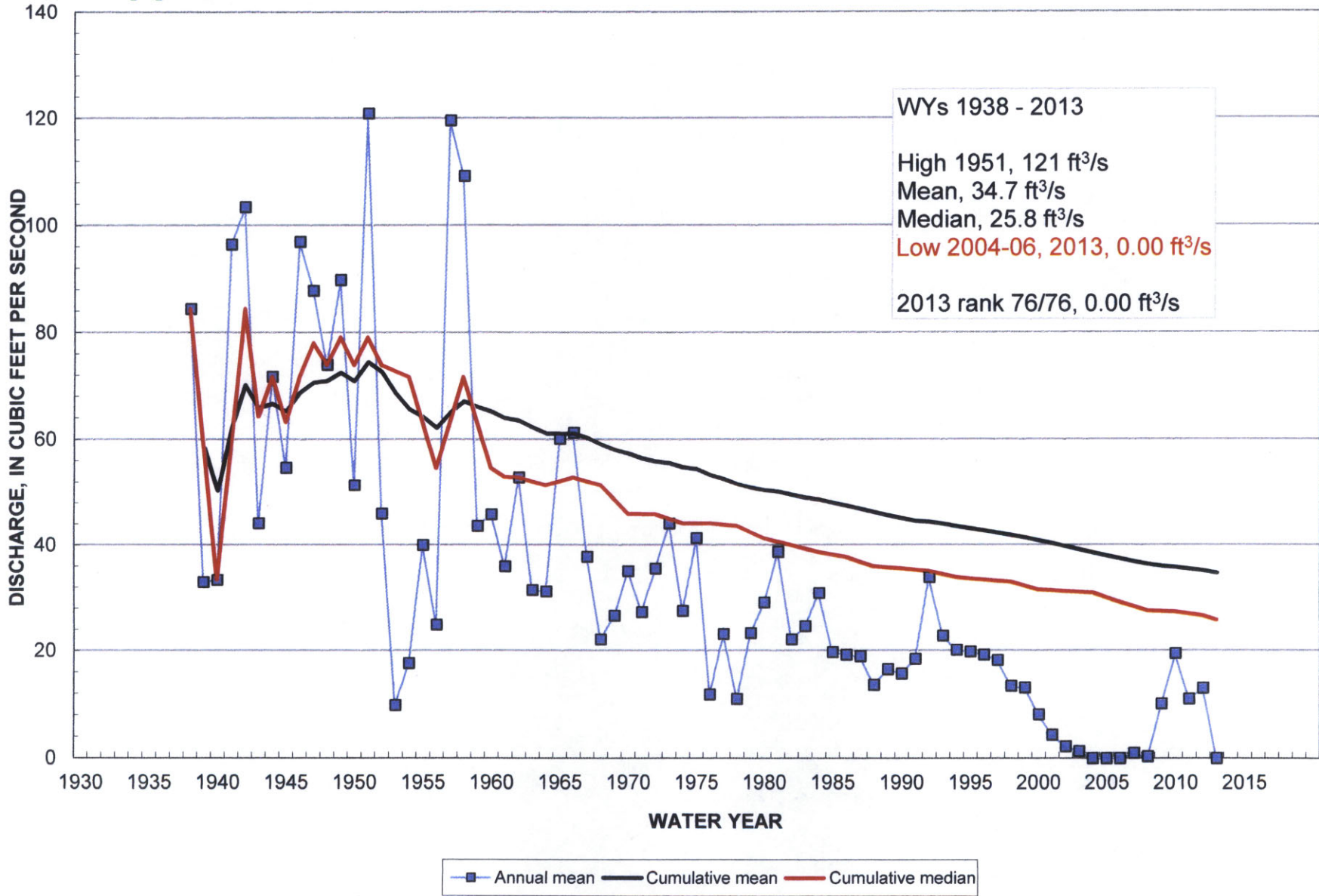


06824000 Rock Creek at Parks, NE



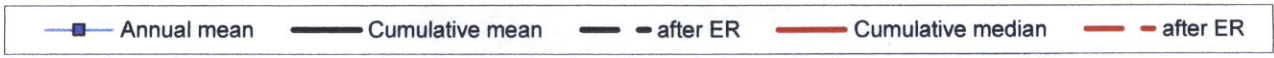
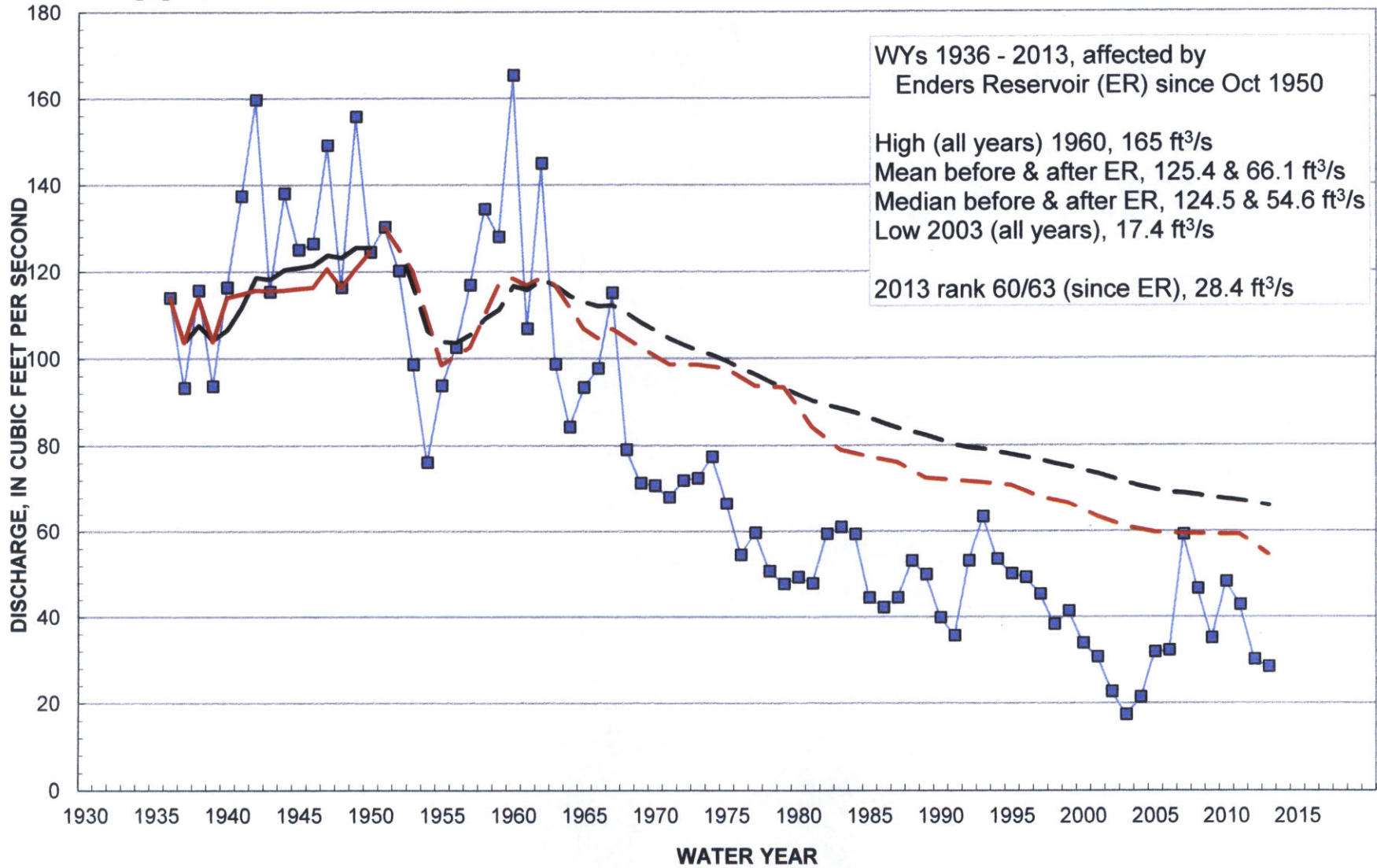


06827500 S Fk Republican River near Benkelman, NE





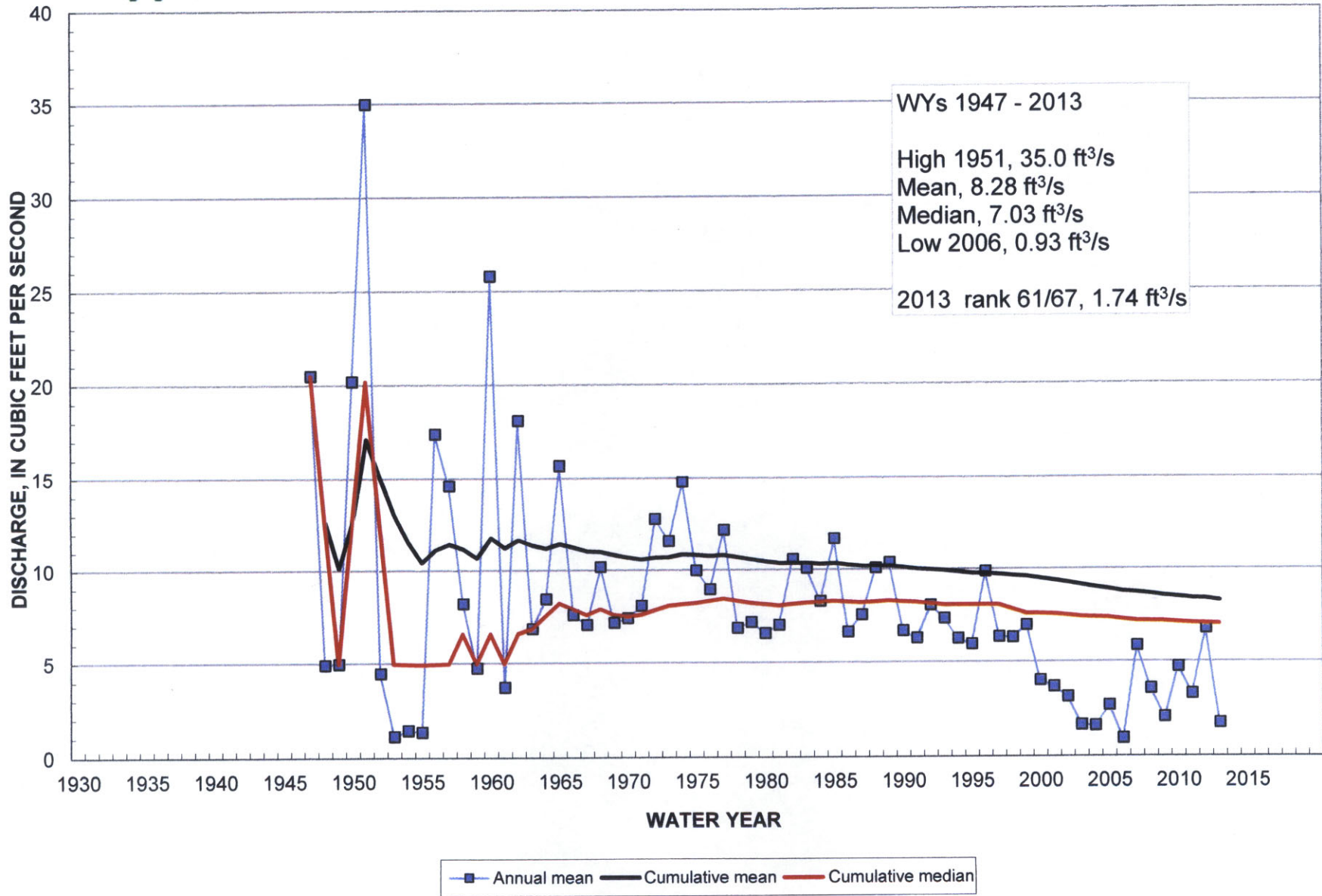
06835500 Frenchman Creek at Culbertson, NE





