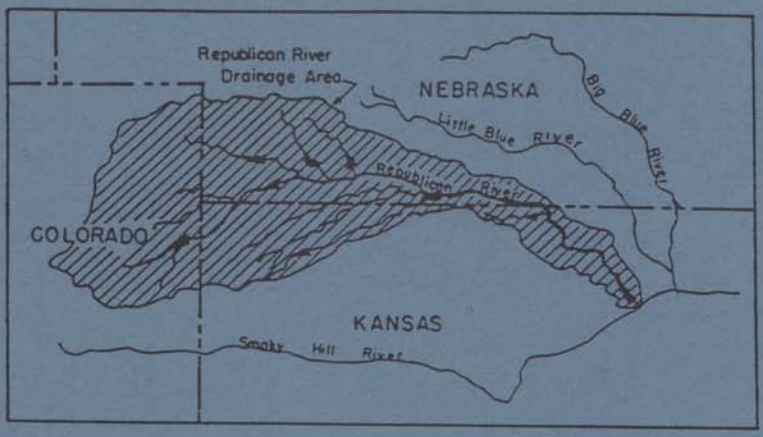
REPUBLICAN RIVER COMPACT ADMINISTRATION

THIRTY FIRST ANNUAL REPORT



For The Year 1990

Steamboat Springs, Colorado

July 19, 1991

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THIRTY-FIRST ANNUAL REPORT

REPUBLICAN RIVER COMPACT ADMINISTRATION

In conformity with the Rules and Regulations of the Republican River Compact Administration, the Thirty-First Annual Report is submitted as follows:

1. Pursuant to Rule 12, as amended, this report covers the period from June 29, 1990 to July 19, 1991.

2. Members of the Republican River Compact Administration are the officials of each of the states who are charged with the duty of administering the public water supplies and are as follows:

   Jeris A. Danielson, State Engineer, Colorado

   J. Michael Jess, Director, Department of Water Resources, Nebraska

   David L. Pope, Chief Engineer-Director, Division of Water Resources, State Board of Agriculture, Kansas

3. The Thirty-Second Annual Meeting of the Administration was held on July 19, 1991, at Steamboat Springs, Colorado. The minutes of the meeting are included in this report.

4. During the period covered by this report, one meeting of the Engineering Committee was held. A report from that committee together with summary tabulations of the computed annual water supply and consumptive use for the 1990 water year in the Republican River Basin were presented and accepted by the Administration and are included in this report.

5. Reports were received from the Bureau of Reclamation on operation and administration of their projects in the basin of the Republican River and by the U.S. Geological Survey on their gaging stations in the same basin.

6. By consensus, Jeris A. Danielson, Colorado member of the Administration, served as Chairman from July 1990 to July 1991.

MINUTES
32nd ANNUAL MEETING
REPUBLICAN RIVER COMPACT ADMINISTRATION

The meeting was called to order by Chairman Danielson at 9:00 am, July 19, 1991 at the Sheraton Hotel in Steamboat Springs, Colorado. Those in attendance were:

Name	Agency	Location
Jeris A. Danielson	Colorado Commissioner	Denver, Colorado
David L. Pope	Kansas Commissioner	Topeka, Kansas
Russell Oaklund	Dept. of Water Resources	Cambridge, Nebraska
Hal Simpson	Div. of Water Resources	Denver, Colorado
Alan Berryman	Div. of Water Resources	Greeley, Colorado
Keith Vander Horst	Div. of Water Resources	Denver, Colorado
Ed Blank	Div. of Water Resources	Steamboat, Colorado
Sally Lewis	Div. of Water Resources	Steamboat, Colorado
Kent Holt	Div. of Water Resources	Steamboat, Colorado
Leland E. Rolfs	Div. of Water Resources	Topeka, Kansas
Gerald E Hilmes	Div. of Water Resources	Topeka, Kansas
Bob Kutz	Bureau of Reclamation	Grand Island, Nebraska
Ben Saunders	Ground Water Mgmt. Dist.	Holyoke, Colorado

Chairman Danielson welcomed those in attendance. Due to the absence of Commissioner Michael Jess of Nebraska he reviewed the following rules of the Administration for convening an annual meeting. Rule 7 charges the Chairman with notifications of time and date for the annual meeting. Rule 9 requires that a meeting be held before August 1 of each year and as a result the meeting could not be deferred to accommodate all schedules. Rule 10 states that action can be taken by two states by unanimous vote. Rule 5 allows a commissioner to appoint a representative by letter to represent the commissioner. Russell Oaklund was in attendance on behalf of Nebraska but did not have a letter from Commissioner Jess appointing him as an authorized representative. Commissioner Danielson therefore indicated that Mr. Oaklund could act as an observer but could not vote.

