

No. 126, Original

In the
SUPREME COURT OF THE UNITED STATES

STATE OF KANSAS,
Plaintiff

v.

STATE OF NEBRASKA and
STATE OF COLORADO,
Defendants.

Before Special Master William J. Kayatta, Jr.

Pumping Reduction Impacts for 2005-2006

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Introduction

As part of the broader analysis of economic damages due to Nebraska's failure to comply with the Final Settlement Stipulation's water-short year test for 2006, we were asked to compute the impacts of a remedy scenario.

Method of Analysis

Under this scenario, groundwater pumping for irrigation for the years 2005 and 2006 was removed within model cells identified as Nebraska's Rapid Response Region (10% - 2 year response corridor) in the Republican River basin in Nebraska, excluding such cells in the Tri-Basin NRD. Figure 1 shows the affected cells in red. The 10% - 2 year response corridor was defined by Nebraska as those cells in which at least ten percent of pumping is supplied by stream depletion within two years. These computations were made using the RRCA groundwater model. In performing these computations, all other conditions in the model for the years 2005 and 2006 were the same as those in the RRCA historical model runs for these years. In particular, groundwater irrigation area outside the stream cells remained the same as was reported for years 2005 and 2006.

Results of this analysis are compiled on Tables 1, 2 and 3 below. As Table 1 shows, this scenario reduced groundwater irrigation pumping by an average of 99,294 acre-feet and groundwater irrigated area by average of 109,660 acres from the corresponding historical values for 2005 and 2006. Nebraska's impact—i.e., the net difference of Nebraska pumping impacts and Platte River import credits— is reduced by a total of 42,522 acre-feet for the two years under the reduced pumping conditions. Note that both groundwater irrigation pumping and irrigated area are different in 2005 versus 2006.

Table 1: Reduction in groundwater irrigation and pumping, and corresponding reduction of Nebraska impact on Republican River stream flow, under the remedy scenario.

Year	Groundwater irrigation pumping reduction (acre-feet)	Groundwater irrigation area reduction (acres)	Nebraska impact reduction, pumping - import credit (acre-feet)
2005	111,313	115,440	15,462
2006	87,276	103,881	27,060
2005-2006	Average: 99,294	Average: 109,660	Sum: 42,522

Table 2: Impact reductions by accounting point for 2005 and 2006.

Account point	Year			
	2005	2006	Average 2005- 2006	Sum 2005- 2006
Arikaree	72	73	73	145
Beaver	0	0	0	0
Buffalo	75	175	125	250
Driftwood	35	85	60	120
Frenchman	5,842	6,095	5,968	11,937
North Fork	2	3	2	5
Above Swanson	2,737	3,370	3,053	6,107
Swanson - Harlan	-4,106	6,149	1,023	2,043
Harlan - Guide Rock	6,741	5,592	6,167	12,333
Guide Rock - Hardy	1,350	1,233	1,292	2,583
Medicine	1,981	3,127	2,553	5,108
Prairie Dog	0	0	0	0
Red Willow	74	222	148	296
Rock	0	1	0	1
Sappa	0	0	0	0
South Fork	112	401	256	513
Hugh Butler	106	71	88	177
Bonny	0	0	0	0
Keith Sebelius	0	0	0	0
Enders	186	278	232	464
Harlan	99	58	78	157
Harry Strunk	24	3	13	27
Swanson	122	125	123	247
Mainstem Total	6,727	16,344	11,536	23,071
Total	15,462	27,060	21,261	42,522

Table 3: Nebraska pumping impact and Imported Water Supply credit by accounting point for 2005 and 2006. (a) historical conditions, (b) pumping removed within the 10% - 2 year response corridor; and (c) change in pumping impact and IWS credit due to pumping reductions.

Scenario (a, b):		a. Historical conditions				b. No pumping in 10-2 corridor				c. Change in pumping impact and IWS credit due to pumping reductions			
Location		Pumping		IWS Credit		Pumping		IWS Credit		Pumping		IWS Credit	
		2005	2006	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006
Arikaree		250	125	0	0	178	52	0	0	-72	-73	0	0
Beaver		2,684	3,517	0	0	2,684	3,517	0	0	0	0	0	0
Buffalo		3,357	3,335	0	0	3,282	3,160	0	0	-75	-175	0	0
Driftwood		1,481	1,422	0	0	1,446	1,337	0	0	-35	-85	0	0
Frenchman		78,069	73,700	0	0	72,227	67,605	0	0	-5,842	-6,095	0	0
North Fork		836	866	0	0	834	863	0	0	-2	-3	0	0
Above Swanson		11,599	9,434	0	0	8,862	6,064	0	0	-2,737	-3,370	0	0
Swanson - Harlan		39,772	37,580	2,061	2,536	44,695	37,476	2,878	8,581	4,923	-104	817	6,045
Harlan - Guide Rock		28,360	26,022	220	237	21,627	20,430	228	237	-6,733	-5,592	8	0
Guide Rock - Hardy		3,654	3,054	0	0	2,304	1,821	0	0	-1,350	-1,233	0	0
Medicine		20,414	19,564	9,633	9,398	18,689	16,710	9,889	9,671	-1,725	-2,854	256	273
Prairie Dog		0	0	0	0	0	0	0	0	0	0	0	0
Red Willow		6,596	6,099	35	25	6,522	5,878	35	26	-74	-221	0	1
Rock		3,744	3,845	0	0	3,744	3,844	0	0	0	-1	0	0
Sappa		702	1,028	0	0	702	1,028	0	0	0	0	0	0
South Fork		1,372	1,040	0	0	1,260	639	0	0	-112	-401	0	0
Hugh Butler		1,709	1,647	0	0	1,603	1,576	0	0	-106	-71	0	0
Bonny		0	0	0	0	0	0	0	0	0	0	0	0
Keith Sebelius		0	0	0	0	0	0	0	0	0	0	0	0
Enders		4,650	4,624	0	0	4,464	4,346	0	0	-186	-278	0	0
Harlan		857	810	17	18	757	751	16	17	-100	-59	-1	-1
Harry Strunk		352	326	0	0	328	323	0	0	-24	-3	0	0
Swanson		421	374	0	0	299	249	0	0	-122	-125	0	0
Mainstem		83,385	76,090	2,274	2,768	77,487	65,791	3,103	8,813	-5,898	-10,299	829	6,045
Total		210,881	198,411	11,966	12,218	196,506	177,668	13,053	18,535	-14,375	-20,743	1,087	6,317

Figure 1: Map of model grid cells associated with Nebraska's the 10% - 2 year response corridor, excluding Tri-Basin NRD.