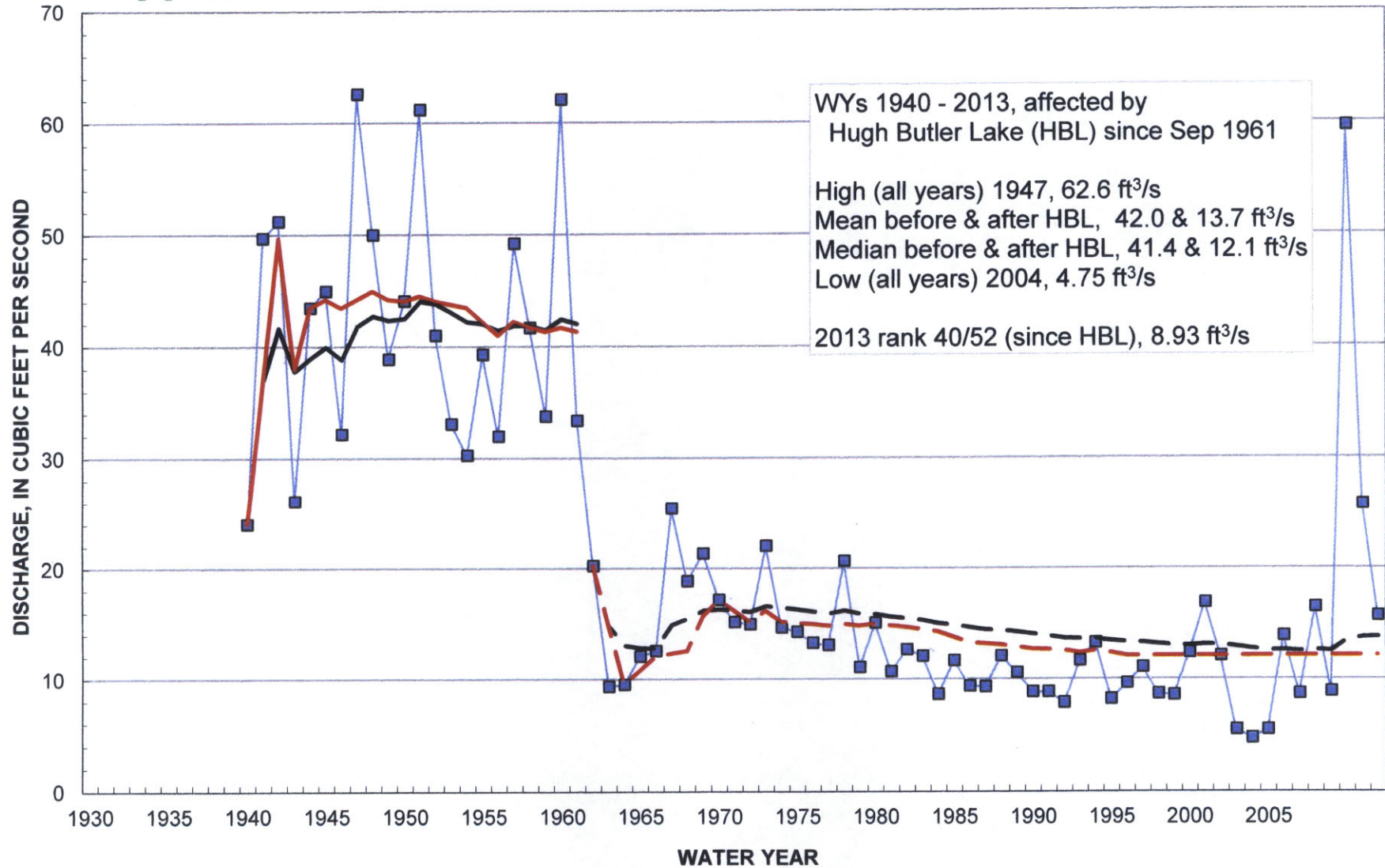


06836500 Driftwood Creek near McCook, NE





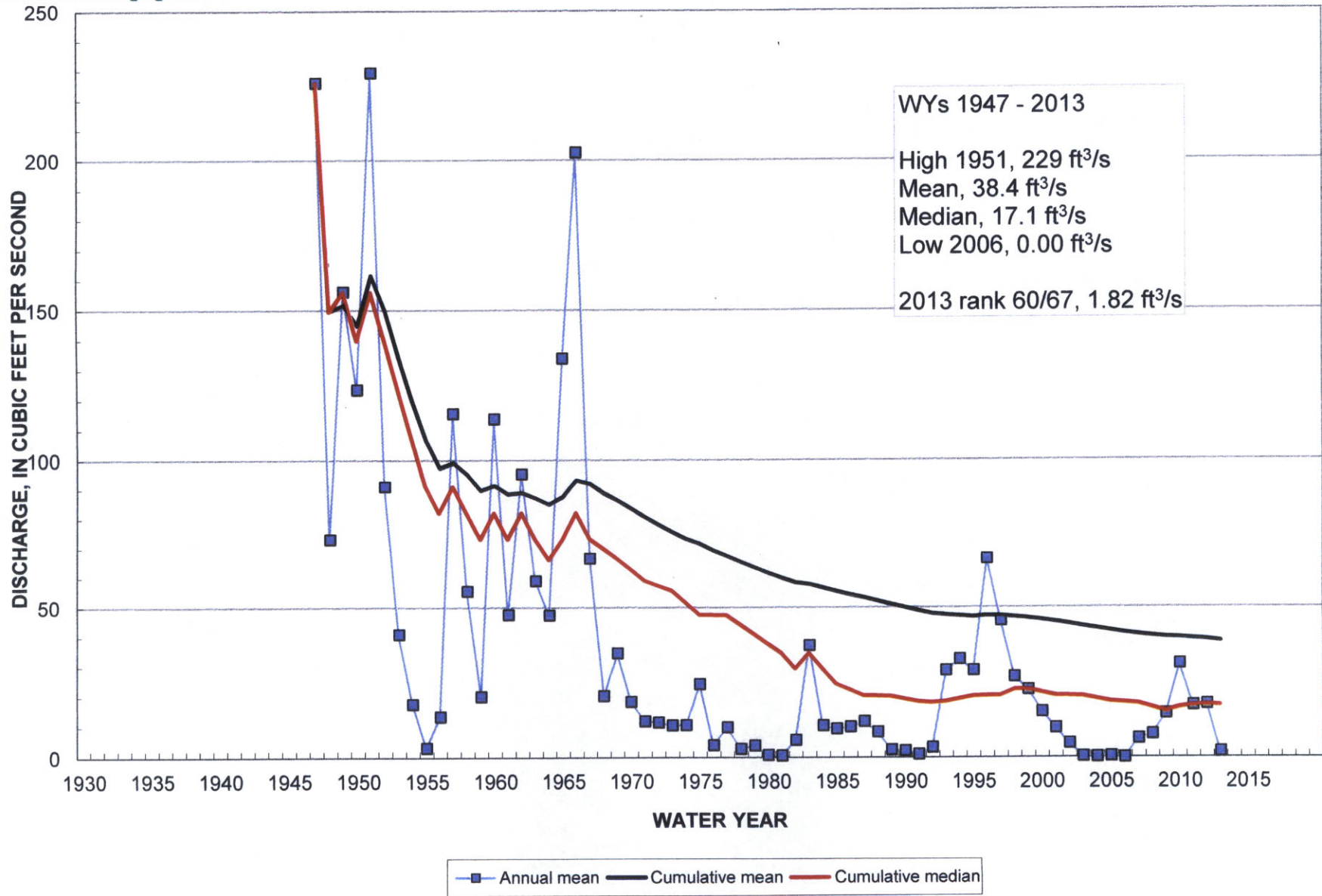
06838000 Red Willow Creek near Red Willow, NE



■ Annual mean   
 — Cumulative mean   
 - - after HBL   
 — Cumulative median   
 - - after HBL