Approval Of Minutes

The minutes of the 31st annual meeting had been previously circulated, reviewed, and signed by all commissioners. Chairman Danielson asked for any corrections or additions. Commissioner Pope noted for the record that Scott Ross is from Stockton, Kansas. Chairman Danielson stated that the record would reflect this correction and that the minutes would stand as approved.

Report of the Chairman

Chairman Danielson stated that the monitoring of water levels in the high plains shows an average decline in the Ogalalla aquifer of about 1 foot annually. This represents a continued overdraft.

The three Bureau of Reclamation high plains recharge demonstration projects within Colorado have been dropped at the request of the local sponsors due to the inordinate demands of the EPA for water quality monitoring. Monitoring costs have escalated from 5% of project costs to as much as 70% of costs. Additionally, there were local concerns that the EPA would take undesired action on farmers upon acquisition of water quality data.

The Ground Water Commission will meet in August to conduct rule making hearings governing the use of the Ogalalla aquifer in order to adopt, as rules, policies which have been in effect for 20 to 30 years. A major change which the Commission has instituted during the past year is in revising the criteria used to determine issuance of new well permits. The 40% aquifer depletion in 25 years criteria has been changed to a 40% depletion in 100 years.

The Colorado Department of Health is in the process of propagating water quality regulations which will govern the use of water in the high plains. Initially established as classifications for domestic and agriculture, a re-assessment as to possible standards is in progress because the ambient quality prior to human impacts was already below the EPA's minimum safe drinking water standards. Because the entire Ogalalla Aquifer is used for domestic purposes the concern exists that the Department of Health would take action preventing any further water quality degradation in that aquifer, such as preventing all application of agricultural chemicals.

Chairman Danielson introduced the staff in attendance from the Colorado Division of Water Resources.

Report of the Kansas Commissioner

Commissioner Pope introduced the Kansas staff in attendance and expressed thanks to Colorado for hosting this year's meeting.

Commissioner Pope proceeded to discuss relevant legislation. Statewide legislation impacting the basin involved a bill expanding previous laws giving the Chief Engineer power to require water conservation plans by individual users. In addition to requiring water conservation plans for new users and users requesting changes in use, the Chief Engineer now has the power to require existing water users to implement water conservation measures. He was also to identify basins within the state where conservation measures would be of help in making water available for other users. Of

help in these areas is Kansas' extensive water use reporting system and resulting data base.

The upper portion of the basin in northwest Kansas, specifically the alluviums, has been closed to new appropriations for the past 7 or 8 years. A district wide moratorium on new permits into the Ogalalla has been in effect so a study can be done on water availability, recharge, and safe yields. Aquifer wide water level declines, while varying between 0.1 and 1.5 feet, have been similar to Colorado's declines in averaging about .75 to 1 foot per year. The local water district is studying the possibility of obtaining zero net depletions from the Ogalalla. The obvious affect of this would have to be a large reduction in existing uses.

The lower basin within Kansas has not been historically viewed as water short but a moratorium on new permits has been in effect for the past few years. If the area is reopened to new permits it would be on a very restrictive basis. Kansas anticipates substantial shortages of water in the lower basin for 1991. Irrigation project deliveries will be much reduced. Flows in the Republican are presently about one-third to one-half of normal.

Commissioner Danielson requested a copy of the new Kansas water conservation bill. He also asked how the prior appropriation doctrine would be applied if users were not willing to implement water conservation procedures. Commissioner Pope responded that administration may be based on an applicant's need for water using reasonable current technology and elimination of waste.

Commissioner Pope reported that the statewide water fee program had collected $16 million the last fiscal year. The majority of the money is used for water project items. State agencies receive little of this for operational purposes.

