

7-1596B (9-89)
Bureau of Reclamation



United States Department of the Interior

BUREAU OF RECLAMATION
Great Plains Region
Nebraska-Kansas Area Office
P.O. Box 1607
Grand Island, Nebraska 68802-1607

IN REPLY REFER TO:

NK-100
WTR-4.11 *ref*

APR 07 2005

Lower Republican Natural Resources District
PO Box 618
Alma, NE 68920

Subject: Written Testimony, Lower Republican Natural Resources District (LRNRD) Public Hearing

Dear Sir:

Enclosed is the written testimony of the Bureau of Reclamation, Nebraska-Kansas Area Office submitted for the public hearing records as conducted by the LRNRD regarding the adoption of Ground Water Management Rules and Regulations and Integrated Management Plan (draft dated March 10, 2005), for the LRNRD.

Thank you for the opportunity to provide testimony and comments to your proposed rules and regulations. If you have any questions, please contact me at the above address or telephone 308-389-4622, extension 202.

Sincerely,

ALICE E. JOHNS

Alice E. Johns
Area Manager

Enclosure

cc: Roger Patterson, Director
Nebraska Department of Natural Resources
P.O. Box 94676
Lincoln, NE 68509-4676

Kenneth Nelson, Chairman
Irrigation Project Reauthorization Council
P.O. Box 165
Courtland, KS 66939-0165

OFFICIAL FILE COPY		
DATE	SURNAME	CODE
4/7	<i>AD</i>	<i>Alice</i>
Classification		
Project		
Control No.		
Folder I.D.		

Q2
3

Lee Orton, Attorney at Law
1233 Lincoln Mall, Suite 201
Lincoln, NE 68508

Mike Delka, Manager
Bostwick Irrigation District in Nebraska
P.O. Box 446
Red Cloud, NE 68970-0446

Roy Patterson, Superintendent
Frenchman-Cambridge Irrigation District
P.O. Box 116
Cambridge, NE 69022

Don Felker, Manager
Frenchman-Valley and H&RW Irrigation Districts
P.O. Box 297
Culbertson, NE 69024
(all w/enclosure)

bc: GP-1000 (Jaralyn Beek)
GP-4500 (Gordon Aycock)
GP-1270 (Donna Hirning)
NK-100 (O'Sullivan)
NK-300 (Kube)
NK-400 (Swanda)
(all w/enclosure)

WBR:AEJohns:treichert:4/6/05:308-389-4622
Written Testimony - LRNRD WTR-4.11

**Testimony of Alice E. Johns
Area Manager**

**Regarding the Lower Republican Natural Resources District Ground Water
Management Rules and Regulations and Integrated Management Plan Draft dated
March 10, 2005**

April 7, 2005

History

The devastating effects of a severe drought (Dust Bowl Years) in much of the western United States during the 1930s, and the Great Depression, were major contributors to the states' strong interest in seeking Federally-assisted water development in the Basin. In 1935, right in the midst of this extreme drought, the Republican River went on a rampage causing extreme flood damage as well as significant loss of life, and increasing the devastation to the economies within the Basin. The Flood of 1935 was the worst flood of record in the Basin. Rains as much as 18-24 inches fell in a short time in the upper Basin in eastern Colorado and runoff from these rainfall events combined with large inflows from tributaries along the way caused flooding throughout the Basin. These events and attendant impacts underlined the need to seek Federal assistance in the development of both water supply and flood control projects in the Basin.

Compact

Although the United States was not one of the original parties to the Republican River Compact (Compact), Reclamation was actively involved in the negotiating process. While Reclamation and the Corps of Engineers (Corps) were initially investigating water projects in the Republican River Basin, Reclamation requested that Kansas, Nebraska, and Colorado negotiate a compact allocating water equitably between the states. During the initial investigation of the Basin, Reclamation stated in a 1940 Reconnaissance Report on the Republican River Basin (Project Investigations Report No. 41): "To avoid expensive litigation as a result of possible conflicting uses of water in the various states, further developments for irrigation should be preceded by a three-state compact or similar agreement on use of water." The negotiations for this compact were entered into by the three states and the Compact was signed by the states and the representative of the United States on December 31, 1942. Ratification of the Compact by the States and the U.S. Congress followed in 1943. Reclamation assisted in the Compact negotiations by preparing hydrology investigations for the Basin. Reclamation anticipated that the individual states would protect the water rights associated with the Federal projects.

Project Development

Once the Compact was finalized, the resulting water allocations laid the framework for planning and designing a system of reservoir and irrigation projects that could assist each of the states in developing their allocated share of the Republican River. Between the late 1940s and 1960s nine Federal dams and reservoirs were constructed in the Republican River Basin (Basin), seven of these were Reclamation projects and two were Corps projects. Six irrigation projects were also developed and irrigation districts were organized and formed to manage each of these projects. Each of these irrigation districts presently receive irrigation water from one or more of the Federal reservoirs in the Basin. The total project acreage served by these Federal projects is approximately 137,000 acres. The City of Norton, Kansas also receives municipal and industrial water from Keith Sebelius Lake, a Reclamation reservoir in Kansas. These reservoirs also provide significant recreation, fish and wildlife, and flood control benefits to the area. The projects that were constructed are now an integral part of the river system and the allocation of water for each state.