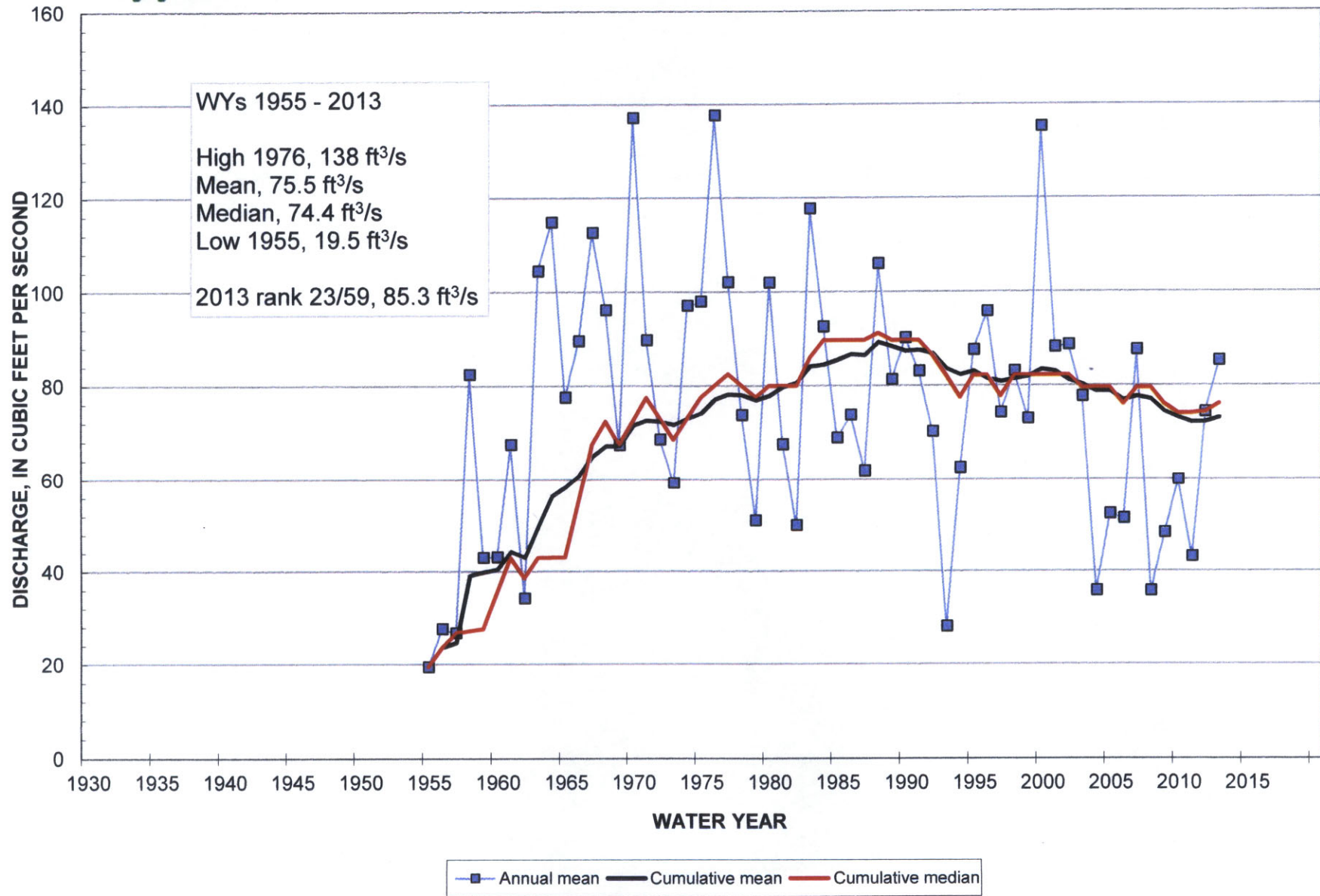


06847500 Sappa Creek near Stamford, NE



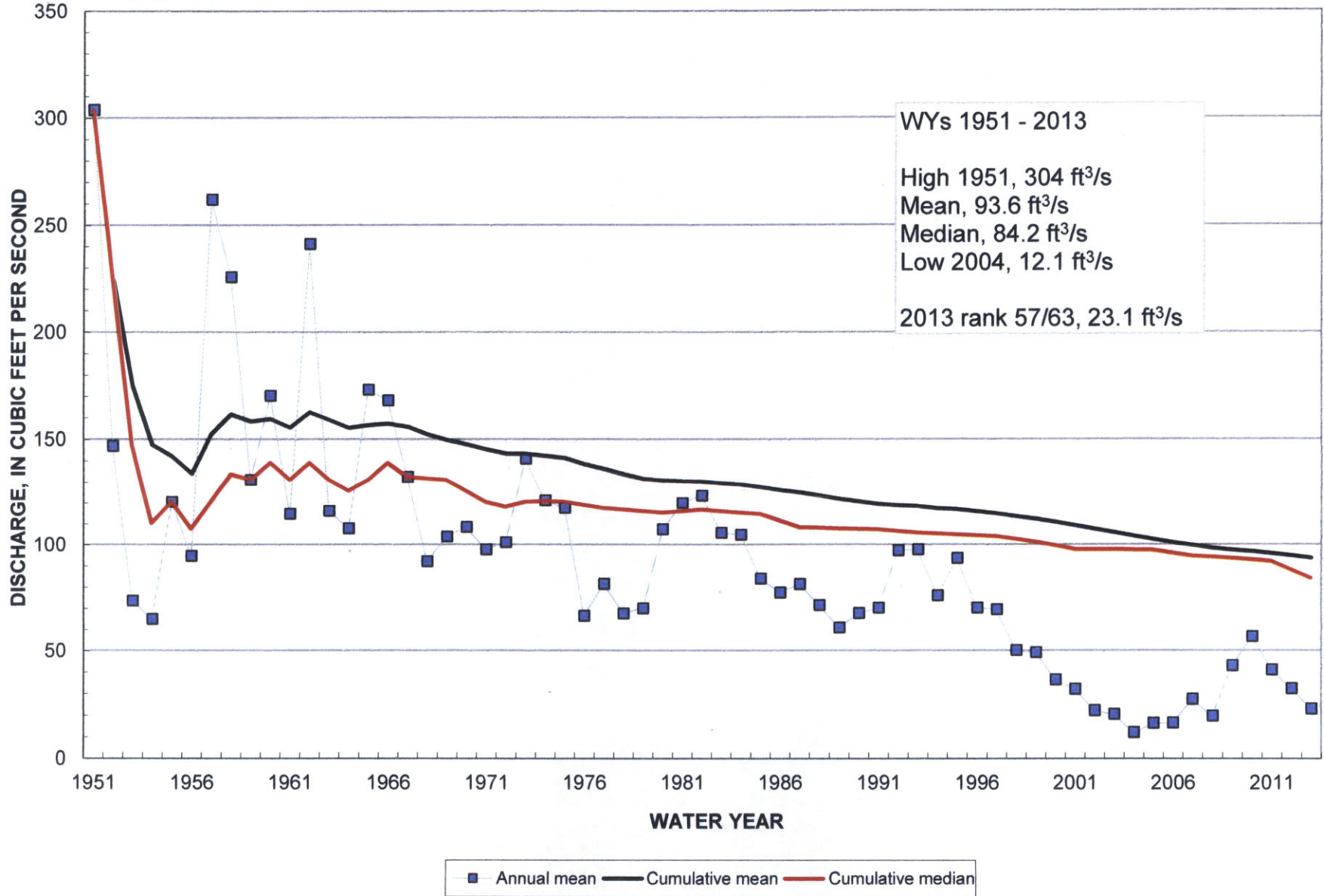


### 06852500 Courtland Canal at NE-KS State Line



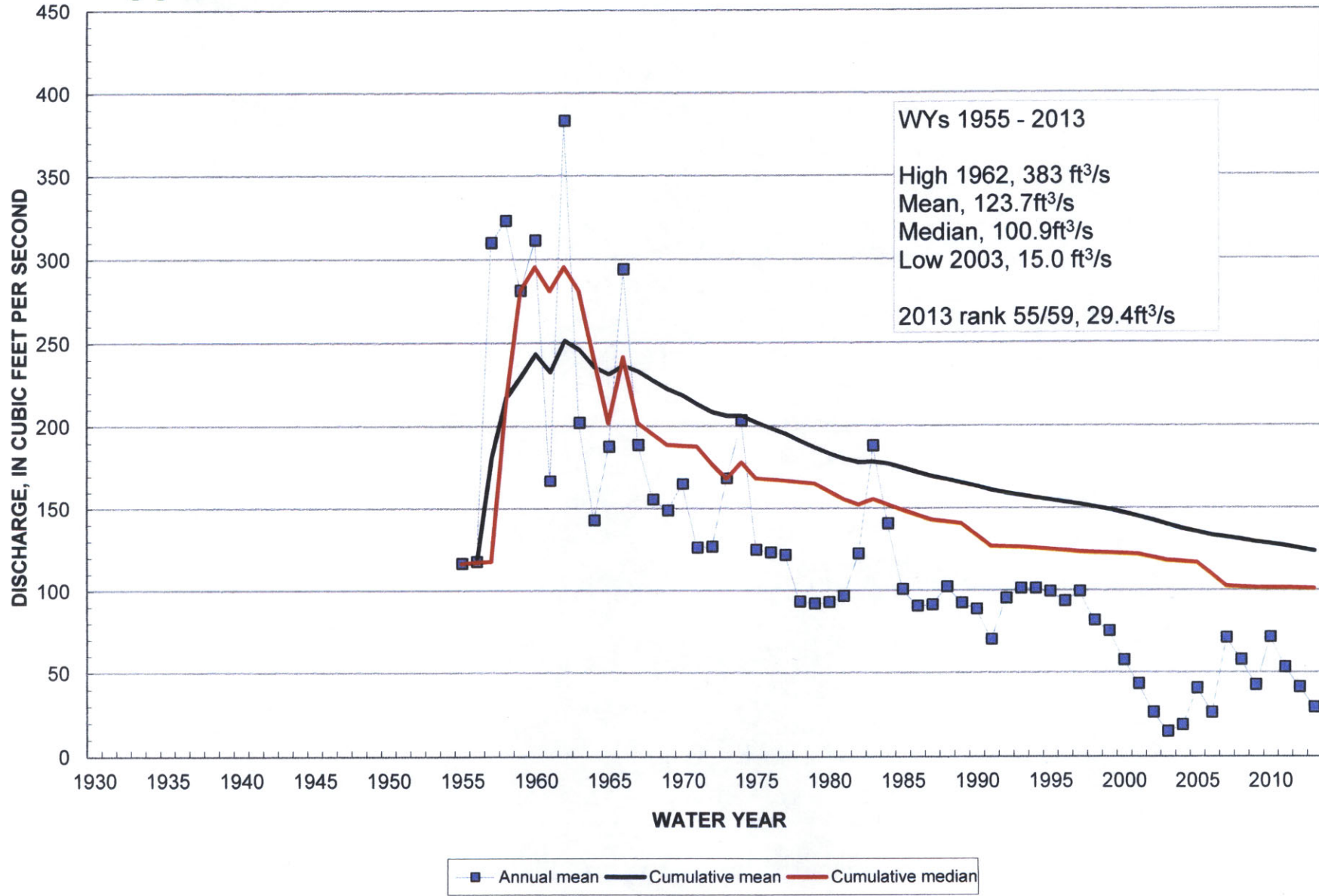


06828500 Republican River at Stratton, NE



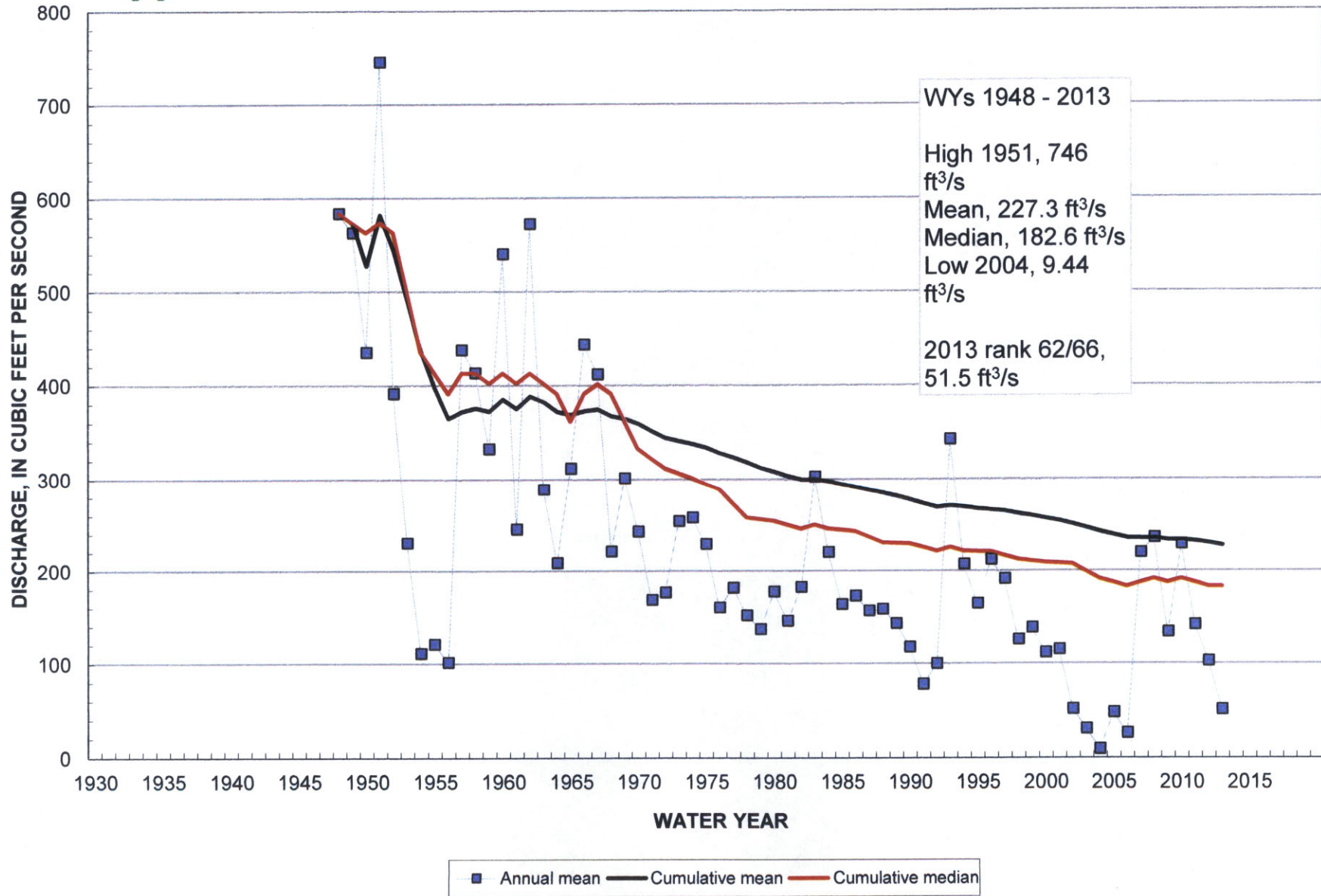


06837000 Republican River at McCook, NE



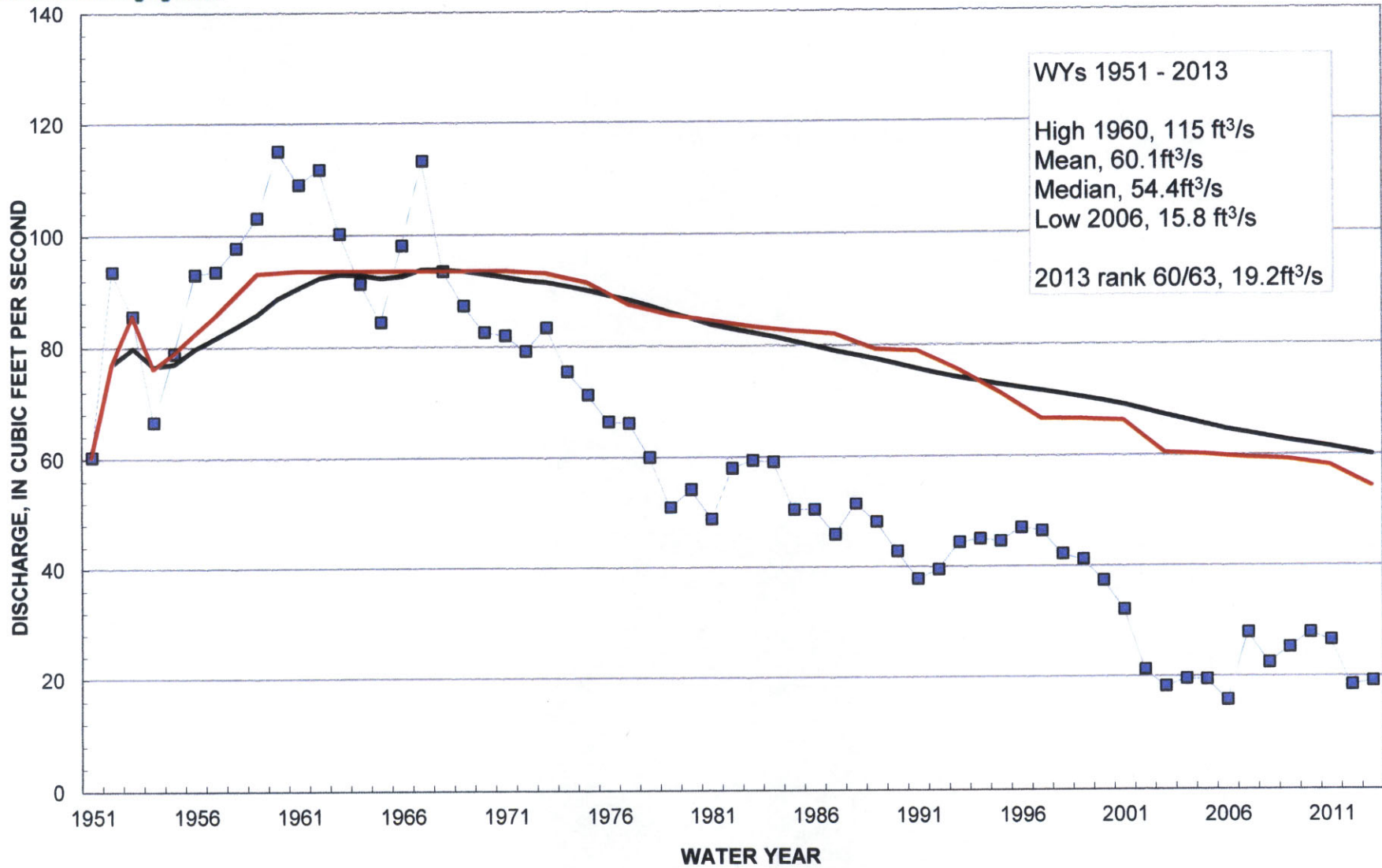


06844500 Republican River near Orleans, NE





06834000 Frenchman Creek at Palisade, NE

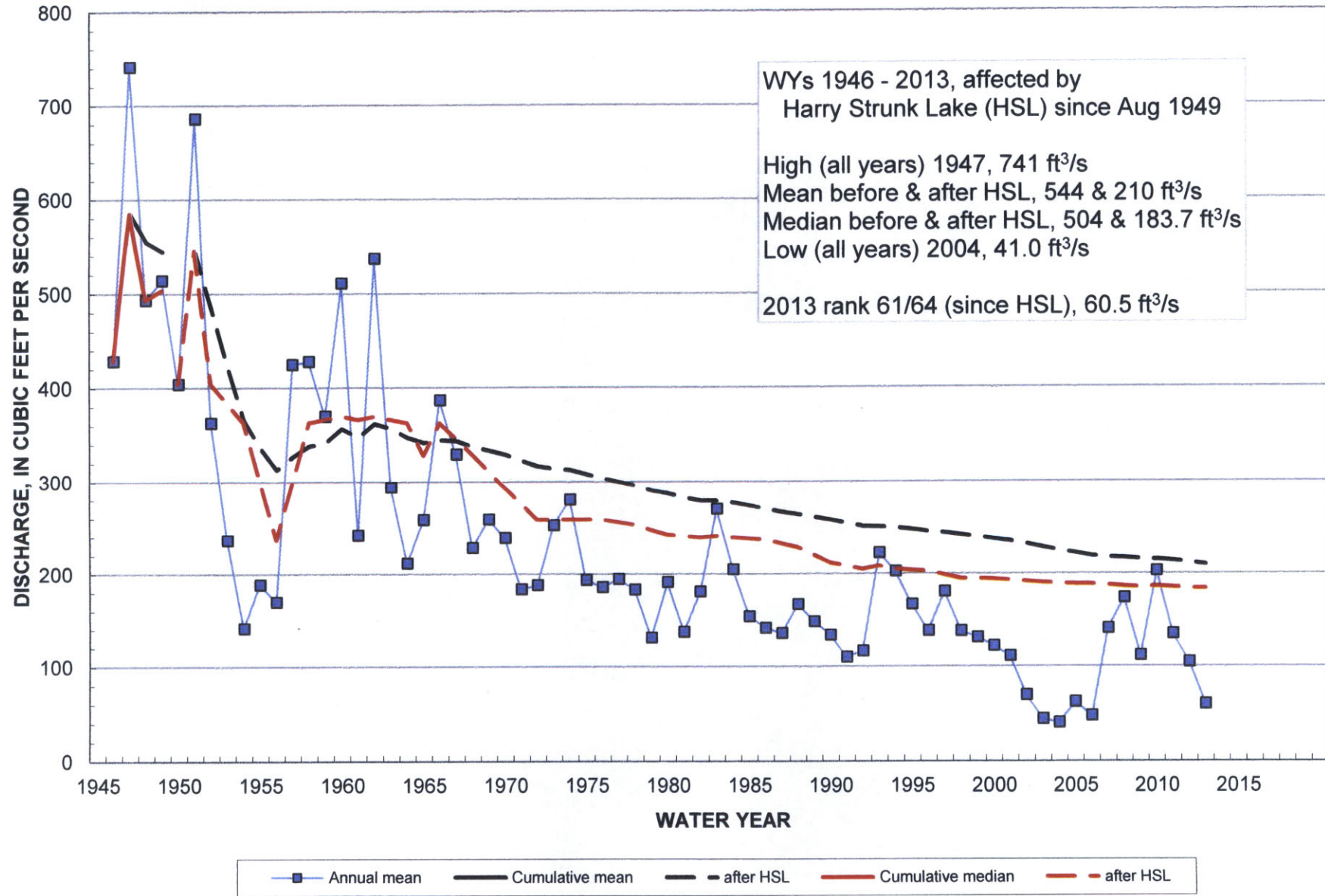


■ Annual mean    — Cumulative mean    — Cumulative median





06843500 Republican River at Cambridge, NE



# EXHIBIT G

## **Engineering Committee Report**

### **Republican River Compact Administration**

August 28, 2014

#### **EXECUTIVE SUMMARY**

The Engineering Committee (EC) met 5 times since last September's Republican River Compact Administration (RRCA) Annual Meeting. Over the past year, the EC completed these assignments: 1) holding quarterly meetings, 2) exchanging accounting data and documentation, 3) discussing specific modeling and data tasks to be assigned to Principia Mathematica, 4) discussing issues preventing agreement on final accounting for 2006-2012, 5) discussing the establishment of a budget to accomplish tasks for Compact goals, and 6) reviewing the task descriptions in each state's contract with Principia Mathematica.

Ongoing assignments include 1) continuing efforts to resolve concerns related to varying methods of estimating ground and surface water recharge and return flows and related issues, 2) continuing efforts to finalize accounting for 2006-2012, 3) discussing any accounting changes that may be needed for surface water diversion for the purpose of recharging groundwater, 4) discussing developing an application and approval process for future augmentation plans, 5) exploring options for sharing evaporation charges for Harlan County Lake when accounts exist separate from the project water supplies of Bostwick Irrigation District, 6) exploring potential means to adjust the compact accounting of Harlan County Lake for the mutual benefit of the States, and 7) exploring the development of an RFP to determine contractor options for the annual model update and model repository.

The EC recommends discussion by the RRCA on the exchange of data and documentation and the modeling runs completed by Principia Mathematica for 2013, the establishment of a budget, the Conservation Terrace Study, and the recommended EC assignments for the following year.

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

#### **COMMITTEE ASSIGNMENTS AND WORK ACTIVITIES RELATED TO THESE ASSIGNMENTS**

1. The Engineering Committee will meet quarterly to review the tasks assigned to the committee.
  - a. Assignment Completed. The Engineering Committee held five meetings since the September RRCA Annual Meeting. Notes from the five EC meetings are attached: October 28 (Attachment 1), November 22 (Attachment 2), January 22 (Attachment 3), April 28 (Attachment 4), and August 14 (Attachment 5).