Report of the Nebraska Representative

Mr. Oaklund reported that Commissioner Jess has required metering devises to be installed on both mainstem and tributary appropriators between Harlan County Dam and the Guide Rock Diversion Dam by July 1, 1991. Not all pumpers were able to meet the deadline due to the short time frame and meter manufacturer delays.

L.B. 732 created a new court of appeals. Decisions of the director of the Department of Water Resources may be appealed to this court rather than directly to the Nebraska Supreme Court. L.B. 51 clarifies the ability to use water management areas for quality purposes. L.B. 278 assigns to the applicant the expense of providing public notice for Department of Water Resources hearings.

Administration of water is presently occurring on the Republican mainstem and tributaries. Junior permits are closed and

senior permits are regulated on Medicine Creek, Red Willow and Frenchman Creek as well as on the mainstem of the Republican River from Trenton to the Cambridge Diversion Dam. Mainstem permits from Harlan County Dam to Guide Rock Diversion Dam have been regulated. If inflow into Harlan County Reservoir stops, downstream junior permits may be closed. 80 acres under the Naponee Canal project have been canceled.

Report of the Bureau of Reclamation

Mr. Bob Kutz provided information on relevant Congressional legislation. In June The House has passed an omnibus bill which included a Gejdenson amendment requiring surface irrigators on federal reclamation projects to pay full cost pricing of their water if they are under crop set aside or other crop payment programs. Full cost pricing represents costs of $80 to $90 above what irrigators are now paying. While the aim of this legislation is at California irrigators it would have a large impact on midwestern farmers. The Senate has not taken this up yet.

A budget bill allowing lining of 1.2 miles of canal in the Bostwick Unit is making its way through congress.

1990 precipitation amounts in the basin varied form a low of 82% of normal at Lovewell Reservoir to a high of 109% of normal at Bonny Reservoir. Generally amounts were below normal but not to the extent of being in a drought. 1991 precipitation amounts are generally at or above normal. A high of 141% of normal is occurring at Hugh Butler Reservoir.

In 1990 Harlan County Reservoir recorded a record low inflow. Nearly all reservoirs have had reduced inflows resulting in low project deliveries to surface irrigators this year.

In January of 1991 the Bureau of Reclamation projected that Harlan County Reservoir would be drawn down to 1927 feet, which was considered the bottom of the active pool, providing irrigators 11 inches of water per acre. Subsequently the Corps of Engineers, after review of recreation uses, informed the Bureau that riprap extended down to only 1928 feet and consequently the water level would not be allowed to drop below 1931 feet for safety reasons. As a result irrigators could receive as little as 6 inches of water. Mr. Kutz gave Bureau reasons for believing there was not a dam safety problem and that additional water could be released. The Corps has stated that it wants to study costs, benefits, and affects on all reservoir users before proceeding to modify riprap. The Bureau feels existing project authorization allows work on the riprap to proceed without further study.

Public hearings on the operation of the reservoir have been held. Others including the Nebraska and Kansas Congressional delegation have written the Corps on behalf of the irrigators. As

a result the Corps may be reconsidering its position, at least for the short term.

To assist the irrigators Mr. Kutz will be talking to the districts urging them to consider R & B loans to bury small laterals and pipe. This will provide enough head to go to gated pipe deliveries and increase efficiencies. His office will also study recommending changes in operational delivery of stored water so irrigators will receive more than the projected 6 inches.

A graph showing Harlan County Reservoir inflows on a 10 year running average basis was shown to the commissioners. The Bureau attributed early initial declines in inflow to development of upstream federal projects in the basin. Later period declines were attributed to an increase in ground water development. Water conservation practices were not believed to be a major contributor to the declines. Copies of this graph, 1990 & 1991 operations reports, Mr. Kutz's letter to the Corps of Engineers explaining the Bureau's position on Harlan County Reservoir, and additional historic precipitation and reservoir inflow data was distributed to the commissioners.

Commissioner Pope expressed support for the Bureau's position on Harlan County Reservoir. He observed that under the Corps position the Kansas and Nebraska allocations could not be fully delivered. The possibility was discussed that the Corps was posing a dam safety issue to keep water in the reservoir for recreation purposes.

