

OFFICIAL OFFICE



SECOND ANNUAL REPORT

Republican River  
Compact  
Administration

For the Year 1961



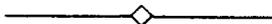
LINCOLN, NEBRASKA

March 23, 1962

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Second Annual Report of  
REPUBLICAN RIVER COMPACT ADMINISTRATION

For the Period January 1, 1961 to March 23, 1962

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

1. Provisions of Administration's Rules and Regulations for Annual Report

Rule No. 12 of the Rules and Regulations, as amended at the annual meeting on March 23, 1962, provides that "The Administration at each annual meeting shall adopt and enter upon its records a report covering a summary of its transactions and proceedings for the preceding year, the current status of its affairs and including such other matters as may be deemed appropriate by the official members. Copies of the report may be furnished to the President of the United States; the Governors of the States of Colorado, Nebraska and Kansas; officials of State and Federal Agencies and others as determined by the Administration."

Pursuant to amended Rule 12, this report covers the period from January 1, 1961 to March 23, 1962.

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, as follows:

J. E. Whitten, State Engineer of Colorado  
R. V. Smrha, Chief Engineer, Division of Water  
Resources, State Board of Agriculture, Kansas  
Dan S. Jones, Jr., Director, Department of Water  
Resources, Nebraska

3. The Second Annual Meeting was held on April 4, 1961, and the Third Annual Meeting was held on March 23, 1962, in the Capitol Building, Lincoln, Nebraska. Copies of the minutes of these meetings are included elsewhere in this report.

4. Two meetings of the Committee on Procedure for Computation of Annual Virgin Water Supply were held during the year and the

Committee presented progress reports at the Second and Third Annual Meetings. A copy of the 1961 Progress Report is a part of the First Annual Report of the Administration. A copy of the Committee's 1962 Progress Report together with a summary tabulation of the computations of the virgin flows for the 1959, 1960 and 1961 water years is included herein.

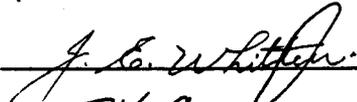
5. During the period covered by this report, Mr. F. F. LeFever, District Engineer, U. S. Geological Survey, Lincoln, Nebraska, conducted an Investigation of Feasibility of a Pilot Study of Return Flow in the Republican Basin in Nebraska following a request made by the Administration at the Second Annual Meeting. A progress report on the subject was presented at the Third Annual Meeting in which it was stated that the reach between Trenton, on the Republican, and Palisade, on the Frenchman, down to Cambridge appears to have some potential as a return flow study reach. The Administration accepted the report and requested that the Geological Survey continue its investigations looking toward the submitting of a program for a return flow study to be initiated as soon as financing can be arranged.

6. Prior to adjournment on March 23, 1962, R. V. Smrha, Kansas Member of the Administration, was elected to serve as Chairman until the next Annual Meeting.

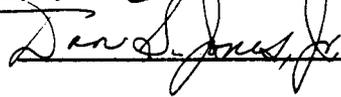
Respectfully submitted,

REPUBLICAN RIVER COMPACT ADMINISTRATION

By:

  
\_\_\_\_\_  
Colorado Member

  
\_\_\_\_\_  
Kansas Member

  
\_\_\_\_\_  
(Chairman)  
Nebraska Member

Minutes of The  
Third Annual Meeting  
of The  
Republican River Compact Administration  
Lincoln, Nebraska -- March 23, 1962

The meeting was called to order by the Chairman, Dan S. Jones, Jr., at 9:00 o'clock A.M., in the Lawyer's Room, 2122 Capitol Building, Lincoln, Nebraska.

Mr. L. T. Burgess was seated as the personal representative of Mr. J. E. Whitten, Colorado member of the Administration, upon the presentation of a letter dated March 13, 1962, from Mr. Whitten to the Chairman, duly appointing Mr. Burgess in accordance with the rules and regulations of the Administration. A copy of said letter, designated Exhibit "A", is attached and made a part hereof.

The following were in attendance:

R. V. Smrha, Official Member, Topeka, Kansas  
Dan S. Jones, Jr., Official Member, Lincoln, Nebraska  
L. T. Burgess, Personal Representative of J. E. Whitten, Official Member, Denver, Colorado  
Chas. F. Keech, District Engineer, U. S. Geological Survey (G. W.), Lincoln, Nebraska  
H. D. Brice, Ass't. Dist. Engineer, U. S. Geological Survey (S. W.), Lincoln, Nebraska  
Earl C. Meserve, Corps of Engineers, Kansas City, Mo.  
H. L. Mackey, Kansas Division of Water Resources, Topeka, Kansas  
M. E. Ball, Ass't. Director, Nebraska Department of Water Resources, Lincoln, Nebraska  
H. E. Engstrom, U. S. Department of Agriculture, Lincoln, Nebraska

The minutes of the Second Annual Meeting, which were previously approved by correspondence, were read.

