

Attachment 3: RRCA groundwater model analysis
Reduction in Nebraska impacts under a scenario for 2005-2006

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As part of an 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 develop a groundwater model scenario for years 2005-2006 that removes groundwater pumping for irrigation within the model stream cells in the Republican River basin in Nebraska for these two years. All other conditions were the same as in the RRCA historical model runs for these years. In particular, the groundwater irrigation area outside the stream cells remains the same as reported for years 2005 and 2006.

As Table 1 shows, this scenario reduced groundwater irrigation pumping by an average of 116,505 acre-feet and groundwater irrigated area by 131,095 acres for years 2005 and 2006. Nebraska’s impact—i.e., the net sum of Nebraska pumping impacts and Platte River import credits—is reduced by a total of 41,175 acre-feet from the actual reported impacts for those two years. Note that both groundwater irrigation pumping and the irrigated area differ between 2005 and 2006, because the amount of irrigation reported by Nebraska and included in the RRCA historic model runs for those two years was different, and all of it in the model stream cells was removed for this model simulation.

Table 2 shows impact reductions at each accounting point for years 2005 and 2006, and shows both averages and sums of impact reductions over years 2005 and 2006.

Table 1. Reduction in groundwater irrigation and pumping, and corresponding reduction of Nebraska impact on Republican River streamflow, under the scenario simulated.

Year	Groundwater irrigation pumping reduction (acre-feet)	Groundwater irrigation area reduction (acres)	Nebraska impact reduction, pumping + mound (acre-feet)
2005	134,105	140,858	14,885
2006	98,905	121,332	26,290
2005-2006 Average:	116,505	131,095	Sum: 41,175

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

Year	2005	2006	Average 2005- 2006	Sum 2005- 2006
Account point				
Arikaree	73	73	73	146
Beaver	0	0	0	0
Buffalo	74	173	124	247
Driftwood	99	234	166	333
Frenchman	5686	5674	5679	11360
North Fork	131	44	87	175
Above Swanson	2533	3088	2811	5621
Swanson - Harlan	-3771	7819	2024	4048
Harlan - Guide Rock	6845	5445	6144	12290
Guide Rock - Hardy	1045	995	1021	2040
Medicine	1597	2012	1805	3609
Prairie Dog	0	0	0	0
Red Willow	41	103	72	144
Rock	1	6	3	7
Sappa	0	0	0	0
South Fork	109	379	244	488
Hugh Butler	82	3	43	85
Bonny	0	0	0	0
Keith Sebelius	0	0	0	0
Enders	101	82	92	183
Harlan	96	52	73	148
Harry Strunk	27	11	19	38
Swanson	109	99	104	208
Mainstem Total	6656	17346	12000	24002
Total	14885	26290	20587	41175