Mr. Kutz stated that both Bostwick project contracts terminate in 1996 and will need to be recontracted by January 1, 1997. This well be a major undertaking.

Commissioner Danielson observed that the Bureau hydrographs showed a marked decrease in inflows to several reservoirs and asked whether the Bureau had considered legal action to remedy the upstream depletions. Mr Kutz stated that the Bureau had in the past considered some legal action for Ender Reservoir but had been told by their lawyers that they would have to target each well owner rather than the state involved rendering action impractical.

Commissioner Pope read a draft letter to the Corps expressing the opinion that the primary uses of Harlan County Reservoir are for irrigation purposes and the various states hold the rights and responsibilities for distributing the water under the compact. He proposed the letter be sent by the administration. Commissioner Danielson recommended that Commissioner Pope finalize the language, and if acceptable to all states then provide it to him for signature as chairman.

Mr. Kutz provided figures showing that the irrigation districts below Harlan County Reservoir paid to the United States $750,000 in 1990 and produced crops valued at $18 million. 1991

crop losses from irrigation reductions could be in the millions of dollars. The estimated riprap repair costs are between $2 million and $3.5 million.

Per discussion from last year's meeting Commissioner Danielson asked if the Bureau had found anything further on the roll of ground water in the compact. Mr. Kutz stated they had not.

Report of the Engineering Committee

Mr. Hal Simpson, this year's chairman of the committee, gave the report. In order to save time and money the committee meet by conference telephone call on May 13, 1991. The only actions requiring attention were the normal computations of determining the virgin water supplies and consumptive uses for the water year 1990. The committee's computations were presented in Table 1 and Table 2 of the committee's report. Mr. Simpson stated that Colorado had discovered errors in reporting their amounts of surface diversions on the South Fork, which will require corrections to the tables as presently provided. Ann Bleed, who produces the tables, had been unable to provide corrected figures prior to the administration meeting. Corrected tables will be substituted in the report as soon as they are available. The corrected values for the south Fork Sub-basin were read to those present.

Due to below average precipitation and runoff, 8 of 13 sub-basins had their allocations of consumptive use reduced from the original allocations. Colorado used 71% of its total adjusted allocation, Kansas used 49% of its total adjusted allocation, and Nebraska used 112% of its total adjusted allocation. The total basin consumptive use for 1990 was 429,860 acre-feet which is an increase of 16,640 acre-feet over 1989. This increase is likely due to dryer conditions and increased ground water pumping in all 3 states.

The committee reviewed how each state computes consumptive use by ground water to determine if they are following consistent procedures. Colorado and Kansas are using wells constructed into and diverting water from the alluvium of the streams in the basins. Nebraska is using wells in a band two miles wide, one mile on either side of a stream, but is in the process of revising its procedure to also use wells constructed in the alluvium. Nebraska stated that this revision will be complete for the 1991 year computations. Mr. Oaklund stated that 4 wells constructed during 1990 into the alluvium outside of the one mile limit were included in the computations for water year 1990.

Commissioner Pope commented that Kansas has a great concern that consumptive use is exceeding allocations in a number of sub-basins. He noted that Nebraska exceeded adjusted allocations in most of their sub-basins. Nebraska also exceeded its allocation for the state as a whole by 112%; Kansas went over in a couple of sub-basins, and Colorado went over in one sub-basin. He believes

a more serious problem exists than is first evident by looking at use of total state allocations.

Commissioner Pope moved that the report of the engineering advisors be accepted. Commissioner Danielson seconded and the report was accepted with the understanding that corrected tables 1 and 2 will be provided.

Unfinished Business

Commissioner Pope reiterated Kansas' concerns as expressed over the past few years about the method of including ground water in the computations. He believes the views of Nebraska, such as were given in the recently distributed legal opinion of a member of the Nebraska staff, do not properly reflect the wording of the compact or reasonable hydrologic and engineering principles. Pope stated that pumping of wells which are hydraulically connected to the surface waters of the Republican River and its tributaries are the activities of man and should be counted somehow in the calculation of virgin water supply. Kansas desires to resolve this matter through the Compact Commission and still considers it a serious matter. Commissioner Danielson stated for the record that the 3 commissioners had a telephone conference during which Nebraska indicated they were preparing a report on the subject which was apparently not yet complete. Due to the absence of Commissioner Jess, Commissioners Danielson and Pope agreed that further discussion on the issue would not be appropriate until Commissioner Jess had a full opportunity to present his information. Commissioner Danielson noted this issue had been unresolved for three years and urged Nebraska to attempt to come to a resolution on the matter and offered the possibility of a special meeting to deal with the subject. Commissioner Pope requested instead that the matter be dealt with at next year's meeting.