2. Exchange by April 15, 2014, the information listed in Section V of the RRCA Accounting Procedures and Reporting Requirements, and other data required by that

*RRCA Engineering Committee Report for 2014*

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document, including all necessary documentation. By July 15, 2014, the states will exchange any updates to these data.

- a. Assignment Completed.
  - b. Kansas, Nebraska, and Colorado posted preliminary data by April 15. The status and details of the preliminary data exchange was discussed at the April 28, 2014, EC meeting (Attachment 4). Nebraska posted final data on June 6, 2014, Kansas posted final data on August 19, 2014, and Colorado will post final data shortly after supporting USDA statistics are released.
  - c. The Committee collected stream flow data, climate information, diversion records, and reservoir evaporation records from the three states in cooperation with the U.S. Geological Survey, U.S. Bureau of Reclamation, and U.S. Army Corps of Engineers for 2013.
  - d. Willem Schreüder of Principia Mathematica executed three modeling runs in advance of the April meeting. These three runs were for the purposes of evaluating the difference between the five-run procedure and the original procedure, as well as the difference between modeling Bonny Reservoir as dry or full. Details were discussed at the April 28, 2014, Committee meeting (Attachment 4). It was decided at the August 14, 2014, Committee meeting to continue doing all three runs until these issues are sorted out (Attachment 5).
  - e. Principia Mathematica completed a preliminary model run on June 6, 2014. The most recent results are included as Attachment 6. A final run will be completed when the USDA statistics are received.
  - f. The Committee discussed the process of updating documentation of the modeling processes and agreed that the documentation should focus on keeping the overall logic in plain view, as opposed to detailing small nuances that would need to be adapted year to year (Attachment 4). Principia Mathematica will continue to update the modeling process documentation to reflect both historical and current processes (Attachment 5).
3. The Engineering Committee recommends an assignment of continued discussion of specific modeling and data tasks to be assigned to Principia Mathematica, to be accomplished by December 15, 2013.
    - a. Assignment Completed. This task was discussed at the RRCA Special Meeting on December 19, 2013.
  4. Continue efforts to resolve concerns related to varying methods of estimating ground and surface water irrigation recharge and return flows within the Republican River Basin and related issues.
    - a. Assignment Ongoing.
    - b. Kansas is working on a scope and needs document for this task regarding changes in irrigation efficiency through time.
  5. Continue efforts to finalize accounting for 2006-2012.
    - a. Assignment Ongoing