Report of Chairman:

The Chairman of the Administration reported as follows:

- (a) There were no meetings of the Administration held since the Second Annual Meeting on April 4, 1961.
- (b) The Chairman had printed 100 copies of the First Annual Report and had furnished copies to each of the other members for distribution in their states. The Chairman distributed copies within his state and to Federal representatives at the regional and national levels.

Reports of Official Members or Representatives:

None.

Unfinished Business:

The Chairman of the Committee on Procedure for Computation of Annual Virgin Water Supply, Mr. M. E. Ball, presented a progress report for the Committee. A copy of the Progress Report with a summary tabulation of the results of the computations of the virgin flows in the 1959, 1960 and 1961 water years for each of the streams from which allocations were made in the compact is attached as Exhibit "B" and made a part of these minutes. On motion by Mr. Smrha, the report of committee was received and the committee was commended for its accomplishments.

Mr. Herman Brice presented for F. F. LeFever, District Engineer, Lincoln District, U. S. Geological Survey, a written Progress Report on Investigation of Feasibility of Pilot Study of Return Flow in Republican Basin in Nebraska, which was made pursuant to the request of the Compact Administration. The report relates particularly to the reach between Trenton, on the Republican and Palisade, on the Frenchman downstream to Cambridge on the Republican, and concludes that this reach appears to have some potential as a return flow pilot study reach. A copy of Mr. LeFever's report is appended hereto as Exhibit "C". The Administration accepted the report and requested that the return flow studies be continued.

Mr. H. E. Engstrom, U. S. Department of Agriculture, reported on the Agricultural Research Service study to determine the effect on run-off of land treatment and watershed projects.

Mr. Earl C. Meserve, U. S. Army Corps of Engineers, called attention to discrepancies in drainage areas in the Republican River Basin being used by the various interested agencies. He suggested that immediate steps be taken by appropriate agencies to resolve such discrepancies.

New Business:

On motion of Mr. Smrha, the Administration assigned the Committee on Procedure for Computation of Annual Virgin Water Supply to make virgin flow studies for 1962 and to make computations of consumptive uses within each of the sub-basins for 1961 and 1962.

\* Exhibit "C" is not included by agreement of the official representatives. This report is on file in the Nebraska Department of Water Resources.

New Business: (cont.)

Upon motion duly made and seconded, the Administration voted to amend the first sentence of Rule 12 of the Rules and Regulations of the Administration by striking the word "calendar" in the third line thereof so that said sentence as amended reads as follows:

"The Administration at each annual meeting shall adopt and enter upon its records a report covering a summary of its transactions and proceedings for the preceding year, the current status of its affairs and including such other matters as may be deemed appropriate by the official members."

Mr. Smrha was elected Chairman of the Administration to serve until the next annual meeting.

Adjournment:

There being no further business to come before the Administration, the meeting adjourned at 11:45 A. M.

  
Dan S. Jones, Jr.  
Chairman

J. E. WHITTEN  
State Engineer

A. RALPH OWENS  
Deputy

STEVE McNICHOLS, Governor



L. T. BURGESS  
Chief Hydrographer  
HARRY L. SITTSER, Jr.  
Office Engineer

OFFICE OF THE STATE ENGINEER  
232 STATE SERVICES BUILDING  
1525 SHERMAN STREET  
DENVER 3, COLORADO  
March 13, 1962

Exhibit "A"

Mr. Dan S. Jones, Chairman  
Republican River Compact Commission  
Department of Water Resources  
Lincoln 9, Nebraska

Dear Mr. Jones:

I am sorry that I will be unable to attend  
the meeting of the Republican River Compact Commission  
to be held in Lincoln, Nebraska, on March 23, 1962.

In view of this situation, I do hereby appoint  
and designate Mr. L. T. Burgess as my Proxy to act, speak,  
and vote in my behalf on any and all matters which may  
come before the Commission at this meeting.

Very truly yours,

*J. E. Whitten*  
J. E. Whitten  
State Engineer

/L

Exhibit "B"

Progress Report  
Of the Committee on Procedure for Computation  
Of Annual Virgin Water Supply  
To the Republican River Compact Administration  
Dated March 23, 1962

Pursuant to instructions from the Republican River Compact Administration given to the subject committee at the 1961 annual meeting of the Administration, the committee is presenting herewith a summary of the "Computed Annual Virgin Water Supply-Republican River Basin, for the Water Years 1959, 1960, and 1961." The detailed computations are not presented as a part of this report but they are included with the minutes of the sixth meeting of the committee, copies of which are furnished to each state.

The committee met on two occasions during the past year with the fifth meeting of the committee held on January 16-18, 1962, and the sixth meeting held March 22, 1962.

The minutes of the two meetings are not at this time in a form suitable for presentation to the Administration at this meeting. Therefore, this report will contain a part of the information which will be included in those minutes. This is being done so that the decisions of the committee may be discussed

at this meeting if so desired.

The committee has proceeded to improve its methods of obtaining data for use in the formulas for the computation of virgin water supply. The following steps were taken by the committee to improve its methods of establishing factors for determining the virgin water supply and return flows for the various streams.