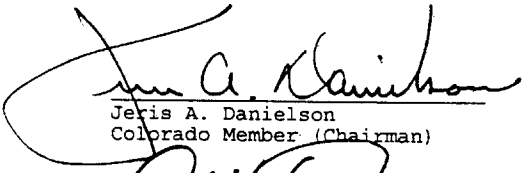
Recognizing that this more properly belongs under new business, it was moved and adopted that a resolution honoring Bob Bishop for his years of service to the commission be completed. Nebraska is to prepare the resolution and provide it to the chairman for signature and mailing.

New Business

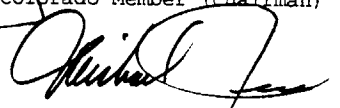
It was moved and seconded that the engineering committee be assigned their normal task of performing the standard computations. Commissioner Pope went on record as having objection to the methodology being used.

Commissioner Pope again expressed appreciation to Colorado for hosting this year's meeting in such a pleasant location.

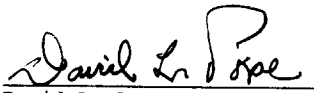
A tentative date for next years meeting was set for Friday, July 10, 1992. Upon motion and second, the meeting was adjourned.



Jeris A. Danielson
Colorado Member (Chairman)



J. Michael Jess
Nebraska Member



David L. Pope
Kansas Member

REPORT OF THE ENGINEERING COMMITTEE TO THE

REPUBLICAN RIVER COMPACT ADMINISTRATION

FOR THE 1990 WATER YEAR

The Engineering Committee met via a conference telephone call on May 13, 1991 to complete work assignments made by the Administration at the June 28, 1990 annual meeting. Those participating in the meeting were as follows:

Ann Bleed	Nebraska Department of Water Resources
Jerry Hilmes	Kansas Division of Water Resources
Hal Simpson	Colorado Division of Water Resources
Keith Vander Horst	Colorado Division of Water Resources

The Engineering Committee performed normal computations for Virgin Water Supply and Consumptive Use for the 1990 water year. The results of those computations are shown on Tables 1 and 2 attached to this report.

Computations were made using the computer program developed by the committee which utilizes the revised formulae published by the Administration in 1990. The data provided by each state for diversions of water in 1990 were reviewed, and the procedures for developing this data were discussed.

With respect to the reporting of use of ground water from alluvial aquifers, Colorado and Kansas use wells constructed into the alluvial aquifer. Nebraska is using a band with a width of one mile from either side of the stream. Ann Bleed indicated that Russ Oakland is reviewing geologic maps for delineation of the alluvial aquifers for Nebraska. Nebraska should be able to report ground water use in the same manner as Colorado and Kansas by the 1991 water year.

Ann Bleed indicated that Nebraska would like to review the computation of the record of flow for the Haigler Canal at the Nebraska-Colorado state line. Hal Simpson said Russ Oakland should contact Alan Berryman in the Greeley, Colorado, office.

Precipitation and runoff were below average throughout most of the basin resulting in reductions in allocations except in those basins where the extensive use of ground water caused the virgin water supply to actually increase over that originally allocated by the compact. As shown in Table 1, eight of the thirteen subbasins had the allocations of consumptive use reduced below the original compact allocation. Three subbasins had the allocation of consumptive use increase, and two subbasins did not change.

As shown in Table 2, Colorado exceeded its allocation of consumptive use in one basin, Kansas exceeded its allocation in two basins, and Nebraska exceeded its allocation in seven basins.

In accordance with the commitee's policy, the Chairman of the committee for 1991 and 1992 will be from Colorado following the rotation of the Compact Administration.

The next meeting will be held in May of 1992 unless special assignments by the Compact Administration require additional meetings.