*RRCA Engineering Committee Report for 2014*

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- b. Arbitration on the issues preventing the states from agreeing on the accounting has concluded. These issues remain unresolved.
  6. Continue discussion of issues preventing agreement on final accounting for 2006-2012.
    - a. Assignment Completed.
    - b. Arbitration on the issues preventing the states from agreeing on the accounting has concluded. These issues remain unresolved.
    - c. The Committee discussed options for reaching consensus about how to model Bonny Reservoir, which is one issue that was included in arbitration.
    - d. The Committee discussed new accounting issues beyond those included in the arbitration. New issues include 1) Evaluation of whether to include direct return data from canals in accounting calculations and modeling (Column C of Attachment 7 to the RRCA Accounting Procedures) and 2) Kansas's request for beginning and ending meter data from the other states.
  7. Discuss any accounting changes that may be needed for surface water diversions for the purpose of recharging groundwater, as data becomes available from Nebraska projects.
    - a. Assignment Ongoing.
    - b. Nebraska anticipates studies will be conducted during a wet year. The Committee recommends this task remain on the Engineering Committee list for future investigation as data become available.
    - c. The Committee identified the need for further discussion about how accounting procedures address evaporation and diversion at different times of the year.
  8. Discuss developing an application and approval process for future augmentation plans.
    - a. Assignment Ongoing.
    - b. Arbitration on the augmentation plan process has concluded. This issue remains unresolved.
  9. The Engineering Committee will explore options for sharing evaporation charges for Harlan County Lake when accounts exist separate from the project water supplies of Bostwick Irrigation District and explore potential means to adjust the compact accounting of Harlan County Lake for the mutual benefit of the States.
    - a. Assignment Ongoing.
    - b. Kansas submitted a proposal for calculating and assessing evaporation charges for certain special water impounded in Harlan County Lake. The Kansas proposal is available as Attachment A to the Engineering Committee January Meeting Notes (Attachment 3).
    - c. Kansas is putting together examples of how the proposed method would work, including both hypothetical examples and examples based on 2013 data.
  10. The committee will engage in discussions to establish a budget to accomplish tasks needed by the Administration and States for Compact goals.
    - a. Assignment Completed and returned to the RRCA for Discussion.

*RRCA Engineering Committee Report for 2014*

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- b. The Engineering Committee has examined budget options using examples from other interstate compacts and asserts that a budget can be done if the RRCA chooses to do so. The Committee recommends that if the RRCA wishes to move forward on this issue, a budget committee be formed to accomplish this task.
11. Review the task descriptions in each state's contract with Principia Mathematica to ensure that there is no latitude for Principia Mathematica to deviate from the standard procedures without prior approval by all three states.
  - a. Assignment Completed.
  - b. New contracts executed by Colorado and Kansas in early 2014. Nebraska contract was determined to be adequate as written and was not revised.
12. Explore the development of an RFP to determine contractor options for the annual model update and model repository.
  - a. Assignment Ongoing.
  - b. The Committee discussed the possibility of an RFP, but did not get anything developed this year.

**OTHER COMMITTEE ACTIVITIES**

1. The Engineering Committee reviewed Nebraska's plans to relocate the Beaver Creek Stream Gage because the gage had fallen into disrepair (Attachment 4).
2. A Conservation Committee Terraces Study Report was delivered to the RRCA representatives via a letter sent July 11, 2014, and discussed by the Engineering Committee at the August meeting (Attachment 5). Status updates were given on the report's progress throughout the year. This report is now final and has been provided to the RRCA for their consideration.
3. The USGS National Streamflow Information Program (NSIP) requested recommendations for which stream gages it would be appropriate for them to assume responsibility, as they have received an increased allocation of funds. Nebraska identified four gages that would be suitable: Beaver Creek, Medicine Creek below Harry Strunk, and Republican River at Guide Rock, and Republican River at Benkelman. USGS will manage three of these. Discussions are ongoing to determine for which three gages USGS will assume responsibility.
4. The EC discussed the required 2014 update for the Colorado one year augmentation plan.

**ITEMS FOR RRCA DISCUSSION & ACTION**

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

*RRCA Engineering Committee Report for 2014*

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1. Agreement that the Data Exchange & Modeling Results for 2013 are complete. The EC has examined the data exchanged and the results from Principia Mathematical and agrees that the 2013 modeling runs are complete.
2. Discussion and direction on the specific modeling and data tasks to be assigned to Principia Mathematica for 2014.
3. Discussion regarding the establishment of a budget to accomplish tasks needed by the Administration and States for Compact goals. The EC has examined budget options using examples from other interstate compacts and asserts that a budget can be done if the RRCA chooses to do so. The Committee recommends that, should the RRCA choose to move forward on this issue, the RRCA form a budget committee for this purpose.
4. Acknowledgement of completion of the Conservation Committee Terraces Study report and discussion of potential action based on the findings therein.
5. Discussion of the recommended EC assignments and other potential assignments for the next year and agreement on a final set of assignments. The EC presents the list of 9 items in this report as recommended assignments for 2014.

**RECOMMENDED ASSIGNMENTS FOR THE COMING YEAR**

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

1. The Engineering Committee will meet quarterly to review the tasks assigned to the Committee.
2. Exchange by April 15, 2015, the information listed in Section V of the RRCA Accounting Procedures and Reporting Requirements, and other data required by that document, including all necessary documentation. By July 15, 2015, the states will exchange any updates to these data.
3. When possible, continue efforts to resolve concerns related to varying methods of estimating ground and surface water irrigation recharge and return flows within the Republican River Basin and related issues.
4. When possible, continue efforts to finalize accounting for 2006-2013.
5. Work to resolve issues preventing agreement on final accounting for 2006-2013, as identified in the 2014 Engineering Committee Report. These issues include:
  - a. Evaluation of whether to include direct return data from canals in accounting calculations and modeling (Column C of Attachment 7 to the RRCA Accounting Procedures),
  - b. Kansas's request for beginning and ending meter data from the other states, and
  - c. Reaching consensus about how to model Bonny Reservoir.
6. Discuss any accounting changes that may be needed for surface water diversions for the purpose of recharging groundwater, as data become available from Nebraska projects.

*RRCA Engineering Committee Report for 2014*

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7. When possible, discuss developing an application and approval process for future augmentation plans.
8. Continue to explore options for sharing evaporation charges for Harlan County Lake when accounts exist separate from the project water supplies of Bostwick Irrigation District and explore potential means to adjust the compact accounting of Harlan County Lake for the mutual benefit of the States.
9. Continue to explore the development of an RFP to determine contractor options for the annual model update and model repository.

The Engineering Committee Report and the exchanged data will be posted on the web at [www.republicanrivercompact.org](http://www.republicanrivercompact.org).

**SIGNED BY**

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James Schneider  
Chair, Engineering Committee Member for Nebraska

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Ivan Franco  
Engineering Committee Member for Colorado

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Chris Beightel  
Engineering Committee Member for Kansas



*RRCA Engineering Committee Report for 2014*

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7. When possible, discuss developing an application and approval process for future augmentation plans.
8. Continue to explore options for sharing evaporation charges for Harlan County Lake when accounts exist separate from the project water supplies of Bostwick Irrigation District and explore potential means to adjust the compact accounting of Harlan County Lake for the mutual benefit of the States.
9. Continue to explore the development of an RFP to determine contractor options for the annual model update and model repository.

The Engineering Committee Report and the exchanged data will be posted on the web at [www.republicanrivercompact.org](http://www.republicanrivercompact.org).

**SIGNED BY**



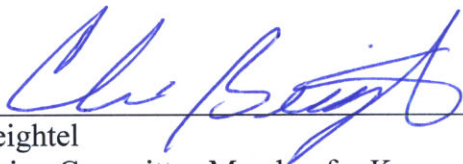
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James Schneider  
Chair, Engineering Committee Member for Nebraska



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Ivan Franco  
Engineering Committee Member for Colorado



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Chris Beightel  
Engineering Committee Member for Kansas

## Notes from the October Meeting of the RRCA Engineering Committee

Drafted 10/30/2013

Kansas edits 11/08/2013

Nebraska edits 11/15/2013

## Attendees:

Chris Beightel	Kansas	Ivan Franco	Colorado
Chelsea Erickson	Kansas	Jim Schneider	Nebraska
Sam Perkins	Kansas	Jennifer Schellpeper	Nebraska
Craig Scott	Reclamation	David Kracman	Nebraska
Scott Guenther	Reclamation	Tom Riley	Nebraska
		Willem Schreuder	Principia Mathematica

- 1 Introductions
- 2 Review / Modify Agenda
  - Schneider proposed adding an item: Beaver Creek Stream Gage
- 3 Publication of RRCA Annual Reports
  - **Kansas is taking the lead, will distribute to President of US and federal agencies, and each Party**
  - **Each Party will distribute to their Governor and Basin Stakeholders**
  - **The format will be electronic**
- 4 Modeling and Data Tasks for Principia Mathematica
  - Schneider emphasized that a centralized repository and the experience with the project are two factors of high importance to Nebraska
  - Franco noted that Colorado agrees with Nebraska
  - Beightel summarized Kansas' proposal (attachment A), noting that there is a potential for conflict of interest with the current procedures because Colorado's expert witness in litigation between Kansas, Colorado, and Nebraska is being paid to perform model updates and to generate model runs for the RRCA
  - Beightel noted that
    - The ability of each state to run the model authoritatively and the ability of the States to come to agreement on a model run in the absence of Principia Mathematica was important to Kansas
    - Kansas feels strongly that any contract for model update work done on behalf of the RRCA should be with a neutral party
    - Kansas' concern was illustrated when Principia modeled Bonny Reservoir according to Colorado's proposal which the RRCA has not approved
  - Schneider stated that Nebraska is not comfortable rotating modeling duties among the 3 states and has concerns about cost and time involved with transitioning to a new consultant
  - **Nebraska will schedule another meeting in 3-4 weeks for the EC to meet and discuss only this agenda item**

## Notes from the October Meeting of the RRCA Engineering Committee

Drafted 10/30/2013

Kansas edits 11/08/2013

Nebraska edits 11/15/2013

- 5 Conservation Committee Terraces Study
  - Scott Guenther summarized status
  - **Reclamation will follow-up with Derrel Martin to address his comments, do final edits and distribute a final draft to the EC**
  - **Reclamation will also follow-up on the question of where the data will be housed**
  
- 6 Data Exchange for 2013 Accounting
  - No Discussion expected until April
  
- 7 Estimating Ground and Surface Water Irrigation Recharge and Return Flows
  - Beightel noted Kansas' perception that irrigation practices across the Basin have changed to generally become more efficient, asks if the other States are interested in participating in a study
  - **Kansas will provide a draft "Scope and Need" document to the EC regarding changes in irrigation efficiency through time**
  - Schneider pointed out Column 3 of Attachment 7 to the RRCA Accounting Procedures and asked if the Parties had any recollection on the reason this column has not historically been used
  - Schneider noted that Nebraska has installed new flumes on several surface water returns/spills and believes that Column 3 is intended to contain that data
  - Craig Scott noted that the BOR reports on the data given to them by the producers, so if they do not receive the data it would not be reported
  - Schneider noted that NDNR had granted a convey water permit involving Meeker-Driftwood and Bartley canals and believes that Column 3 of the accounting sheet should be used to properly account for this activity and other canal wasteways
  - Further discussion on Column 3 of Attachment 7 is tabled until the next meeting
  
- 8 Accounting Issues 2006-2012
  - **Before the next meeting each Party will make a list of any items in this category that are not already in arbitration and send them to the group**
  
- 9 Accounting Changes for Nebraska Groundwater Recharge Projects waiting for results of the Basin Study
  - Discussion needed on how to deal with non-irrigation season evaporation from canals
  
