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ALLOCATIONS UNDER REPUBLICAN RIVER COMPACT OF 1942

Acre-feet

Stream	Total Average Annual flow assumed in compact	Amount Allocated			Total
		Colorado	Nebraska	Kansas	
N. Fk. Republican R.	44,700	10,000	11,000		21,000
Arikaree R.	19,610	15,400	3,300	1,000	19,700
Buffalo Cr.	7,890		2,600		2,600
Rock Cr.	11,000		4,400		4,400
S. Fk. Republican R.	57,200	25,400	800	23,000	49,200
Frenchman Cr.	98,500 ^{a/}	All in Colo.	52,800		52,800
Red Willow Cr. (Colo.) ^{b/}	—	All in Colo.			—
Rep. R. & Trib. at Colo-Nebr. St. Line ^{c/}	87,700				
Blackwood Cr.	6,800				
Driftwood Cr.	7,300		1,200	500	1,700
Red Willow Cr. (Nebr.) ^{d/}	21,900		4,200		4,200
Medicine Cr.	50,800		4,600		4,600
Beaver Cr.	16,500	3,300	6,700	6,400	16,400
Sappa Cr.	21,400		8,800	8,800	17,600
Prairie Dog Cr.	27,600		2,100	12,600	14,700
Rep. R. at Nebr.-Kans. ^{e/} St. Line				138,000	138,000
Additional ^{f/}			132,000		132,000
Total	478,900	54,100	234,500	190,300	478,900

^{a/} Frenchman Creek (River) drainage basin in Nebraska.

^{b/} Red Willow Creek drainage basin in Colorado.

^{c/} N. Fork of Republican River in Nebraska and main stem of the Republican River between the junction of the North Fork and the Arikaree River and the lowest crossing of the River of the Nebraska-Kansas State Line and the small tributaries thereof.

^{d/} Red Willow Creek drainage basin in Nebraska.

^{e/} From the main stem of the Republican River upstream from the lowest crossing of the river at the Nebraska-Kansas State Line and from water supplies of upstream basins otherwise unallocated. Kansas shall have the right to divert all or any portion thereof at or near Guide Rock, Nebraska. In addition the entire water supply originating in the Basin downstream from this point is allocated to Kansas.

^{f/} From the N. Fork of the Republican River in Nebraska, the main stem of the Republican River between the junction of the North Fork and Arikaree River and the lowest crossing of the river at the Nebraska-Kansas State Line, from the small tributaries thereof, and from water supplies of upstream basins otherwise unallocated herein.

NOTE: Should the future computed virgin water supply of any source vary more than 10 percent from the virgin water supply herein set forth, the allocations hereinafter made from such source shall be increased or decreased in the relative proportions that the future computed virgin water supply of such source bears to the computed virgin water supply used herein. Such action requires unanimous action of officials representing the three states.

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Table - Acres served in Republican Drainage

Division and Reservoir	Colorado	Kansas	Nebraska	Total
Per Republican Division				
Wray Reservoir	650	0	4,430	5,080
Bonny Reservoir	5,200	1,800	0	7,000
Rock Creek Reservoir	0	0	5,000	5,000
Richman-Cambridge Division				
Enders Reservoir	0	0	22,910	22,910
Trenton Reservoir	0	0	16,440	16,440
Red Willow Reservoir	0	0	12,590	12,590
Medicine Creek Reservoir	0	0	20,150	20,150
Nebraska Division				
Beaver City Reservoir	0	0	1,200	1,200
Oberlin Reservoir	0	1,500	0	1,500
Norton Reservoir	0	5,000	0	5,000
Stwick Division				
Harlan County Reservoir				
Franklin Unit	0	0	15,850	15,850
Red Cloud Unit	0	0	1,480	1,480
Superior Unit	0	0	7,400	7,400
Courtland Unit	0	41,150	3,560	44,710
Republic Unit	0	9,150	0	9,150
Scandia Unit	0	12,700	0	12,700
Lovewell Unit	0	8,000	0	8,000
Total	5,850	71,300 a/	110,740	188,160 a/

a/ Excludes 8,000 acres irrigated by supplemental water supply of Lovewell Reservoir.