Ann Bleed, Nebraska

Gerald Hilmes, Kansas

Harold Simpson, Colorado

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Table 1 1990 Computed Annual Virgin Water Supply and Original and Annual Adjusted Allocations

Sub-basin and the Original Compact Virgin Water Supply	Computed Annual Virgin Water Supply Republican River Basin 1990 (Acre Feet)			Comparison of Original Compact Allocations and 1990 Adjusted Allocation (Acre Feet)							
				Colorado		Kansas		Nebraska		Total Basin	
	Ground Water	Surface Water	Total Basin	Compact Alloc.	Adj. Alloc.	Compact Alloc.	Adj. Alloc.	Compact Alloc.	Adj. Alloc.	Compact Alloc.	Adj. Alloc.
Prairie Dog Cr. 27600	16860	3590	20450			12600	9340	2100	1560	14700	10900
Sappa Cr. 21400	24510	2710	27220			8800	11190	8800	11190	17600	22380
Beaver Cr. 16500	19810	240	20050	3300	4010	6400	7780	6700	8140	16400	19930
Medicine Cr. 50800	13790	31800	45590					4600	4130	4600	4130
Red Willow Cr. 21900	6760	13748	20508					4200	4200	4200	4200
Driftwood Cr. 7300	1860	1740	3600			500	250	1200	590	1700	840
Frenchman Rv. 98500	46800	48450	95250					52800	52800	52800	52800
South Fork of the Republican Rv. 57200	17280	17260	34540	25400	15340	23000	13890	800	480	49200	29710
Rock Cr. 11000	100	7680	7780					4400	3110	4400	3110
Buffalo Cr. 7890	530	4160	4690					2600	1540	2600	1540
Arikaree Rv. 19610	6060	4880	10940	15400	8590	1000	560	3300	1840	19700	10990
N.F. Republican Rv in Colorado 44700	610	34020	34630	10000	7750			11000	8520	21000	16270
N.F. and Main Stem of Republican Rv. incl. Blackwood Cr. in Nebraska* 94500	81200	113750	194950			138000	175130	132000	168268	270000	343398
TOTALS 478900	236170	284028	520198	54100	35690	190300	218140	234500	266368	478900	520198

Table 2 1990 Computed Consumptive Use within the Republican River Basin (Acre Feet)

Sub-basin	Colorado Ground Water	Colorado Surface Water	Colorado Total	Kansas Ground Water	Kansas Surface Water	Kansas Total	Nebraska Ground Water	Nebraska Surface Water	Nebraska Total	Total Basin Ground Water	Total Basin Surface Water	Total Basin Total
Prairie Dog Cr.				16860	4660	21520 9340 *	1010	210	1220 1560 *	17870	4870	22740 10900
Beppe Cr.				8860	170	9030 11190 *	16590	1200	17790 11190 *	25450	1370	26820 22380
Beaver Cr.	0	0	0 4010 *	9360	60	9420 7780 *	10450	0	10450 8140 *	19810	60	19870 19930
Medicine Cr.							14550	1160	15710 4130 *	14550	1160	15710 4130
Red Willow Cr.							6760	1340	8100 4200 *	6760	1340	8100 4200
Driftwood Cr.				0	0	0 250 *	1860	0	1860 590 *	1860	0	1860 840
Frenchman Rv.							46800	15780	62580 52800 *	46800	15780	62580 52800
South Fork of the Republican Rv.	7510	8540	16050 15340 *	9770	160	9930 13890 *	0	0	0 480 *	17280	8700	25980 29710
Rock Cr.							100	0	100 3110 *	100	0	100 3110
Buffalo Cr.							530	900	1430 1540 *	530	900	1430 1540
Arikaree Rv.	5180	0	5180 8390 *	130	0	130 560 *	750	0	758 1848 *	6060	0	6060 10990
N.F. Republican Rv in Colorado	610	3040	3650 7750 *				0	3130	3130 8520 *	610	6170	6780 16270
N.F. and Main Stem of Republican Rv. incl. Blackwood Cr. in Nebraska*				160	55720	55880 175130 *	78330	97620	175956 168268 *	78490	153340	231830 343398
TOTALS	13300	11580	24880 35690 *	45140	60770	105910 218140 *	177730	121340	299070 266368 *	236170	193690	429860 520198

(* indicates adjusted allocations from Table 1)