- 10 Future Augmentation Plans - Application and Approval Process
  - Discussion will wait until current arbitration is complete
  - Schneider noted that the TBNRD may be developing a new project

## Notes from the October Meeting of the RRCA Engineering Committee

Drafted 10/30/2013

Kansas edits 11/08/2013

Nebraska edits 11/15/2013

- 11 Harlan County Lake - Evaporation Charges and Compact Accounting Adjustments
  - Schneider summarized this year's agreement
  - Craig Scott noted that the 2013 proportioning of evaporation is consistent with historic Reclamation practice
  - Beightel described Kansas' proposal to calculate HCL evaporation in such cases
  - **Kansas will develop a proposal for calculating the incremental increase in reservoir area and assignment of evaporation and send it to the EC**
  
- 12 Budget to Accomplish Compact Goals
  - **Nebraska will send examples of the Blue River and North Platte Decree Committee budgets**
  - **Kansas will send examples of the Arkansas River Budgets with Colorado and Oklahoma**
  - **Colorado will send other example budgets**
  - The committee discussed funding such things as stream gages, studies, web/cloud storage of data, court reporters, and other meeting costs
  
- 13 Beaver Creek Stream Gage
  - Schneider explained that the Beaver Creek Stream Gage is in disrepair and will be moved to a near-by bridge
  - Schneider offered tours of the new location
  - **Nebraska will send a map showing the current and proposed gage locations**
  
- 14 Summary of Meeting Actions / Assignments
  - Schneider summarized the action items from the agenda
  
- 15 Future Meeting Schedule
  - **Nebraska will send out potential dates to hold an EC meeting in a few weeks**
  
  - The next regularly scheduled meeting is in January

## Notes from the November Meeting of the RRCA Engineering Committee

Drafted 11/26/2013

Corrected 12/19/2013

## Attendees:

Chris Beightel	Kansas	Ivan Franco	Colorado
Chelsea Erickson	Kansas	Jim Schneider	Nebraska
Sam Perkins	Kansas	Jennifer Schellpeper	Nebraska

- 1 Introductions
- 2 Review / Modify Agenda
  - Beightel proposed adding discussion on the budget at the end if there was time.
- 3 Review October Meeting Notes
  - No further comments were supplied. Comments are to be provided before finalization of the EC report for the December 19<sup>th</sup> RRCA meeting.
- 4 Modeling and Data Tasks for Principia Mathematica
  - Schneider summarized two potential ways to move forward in the immediate future: The RRCA signs one contract with Willem either using an outside entity such as the Nebraska Community Foundation, like the NPDC does or as an entity like the Blue River Compact OR the RRCA could investigate hiring a new 3<sup>rd</sup> party using an RFP process.
  - Beightel stated that KS is willing to begin the work on the RFP process. He also summarized his review of the current KS contract with Principia, and noted that the language is clear that Principia has no latitude to make judgment calls on how to complete the annual model runs.
  - Schneider and Franco agreed that the intent of each state's contracts are the same.
  - Schneider noted that there is little use in obtaining an official run from Principia while there are any disputed issues that affect the model run.
  - **It was agreed that Principia should continue work on the current calendar year, though the EC should review all three state's contracts with Principia to ensure that there is no latitude for Principia Mathematica to deviate from the standard procedures without prior approval by all three states. At the same time the EC will work to develop an RFP for a 3<sup>rd</sup> party contractor and continue to evaluate the costs and benefits of a new contractor.**
  - **Everyone agreed to circulate a copy of their current contract with Principia to the other members of the EC.**
  - **The EC drafted a report to the RRCA; this will be routed along with the meeting notes for review and comment.**
  - **Nebraska will research how the EC report becomes available on the website:**  
<http://www.republicanrivercompact.org/>
- 5 Budget
  - Discussion on the CO email occurred with agreement that further discussion would occur during the January meeting, with everyone following up on the action items in the October meeting minutes.
- 6 Summary of Meeting Actions / Assignments
  - Schneider summarized the action items from the agenda.
  - **Nebraska will include an Outlook mail invitation in future EC meeting emails.**
- 7 Future Meeting Schedule
  - The next regularly scheduled meeting is in January

Notes from the January Meeting of the RRCA Engineering Committee  
Drafted 2/24/2014

## Attendees:

Chris Beightel	Kansas	Jim Schneider	Nebraska
Chelsea Erickson	Kansas	Jennifer Schellpeper	Nebraska
Ivan Franco	Colorado	Carol Flaute	Nebraska
Willem Schreuder	Principia Mathematica		

- 1 Introductions
- 2 Review / Modify Agenda
  - No modifications were supplied.
- 3 Publication of RRCA Annual Reports
  - Erickson confirmed that the CDs were sent out in late December.
  - Schneider stated that Nebraska received the CD from Kansas.
  - Franco stated that he needed to find out if the CD had been received.
- 4 Modeling and Data Tasks for Principia Mathematica
  - Willem stated that the amended Colorado contract has gone out and is waiting on signatures.
  - Beightel confirmed that the Kansas contract is being routed for signatures.
  - **It was agreed to follow up on this in April.**
- 5 Conservation Committee Terraces Study
  - Reclamation was not present to give an update.
  - Erickson stated that Scott Gunther told her that he received the final draft from Derrel, is reviewing it, and will circulate it to the states in late January or early February.
  - **Willem will post the final report to the RRCA website as soon as he receives the DVD.**
- 6 Data Exchange for 2013 Accounting
  - Modeling
    - Bonny
      - Schneider stated that the dry reservoir problem needs to be addressed and that Colorado's proposal is one option.
      - Franco stated that Colorado is not in agreement with the old method and agreed that some consensus is needed.
      - Willem stated that he needs clarification on what the default modeling scenario is to account for the Bonny Reservoir empty condition.
      - **Beightel will get back to the group regarding the Kansas position on how to model Bonny Reservoir.**
    - # of Runs
      - Schneider stated that the preliminary data should be run by April and preferably a second earlier run sometime in late January/early February.
      - Beightel asked whether it is useful to do 2 early runs before the data are finalized in August and clarified that Kansas' concern is with spending funds wisely when documentation also needs to be completed.

Notes from the January Meeting of the RRCA Engineering Committee  
Drafted 2/24/2014

- Willem stated that estimating pumping using last year's data can give a pretty good picture of impacts, so there is some value to doing it now and getting a decent guess at this point to use for future planning. He also stated that limiting the number of model runs is not cost efficient as setting up the data is the time-consuming part, that there is value in comparison of early runs to later runs for quality control purposes.
  - Schneider stated that for Nebraska's management purposes, early runs are the most useful and suggested that the final runs might be the least valuable.
  - **Beightel will talk with other Kansas staff about not completing an August run.**
  - **It was agreed that Willem will begin the first 4 runs now, with 2 using the current method and 2 using Colorado's proposed method. 2 additional runs will be run once Kansas has worked through how they want Bonny to be modeled.**
  - Willem clarified that the 5-run procedure is already set up and ready to go.
  - Schneider summarized that **there will be three runs: one in late January or early February, one in April, and the final run.**
  - **Schneider will take the lead on making sure that this doesn't get pushed back to April.**
  - Documentation
    - Beightel – Kansas would like the documentation to be updated within the 2014 calendar year.
    - Willem stated the documentation could be updated to the same level of detail as the current documentation within the year, but if the goal is to describe the algorithms in greater detail, he would be unlikely to finish this year.
    - Beightel suggested that the group narrow the updates to topics that are of most interest. He suggested a level of detail so that a person experienced with groundwater modeling could replicate the work.
    - Willem clarified the documentation would explain what to do, not "why".
    - Schneider stated that **a continuing discussion of the documentation issue needs to occur in April.**
- 7 Estimating Ground and Surface Water Irrigation Recharge and Return Flows  
— Beightel stated that Kansas has not done anything with this yet.
- 8 Accounting issues for 2006-2012  
— Schneider stated that the utilization of direct returns for surface water accounting has not been used in the past but needs to be used in the future and described a specific canal where it would be especially helpful.  
— Beightel reminded Colorado and Nebraska that Kansas has asked for beginning and ending meter data. Kansas obtained some of these data through discovery, but Colorado and Nebraska have not sent any of these data yet. The lack of these data is preventing Kansas from finalizing accounting.  
— Franco stated that Colorado has no accounting issues to add.

Notes from the January Meeting of the RRCA Engineering Committee  
Drafted 2/24/2014

- Willem noted that Kansas was unhappy with how Bonny, which was dry May through December, was modeled in 2012.
  - **Beightel will take the Bonny Reservoir issue to the Kansas team for follow-up.**
  - **Schneider stated to keep this topic open, with the goal of having a complete list for the annual RRCA meeting.**
- 9 Accounting Changes for Nebraska Groundwater Recharge Projects
- Schneider stated that as these calculations were not done in 2012 because of the drought, there are more important items to deal with now. Some discussion is needed over how accounting procedures address evaporation and diversion at different times of the year.
- 10 Future Augmentation Plans – Application and Approval Process
- Schneider stated that it is necessary to get through the N-CORPE litigation and other disputes before progress can be made on this.
- 11 Harlan County Lake – Evaporation Charges and Compact Accounting Adjustments
- Beightel summarized the Kansas proposal regarding Special Water (Attachment A).
  - Schneider expressed that he has concerns about using mixed methods for Special Water and Project Water. He suggested examples be developed including using 2013 and other hypothetical examples.
  - All parties agreed that this would be useful.
  - **Kansas will put examples together.**
- 12 Budget to Accomplish Compact Goals
- Schneider summarized his understanding of the current status of this discussion: Kansas is interested in a budget to smooth out costs over time. Nebraska could accommodate working with a budget or not. It would be a challenge for Colorado to do so.
  - Franco confirmed that Colorado is not interested in a budget at this time. He acknowledged that a budget would be a useful tool for joint studies and suggested that if a joint study comes up, that might be a better time to talk about a budget.
  - Beightel stated that Kansas is also interested in a budget for ongoing expenses like year to year tasks and stream gages, and that it could help the States' annual planning. It would also benefit Kansas to smooth the budget out year to year.
  - Schneider suggested that the Engineering Committee has taken this issue as far as it can. This can be taken to RRCA with examples of how other compacts do it, a list of items that could be included, and reasons for having a budget.
  - Beightel suggested that it could also be useful to include an example of how the budget could work, such as a possible allocation per state.
  - **Beightel asked that this item be left on the agenda for next time while he follows up with Kansas to see if they feel the progress so far on this task is enough.**
  - Erickson suggested that the Engineering Committee recommend that RRCA set up a standing budget committee.
  - Schneider expressed support for a budget committee.
  - Franco suggested keeping the suggestion of recommending a budget committee in mind until after Beightel has had a chance to follow up with Kansas.



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Drafted 2/24/2014

- 13 Beaver Creek Stream Gage
  - Schneider stated that Nebraska did not get a map out due to personnel changes. He is unsure whether it has been moved yet.
  - **Schneider will have a full report on this topic at the next meeting.**
  
- 14 Summary of Meeting Actions / Assignments
  - Schneider stated that Actions and Assignments will be included on the meeting notes that are sent out.
  
- 15 Future Meeting Schedule
  - The next meetings are scheduled for April 23 and July 23, both @ 1pm Central Time, 12 pm Mountain Time.

Kansas Proposal to Calculate and Assess Evaporation Charges for Certain Special Water  
Impounded in Harlan County Lake

Submitted to the RRCA Engineering Committee  
on  
January 21, 2014

1. Special Water may include, but is not limited to, water impounded in Harlan County Lake pursuant to Nebraska Compact Call Year administration.
2. Special Water shall be designated upon the agreement of Kansas and Nebraska.
3. Evaporation of the Special Water pool shall be calculated by:
  - a. Determining the incremental increase in surface area caused by the Special Water pool, and
  - b. Distributing the total evaporation, daily and *pro rata* according to surface area, between the Special Water pool and the remaining pool
4. Kansas shall be charged in the RRCA Accounting with all evaporation losses suffered by the Special Water pool for the accounting year.