On the question of the elimination of the flows of Frenchman River crossing the Colorado-Nebraska state line, it was agreed that any flows that do cross the state line and finally appear at the mouth of the Frenchman River will be treated as flows of Frenchman River originating in Nebraska.

Relative to the question of the inclusion of the flow of the North Fork of the Republican River in Nebraska, it was agreed that as far as the virgin water supply computations are concerned, such flows at present would be appropriately included with the flow of the main stem of the Republican River. If adjusted allocations are made as provided by the Compact, the question will need to be resolved as to whether these flows will be included with the main stem of the Republican River. The compact allocations to Kansas do not include the water from the North Fork of the Republican River.

Relative to the question of the Haigler Canal, Colorado has not determined the acreage under the Haigler Canal irrigated by wells, but plans have been made for investigation in 1962.

Nothing further has been done toward the establishment of gaging stations on the canal. Colorado presented data on the headgate diversions as follows:

<u>Year</u>	<u>Acre-feet</u>
1959	18,870
1960	16,920
1961	14,160

While these diversions were based on spot readings or measurements, these quantities were used in diversion water supply formulas for lack of better information. The diversions between Colorado and Nebraska were divided on the basis of the estimated acreage in each state--1720 acres in Colorado and 5000 acres in Nebraska.

Based on information obtained from Elwin Krous, hydrologist for the Kansas River Projects, the committee has changed its method of computing the return flow from the canals constructed by the Bureau of Reclamation. The committee has before it "Monthly Water Distribution Reports" for the years 1959, 1960, and 1961. On these forms are shown for each canal, the diversions, main canal wastes and losses, deliveries to laterals, lateral wastes and losses, and farm deliveries. The present Bureau practice, which was adopted by the Virgin Flow Committee, is to compute return flow as 75 per cent (net supply minus farm deliveries) plus 75 per cent (farm deliveries multiplied by farm loss in per cent). While estimated farm losses or efficiencies might change from year to year there were no changes recommended for 1959, 1960, and 1961. The latest farm losses as per cent of

farm deliveries were as follows for the major canal diversions:

Frenchman-Cambridge Division	
All canals	30%
Bostwick Division	
Franklin Canal	35%
Naponee Canal	35%
Franklin Pump Canal	35%
Superior Canal	31%
Courtland Canal	23%

During 1961 Nebraska made an effort to improve the determination of diversion by stream pumps on Medicine Creek, Frenchman River and Red Willow Creek. The 1960 and 1961 diversions for these streams were based on data obtained in 1961. The committee agreed that for the main stem of the Republican River and for the other streams in Nebraska to base the diversion by small canals and stream pumps on the data obtained in Kansas. The Kansas data was also used to reflect the factors used by ground water pumping in Nebraska. The diversion rate of 1.6 acre-feet per acre was used in 1959, 1.5 acre-feet per acre for 1960, and 1.4 acre-feet per acre for 1961. The diversion rates for small stream pumps for the main stem of the Republican River for 1959, 1960, and 1961 was 1.1 acre-feet per acre.

Pursuant also to a request made by the Administration to the U. S. Geological Survey for continued studies concerning the return flow in the Republican River Basin, Herman Brice will be here today to present a report prepared by Floyd LeFever concerning this subject.

The virgin water supply studies presented for 1959-1961 do not permit a quick conclusion as to the water consumed in each state. The consumptive use in each state could be computed for the data presented. It would be necessary, however, to further compute the consumptive use of water in Kansas which crosses the state line in the Courtland Canal, which is not reflected in the records at Hardy. These computations have not been made; therefore, it is not possible at this time to compute the total consumptive use of water by Kansas.

Respectfully submitted,  
Chairman of the Committee

*M. E. Ball*

Computed Annual Virgin Water Supply  
Republican River Basin

March 23, 1962

Drainage Basin	Compact Ac. Ft.	1959 W.Y. Ac. Ft.	1960 W.Y. Ac. Ft.	1961 W.Y. Ac. Ft.
Prairie Dog Creek	27,600	15,040	41,860	30,740
Sappa Creek	21,400	18,700	51,970	31,040
Beaver Creek	16,500	16,640	50,970	21,840
Medicine Creek	50,800	45,520	80,440	42,620
Red Willow Creek	21,900	27,230	47,610	27,230
Driftwood Creek	7,300	2,610	16,500	560
Frenchman Creek	98,500	116,550	151,450	103,770
South Fork of the Republican River	57,200	43,330	44,650	36,470
Rock Creek	11,000	10,970	10,540	10,090
Buffalo Creek	7,890	6,060	6,540	5,920
Arikaree River	19,610	10,800	24,480	10,120
North Fork of the Republican River	44,700	56,140	52,450	53,590
Main Stem of the Republican plus Blackwood Creek	*94,500	142,700	322,330	176,760
Totals	478,900	515,290	901,790	550,750
*Main Stem Blackwood Creek	87,700 6,800			