Table 15.—Reservoir Storage Capacity

Reservoir	Storage in Acre-Feet				Total	Canal Outlet Elev.	Elevation at top of Irrigation Pool
	Conservation or Dead at End of First 50 Years	50-Years Sediment	Active Irrig. at End of First 50 Years	Flood Control			
Wray	0	500	8,000	1,000	9,500	3,605.0	3,645.2
Bonny	1,000	9,000	33,000	132,000	175,000	3,635.5	3,671.8
Rock Creek	0	500	10,000	0	10,500	3,131.5	3,182.2
Trenton	0	64,000	58,800	133,800	256,600	2,710.0	2,752.0
Enders	5,000	10,000	29,000	30,000	74,000	3,080.0	3,112.3
Red Willow	0	8,400	18,000	22,000	48,400	2,522.0	2,569.8
Medicine Creek	800	15,000	24,200	53,000	93,000	2,335.0	2,366.1
Beaver City	0	9,000	11,700	20,000	40,700	2,190.0	2,212.0
Oberlin	0	8,000	14,800	20,000	42,800	2,580.0	2,605.2
Norton	0	9,000	20,000	20,000	49,000	2,280.0	2,303.9
Harlan County	75,000	100,000	175,000	500,000	850,000	1,920.0	1,942.5
Lovewell	3,500	5,000	28,000	17,000	53,500	1,562.0	1,580.0

HARLAN COUNTY RESERVOIR
Sediment Production From Intermediate Area

Total area controlled above proposed dams:

Trenton	-	7,816	sq.	mi.
Enders	-	2,240	-	-
Medicine	-	838	-	-
Norton	-	693	-	-
Oberlin	-	<u>1,024</u>	-	-
		11,611	sq.	mi.
Harlan	-	<u>20,753</u>	sq.	mi.
Difference		9,142	sq.	mi.

Effective drainage area:

4,910	sq.	mi.
820	-	-
680	-	-
693	-	-
<u>1,024</u>	-	-
8,127	sq.	mi.
<u>15,100</u>	sq.	mi.
7,000	sq.	mi.

Rate of Sedimentation $\frac{100,000}{50 \times 9,142} = .219 \text{ AF/sq. mi./yr.}$

$\frac{100,000}{50 \times 7,000} = .286 \text{ AF/sq. mi./yr.}$

This data supplied by Sam Jones in 1948

REPUBLICAN RIVER BASIN

Comparison of Water Supply of
Drainage Basins as listed in
Article III of Compact with
that of the 6-year period, 1941-46

<u>Drainage Basin</u>	<u>Water Supply (Acres Feet)</u>		1941-1946 our figures
	<u>COMPACT</u>	<u>1941-46</u>	
North Fork of Republican River in Colorado	44,700	45,880	55,375
Arikaree River	19,610	20,450	18,236
Buffalo Creek	7,890	7,920	6,577
Rock Creek	11,000	10,600	10,199
South Fork, Republican	77,200	72,240	56,882
Frenchman Creek (Nebraska)	98,500	100,590	65,605
Blackwood Creek	6,800	No Record	
Driftwood Creek	7,300	No Record	9,210
Red Willow Creek	21,900	30,710	29,910
Medicine Creek	50,800	69,070	66,280
Beaver Creek	16,500	26,300	
Sappa Creek	22,400	39,950	41,740
Prairie Dog Creek	27,600	No Record	42,300
Main Stem and Small Tributaries (not included above) in Nebraska:			
State Line to Culbertson		(a) 24,600	
Culbertson to Bloomington		(b) 121,120	
Bloomington to Hardy		(c) 102,650	
Sub total (a, b, and c.)	<u>87,700</u>	<u>248,430</u>	
<u>Total</u>	<u>478,900</u>	<u>* 713,840</u>	

*Includes values in "compact" column for Blackwood, Driftwood and Prairie Dog Creeks.

The values in column headed "1941-1946" are derived by adding the "present use" figures in the attached compilation to the recorded flows for the various drainage basins, records of actual consumptive use not being available.

Following is a comparison of the "long-time" mean with the 1941-1946 mean for certain Republican River Stations:

(Continued to next page)

<u>Stream</u>	<u>Long-time Mean</u>	<u>1941-46 Mean</u>	<u>Per Cent</u>
North Fork Republican	35,420	35,375	100
Arikaree	16,340	18,240	112
South Fork Republican	45,450	57,140	126
Frenchman, Gilbertson	89,520	85,590	96
Republican, Gilbertson	126,670	150,760	120
Medicine Creek	54,200	68,570	126
Republican, Bloomington	461,440	576,400	125
Republican, Hardy	559,200	679,000	121

June 11, 1947

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