Meeting Notes for the  
**QUARTERLY MEETING of the  
ENGINEERING COMMITTEE of the  
REPUBLICAN RIVER COMPACT ADMINISTRATION**  
April 28, 2014, 3:30 PM Central, 2:30 PM Mountain

## Attendees:

Chris Beightel	Kansas	Jim Schneider	Nebraska
Chelsea Erickson	Kansas	Jennifer Schellpeper	Nebraska
Ivan Franco	Colorado	Craig Scott	Reclamation
Willem Schreuder	Principia Mathematica	Scott Guenther	Reclamation

1. Introductions
2. Review / Modify Agenda
  - a. At Beightel's suggestion, the agenda was revised to move "Documentation" from 6c (under "Data Exchange for 2013 Accounting) to 4b (under "Modeling and Data Tasks for Principia Mathematica").
3. Publication of RRCA Annual Reports
  - a. Colorado received a copy of the reports via download from an FTP site.
4. Modeling and Data Tasks for Principia Mathematica
  - a. Follow up on Email Discussions
    - i. The Kansas contract has been executed.
    - ii. Modeling runs
      1. Willem has executed three modeling runs so far.
      2. He evaluated two differences: (1) the 5-run procedure vs. the original procedure and (2) Bonny Reservoir dry vs. full.
      3. The three runs were (1) original procedure, Bonny Reservoir dry, (2) original procedure, Bonny Reservoir full, and (3) 5-run procedure, Bonny Reservoir dry. The 5-run procedure and the Bonny Reservoir procedure have effects only in different stream reaches from one another, so it was not necessary to do a fourth run.
      4. Beightel said Kansas is happy with the three runs that were done.
      5. Beightel asked a question about the impacts that Willem was referring to. Willem clarified that he was referring to a visual comparison of the columns on the Impacts 2013 page.
  - b. Documentation
    - i. Willem stated that the update can be done in a few months if the level of detail is similar to that on the current website.
    - ii. Status: each state pre-processor has been updated, but the documentation is not updated.
    - iii. There was some discussion about the appropriate level of detail. In striking a balance between detailing the small nuances that need to be adapted year to year and keeping the overall logic in plain view, lean towards the latter.

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- iv. **Willem will try to get the documentation finished before the July EC meeting.** He will ignore the CCP pipeline for now since it does not apply to 2013.
5. Conservation Committee Terraces Study
    - a. Reclamation discussions with Derrel Martin, final draft, and data housing
      - i. Guenther received a copy of a revised report from Derrel Martin in January and sent it to the states in February with a 30 day review period. They later received comments from Chelsea and are in the process of incorporating those comments. **Reclamation will try to complete this report by the end of May 2014.**
      - ii. Guenther mentioned discussing with Jesse Bradley in March the possibility of one of the states collecting the data from this study and housing it in a central place. **Guenther will follow up with Bradley to revisit this topic.** Willem can put the data on the RRCA website without an increase in his costs, but the data will need to be sent to him on a DVD first. It would be best for them to include information describing what the various files represent and what they were used for (especially shapefiles).
      - iii. **This item will be kept on the agenda for the July meeting and the Bureau of Reclamation will be kept on the mailing list.**
  6. Data Exchange for 2013 Accounting
    - a. Schneider gave an update on Nebraska's status. Most of their data was posted on the 15<sup>th</sup>, but they have not finalized the preliminary datasets for the model. Progress has been delayed by Paul's health issues, but they are very close to finished. Paul is hopeful that it will be finished later this week. **Willem will wait for the Nebraska data to finalize the April runs.**
    - b. Bightel gave an update on Kansas's status. Data were posted before the 15<sup>th</sup>. Note that there are some empty groups (dead cells) at the edge of the model – about 200 acres. Willem explained how this was handled. He will try to streamline this process for the next go-around.
    - c. Franco gave an update on what was done differently for Colorado this year: 2013 pumping, CIR method vs metered data. The difference between these two methods was less than 10%.
    - d. **Everyone will try to have all data finalized and exchanged by the July 22 meeting.**
  7. Estimating Ground and Surface Water Irrigation Recharge and Return Flows
    - a. Bightel – **Kansas is still working on a scope and needs document.**
    - b. **This item will be kept on the agenda for the July meeting.**
  8. Accounting Issues for 2006-2012
    - a. Schneider summarized the previously discussed issues.
      - i. We need to start using direct return data from canals from the Bureau of Reclamation (table 7 in Accounting Procedures).

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- ii. Beginning and ending meter readings are still an issue for Kansas.
9. Accounting Changes for Nebraska Groundwater Recharge Projects
- a. Discussion on how accounting procedures address evaporation and diversion at different times of the year
    - i. Schneider summarized the problem: 2014 is dry, so Nebraska will need to discuss this later when there is enough water available to use for recharge projects. Under the standard assumption, 18% is charged as evaporation. Is that appropriate in the off-season or ice-over conditions when less evaporation is occurring?
    - ii. **Beightel needs to bring this up with the Kansas team.**
    - iii. **Nebraska will summarize evaporation data monthly for a couple of reservoirs.**
10. Future Augmentation Plans – Application and Approval Process
- a. This item is held up until arbitration is wrapped up. **It may be possible to talk about this and move forward on it at the July meeting.**
11. Harlan County Lake – Evaporation Charges and Compact Accounting Adjustments
- a. Kansas examples for calculating the incremental increase in reservoir areas
    - i. Schneider: Bostwick Irrigation Districts have remaining project water that they have agreed to transfer to the Frenchman-Cambridge Irrigation District by storing some water upstream. Because of this, Nebraska-Bostwick is not likely to have any diversions of storage during the irrigation season or share in any evaporation.
    - ii. **Kansas is still working on examples.**
12. Budget to Accomplish Compact Goals
- a. Kansas update from internal discussions
    - i. Beightel: Kansas is ok with doing a budget, but will not press hard for it if no one else is interested. There has been enough progress on this to kick it up to the commissioners.
  - b. Schneider: The EC will tell RRCA that the EC has looked at ways of doing a budget, a budget can be done if they choose to do so, and the EC recommends that they form a budget committee. All agreed, so the budget task is complete for this year.
13. Beaver Creek Stream Gage
- a. Nebraska Report (Schneider)
    - i. Nebraska sent a map (Attachment A) out to everyone and is waiting for a shipment of new gage houses to come in. **Nebraska will inform everyone else when the gage gets moved.**

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- ii. Meeting with USGS – NSIP (National Streamflow Information Program) got an increased allocation of funds in the budget. Asked for recommendations of which gages would be appropriate for them to take over. This one, Medicine Creek below Harry Strunk, and the Republican River at Guide Rock are all already in the NSIP inventory, so Nebraska suggested that those would be good ones for USGS to pick up. Compact language says that USGS is supposed to be doing these gages.

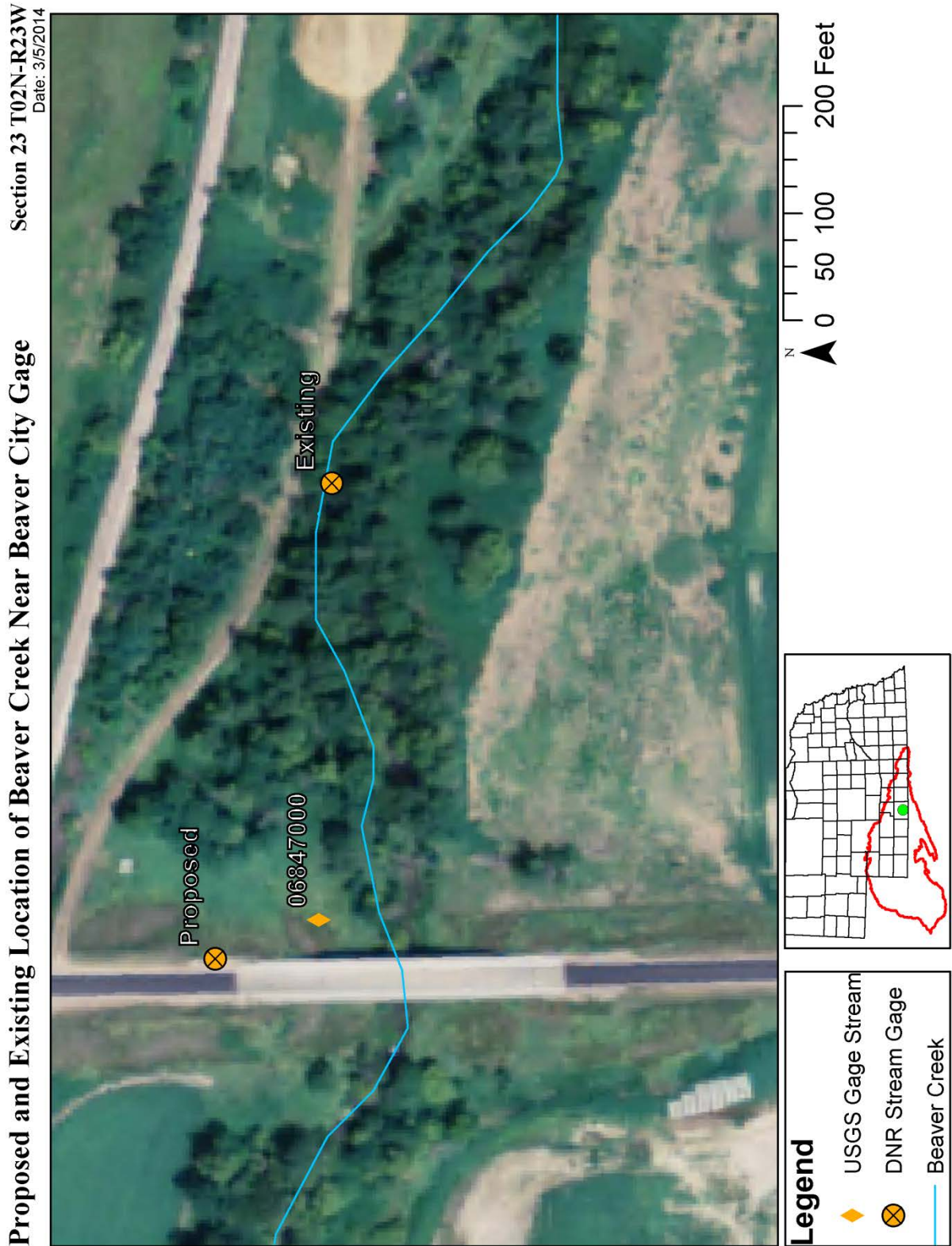
14. Summary of Meeting Actions / Assignments

- a. Assignments will be summarized in the notes.

15. Future Meeting Schedule

- a. July 23 at 1:00 pm Central Time.

# Proposed and Existing Location of Beaver Creek Near Beaver City Gage Submitted to the RRCA Engineering Committee April 28, 2014



Meeting Notes for the  
**QUARTERLY MEETING of the  
ENGINEERING COMMITTEE of the  
REPUBLICAN RIVER COMPACT ADMINISTRATION**  
August 14, 2014, 9:30 AM Central, 8:30 AM Mountain

## Attendees:

Jim Schneider	Nebraska	Chris Beightel	Kansas
Jennifer Schellpeper	Nebraska	Chelsea Erickson	Kansas
Paul Koester	Nebraska	Willem Schreuder	Principia Mathematica
Brian Dunnigan	Nebraska	Scot Guenther	Reclamation
Carol Flaute	Nebraska	Craig Scott	Reclamation
Ivan Franco	Colorado		

1. Introductions
2. Review/Modify Agenda
  - a. At Schneider's suggestion, the agenda was revised to include an additional item for "List of Additional Issues Preventing Finalization of Accounting" after agenda item number 7 ("Estimating Ground and Surface Water Irrigation Recharge and Return Flows").
3. Publication of RRCA Annual Reports
  - a. All states have received the 2007 to 2012 reports
  - b. Erickson gave an update on the states of the Annual Reports for 2013. Kansas is working through them now and does not have an exact date for when they expect them to be finalized. Beightel indicated that he thought having them ready for approval at the Annual Meeting would be ambitious given how many of them there are to review. He suggested the following process: **Kansas will get one 2013 meeting's materials together at a time to send to Colorado and then Nebraska for review and Nebraska will return their comments to Kansas. If additional review is necessary, they will be sent around to all states again.** Schneider and Franco agreed.
4. Modeling and Data Tasks for Principia Mathematica
  - a. Documentation
    - i. Willem reported that he has made no substantial progress on this task. It is going to take much longer than he originally estimated due to the need to describe the small procedural differences that changed each year.
    - ii. Beightel asked for reaffirmation on the purpose of the documentation. Willem summarized that he is documenting both historical and current processes with the ultimate goal of describing both how we currently do things and how things have changed over time such that if the documentation is passed on to a third party groundwater modeler, the historical calculations could be duplicated.
5. Conservation Committee Terraces Study
  - a. Reclamation discussions with Derrel Martin, final draft and data housing
    - i. Guenther reported that he sent out a final draft of the report in mid-July, with hard copies for the Administration Committee and PDFs to everyone else.
    - ii. One task still remains, which is to review the collected data that were used for the report. **Guenther hopes to be able to send a DVD of the data to Willem for**



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**posting within the next few months.** Guenther clarified that the purpose of the data review is to identify whether the Conservation Committee has pulled together all of the data used in the study and also to try to document the data better.

- iii. Beightel stated that Kansas would like to have someone from Reclamation at the Annual Meeting to be formally on the record saying that the report is finished and to give an overview of the status of the data and where it will be housed. Schneider and Franco agreed. **Guenther and Scott will arrange for someone to give this report at the Meeting.**

6. Data exchange for 2013 Accounting

a. Exchange update

- i. Schneider stated that Nebraska's data are final.
- ii. Franco explained that Colorado's data have not been finalized because the 2013 crop statistics in the annual bulletin are not yet available. He is hoping to receive the crop statistics next week, and **Willem is ready to get the Colorado data finalized as soon as the missing information becomes available, which should be before the Annual Meeting.** The current runs for Colorado data include values from 2012, but switching to the 2013 values when they become available will make a slight difference in the results.
- iii. Willem identified a problem with Kansas's data involving 3 cells with large acreage. **Beightel stated that Kansas will find the source of the error and fix it. He hopes to send the corrected data today.** Willem stated that it will not take long to run the Kansas data again once the correct data are sent.
- iv. Beightel asked Franco why the Colorado runs were still based on crop distribution information even though Colorado had metered data available this year. Franco explained that metered data are still missing in a small portion of the basin. Even though it is only a small percentage of the total number of wells in the basin, Colorado will wait to switch calculation methods until they have metered data for 100% of their wells.
- v. Schneider stated that **the Engineering Committee will include the most recent products of Willem's work in the EC report.**

7. Estimating Ground and Surface Water Irrigation Recharge and Return Flows

- a. KS draft scope and need document regarding changes in irrigation efficiency
  - i. No update was provided.

8. List of Additional Issues Preventing Finalization of Accounting

- a. Schneider inquired whether Kansas had discussed using return flow data in Table 7 of the Accounting procedures. Beightel said that he did discuss it with the Kansas team, but did not make it clear to them that this was something that Nebraska considered to be holding up finalization of accounting. **Beightel will bring this issue to the Kansas team again. Schneider stated that Nebraska would provide a simple write-up of the issue for Kansas.** Schneider also underscored the situation in the context of the Meeker-Driftwood

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Canal, where they are passing water through to run it to Bartley because of improved conveyance to the Bartley Canal.

- b. Beightel indicated that Kansas's previously raised issues related to beginning and ending metered data and wanting metered data from Colorado are essentially the same issue. Schneider asked why Kansas has not pursued the option, given to Kansas in the Settlement, to do site visits to check whether the other states are reading their meters right. Beightel clarified that Kansas has considered checking that, but that they think the data is there and just want to look at it. They are operating under a trust-but-verify model. They just want to see the raw data so that they can get comfortable with it.
  - c. The issues with modeling Bonny Reservoir should also be on the list.
  - d. No additional issues were raised at the meeting, but **Beightel stated that he will check with the Kansas team one more time.**
9. Accounting Changes for Nebraska Groundwater Recharge Projects
- a. Discussion on how accounting procedures address evaporation and diversion at different times of the year
    - i. Kansas update from internal discussions
      1. Beightel said that Kansas will consider a proposal to evaluate potentially changing how the accounting procedures address evaporation and diversion at different times of the year.
    - ii. Nebraska reservoir evaporation data summary
      1. Schneider stated that Nebraska looked at some reservoir evaporation data but did not get far enough to be able to send it out to the rest of the Committee, **and will provide a review at a future meeting.** He said that it looks like there's a good potential for using reservoir evaporation data as a surrogate. **We will put into the report that we will continue to look into this next year.** Once the drought is over, there is a lot of potential benefit to both Kansas and Nebraska to be able to retain the water instead of sending water downstream that no one can use.
10. Future Augmentation Plans - Application and Approval Process
- a. There was no discussion of this issue at this meeting, except to mention that it has been brought up at the larger state group's meeting.
11. Harlan County Lake - Evaporation Charges and Compact Accounting Adjustments
- a. KS examples for calculating the incremental increase in reservoir areas
    - i. Beightel stated that Kansas does not have anything to send out about this yet, and suggested that it may be a conversation for the larger state group.
12. Beaver Creek Stream Gage
- a. Nebraska Report
    - i. Schneider stated that the Beaver Creek Stream Gage has been moved and has been in place for about a month.
    - ii. Schneider gave an update on the status of the stream gages that the USGS will assume responsibilities for. Nebraska provided the USGS with a list of four

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stream gages that would be suitable: Beaver Creek, Medicine Creek below Harry Strunk, Republican River at Guide Rock, and Republican River at Benkelman. USGS has responded that they will only manage three of the four. Nebraska is still in negotiation with USGS about which three gages will be taken over by USGS. USGS would prefer to do the three Compact gages, but for logistical reasons, Nebraska would prefer that USGS do Benkelman instead of Medicine Creek.

- iii. Schneider reported that Nebraska installed two additional gages on Medicine Creek above the reservoir. These gages will be visited during the September tour. Beightel asked whether data from these gages is available. Schneider responded that Nebraska is working on real-time data availability for all of its gages and will be launching a beta version online soon.

13. Summary of Meeting Actions / Assignments

a. Draft Engineering Committee Report

- i. **Nebraska will update the draft report based on today's discussions and will send it out to Kansas and Colorado as soon as possible for review. Comments should be returned by the Friday before the meeting.** Kansas and Colorado should pay special attention to verifying details like the dates for data exchange.
- ii. For assigned Task #12 in the EC Report (exploring the possibility of an RFP), we will note that we had discussions about it but didn't get anything developed this year. Schneider asked whether the EC wanted to keep this as an ongoing assignment or consider it complete, that an RFP was not necessary. **Beightel will ask the Kansas team for input.**
- iii. For ongoing tasks transferred from last year's task list to this year's list, the biggest change is that last year's list of tasks included identifying issues preventing finalization of accounting data, whereas this year's suggested list has been changed to working on the specific issues that are identified in this year's report.
- iv. Willem asked whether he should continue to do the three separate runs (Bonny dry vs. full and original procedure vs. five-run procedure). All agreed that he should continue doing all three until those issues are sorted out. Beightel added that it was interesting to compare the three runs to be able to see the magnitude of difference in the outputs.
- v. Willem mentioned that he put up the 2014 update that was required under the one year augmentation plan. Schneider agreed **that this should be included on the report's list of other items discussed.** Schneider asked whether Willem planned to do any additional updates. Willem said yes, because he was still waiting on information from Colorado about the amount of pumping for the last couple of months of the year. He anticipates having this information before September 1. Schneider asked whether Willem would use August meteorological data. Willem said no, because August meteorological data will not be available before September 1, which is when the report is due.

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## Impact 2013 (acre-feet)

Location	Colorado Pumping			Kansas Pumping			Nebraska Pumping			Nebraska Mound		
	Dry Bonny RRCA-runs	Full Bonny RRCA-runs	Dry Bonny 5-Run	Dry Bonny RRCA-runs	Full Bonny RRCA-runs	Dry Bonny 5-Run	Dry Bonny RRCA-runs	Full Bonny RRCA-runs	Dry Bonny 5-Run	Dry Bonny RRCA-runs	Full Bonny RRCA-runs	Dry Bonny 5-Run
Arkaree	458	458	458	197	197	197	126	126	126	0	0	0
Beaver	0	0	0	2985	2985	2985	1999	1999	1999	0	0	0
Buffalo	428	428	428	0	0	0	3349	3349	3349	0	0	0
Driftwood	0	0	0	0	0	0	1049	1049	1049	0	0	0
Frenchman	1125	1125	1125	0	0	0	76871	76871	76788	0	0	0
North Fork	15647	15647	15647	0	0	0	1059	1059	1059	0	0	0
Above Swanson	-1931	-1935	-1931	136	64	136	8910	8910	8910	0	0	0
Swanson - Harlan	-15	-15	-16	600	600	-842	26189	26189	9004	2044	2044	2044
Harlan - Guide Rock	0	0	0	0	0	0	24680	24680	24326	379	379	379
Guide Rock - Hardy	0	0	0	91	91	91	2306	2306	2312	-11	-11	-11
Medicine	0	0	0	0	0	0	20102	20102	19619	9992	9992	9992
Prairie Dog	0	0	0	608	608	608	0	0	0	0	0	0
Red Willow	0	0	0	0	0	0	5517	5517	5455	35	35	35
Rock	103	103	103	0	0	0	4452	4452	4452	0	0	0
Sappa	0	0	0	-663	-663	-699	990	990	985	0	0	0

http://www.republicanrivercompact.org/restricted/2013/html/2013.html

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South Fork	3315	10864	3315	1855	2558	1855	471	471	471	0	0	0
Hugh Butler	0	0	0	0	0	0	1963	1963	1963	0	0	0
Bonny	-1206	1377	-1206	0	13	0	0	0	0	0	0	0
Keith Sebelius	0	0	0	519	519	519	0	0	0	0	0	0
Enders	0	0	0	0	0	0	4723	4723	4723	0	0	0
Harlan	0	0	0	79	79	79	774	774	778	24	24	24
Harry Strunk	0	0	0	0	0	0	300	300	301	0	0	0
Swanson	17	17	17	0	0	0	275	275	275	0	0	0
<b>Mainstem</b>	<b>-1946</b>	<b>-1950</b>	<b>-1946</b>	<b>835</b>	<b>763</b>	<b>-607</b>	<b>62085</b>	<b>62085</b>	<b>44552</b>	<b>2413</b>	<b>2413</b>	<b>2413</b>
<b>Total</b>	<b>17951</b>	<b>28078</b>	<b>17951</b>	<b>6420</b>	<b>7064</b>	<b>4942</b>	<b>186106</b>	<b>186106</b>	<b>167944</b>	<b>12475</b>	<b>12475</b>	<b>12475</b>

The 53<sup>rd</sup> Annual Report of the Republican River Compact Administration for 2013 is hereby approved by unanimous vote on this the 24<sup>th</sup> day of August, 2016.

DATE SIGNED:

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Dick Wolfe, Chairperson & Colorado Commissioner

DATE SIGNED:

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Gordon W. Fassett, Nebraska Commissioner

DATE SIGNED:

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David Barfield, Kansas Commissioner