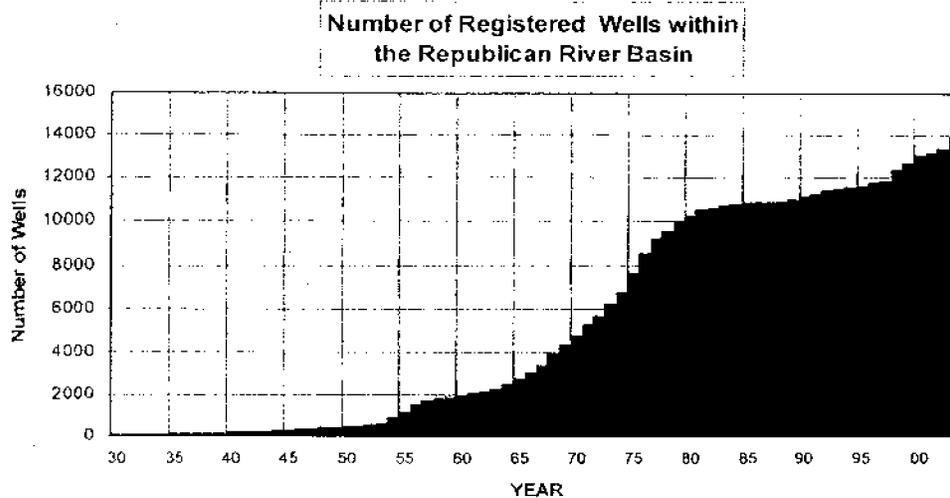
Cost of Projects and Repayment of Costs

Construction costs associated with the Republican River Basin Reclamation projects totaled more than \$233,000,000. Construction costs assigned to the irrigation function were over \$139,000,000. Irrigation districts are responsible for repaying a portion of the irrigation construction costs, based on the ability of each irrigation district to repay these costs. Irrigation construction costs not repaid by irrigation districts are repaid by users of Federal hydropower generated on the Missouri River. This is known as "aid-to-irrigation". Of the approximate \$139,000,000 irrigation construction costs, about \$39,000,000 will have been repaid by districts, leaving approximately \$100,000,000 to be repaid by Federal power users.

The remaining construction costs were assigned to purposes such as flood control, recreation and fish and wildlife. These costs are not repaid to the Treasury and thus are borne by the Federal taxpayers.

Well Development

An increase in groundwater wells in the Basin, for irrigation development, became particularly evident around 1960. Between 1960 and 1980 over 8,000 new irrigation wells were developed within 12 miles of a major stream in the Republican River Basin above Hardy, Nebraska. This time frame corresponds closely with a noticeable decline in river flows throughout the Basin. Base flow of many of these streams also declined providing a strong indication that there is a significant aquifer-streamflow interaction. These wells are likely intercepting groundwater that formerly discharged into the stream or they may be reversing the gradients to the streams, thereby inducing streamflow into the aquifer. The following graph shows the increase in the number of registered wells in Nebraska over time.



Water Rights

The Bostwick Irrigation District in Nebraska, Kansas Bostwick Irrigation District No. 2 and Frenchman-Cambridge Irrigation District have natural flow rights with diversion points within the Lower Republican Natural Resource District(LRNRD). In Nebraska, Reclamation has the storage rights associated with the Federal reservoirs as well as the storage use rights to use the water to supplement each irrigation district's natural flow rights. The natural flow rights (larger rights) associated with the Federal projects in the LRNRD have priority dates that vary from 1946 through 1954 and numerous small rights have later priority dates. For example, Bostwick Irrigation District in Nebraska has natural flow water rights for several canals. Franklin Canal has rights prior to 1960 that total 85.96 cubic feet per second. Naponee Canal has rights prior to 1960 that total 12.38 cubic feet per second. The points of diversion for these two canals are at Harlan County Dam. Downstream from Harlan County Dam, the District has rights on Franklin Pump, Superior and Courtland Canals that total 71.12 cubic feet per second(priority dates prior to 1960). As part of the Republican River Compact Litigation Settlement agreement, Kansas Bostwick Irrigation District has a recognized priority date of February 26, 1948 for diversion of natural flows at Superior-Courtland Diversion Dam near Guide Rock and the State of Nebraska will protect storage water released from Harlan County Lake for delivery at Guide Rock. Frenchman-Cambridge Irrigation District holds natural flow water rights for Cambridge Canal totaling 150.19 cubic feet per second (priority prior to 1960). The point of diversion is Cambridge Diversion Dam located on the Republican River three miles east of Cambridge, Nebraska. The Nebraska storage rights for Federal projects in the Republican River Basin held by Reclamation vary in priority from 1946 through 1960. All of these dates are prior to the rapid increase in groundwater development.

Water Supply

Surface water flows in the Basin have declined significantly since the late 1960s. In 1995, with several irrigation district water service contracts expiring, Reclamation and the districts entered into a process for renewal of these contracts. Studies prepared for the contract renewal process suggest that current stream and river flows were only 45 percent of the flows that were available when the Federal projects were first planned. In 1996, as part of the contract renewal process, Reclamation completed a Resource Management Assessment (RMA) study. Based on the findings for the RMA, there were 1,888,252 acres of total irrigated land located in the Basin in 1992, with the vast majority served from groundwater pumping. The report indicates that from 1964 until 1992 irrigated land in the Basin increased from 507,931 acres to 1,888,252 acres. Over this time frame surface water yield in the Basin declined significantly. The combined inflows into all of the Federal reservoirs above Harlan County Lake, a Corps project near the Nebraska-Kansas state line, averaged only 309,400 acre-feet per year for the period, 1984-2003. By comparison, the Definite Plan Reports (DPR), prepared for project planning purposes in the 1950s, show that, based on the historic records through the early 1950s, inflows were expected to average 662,900 acre-feet per year.

In general, the inflows to all reservoirs that serve Reclamation projects have declined at a significant rate since the projects were first developed. The following table shows the average flows that were included in the DPRs compared to the actual flows experienced since 1984.

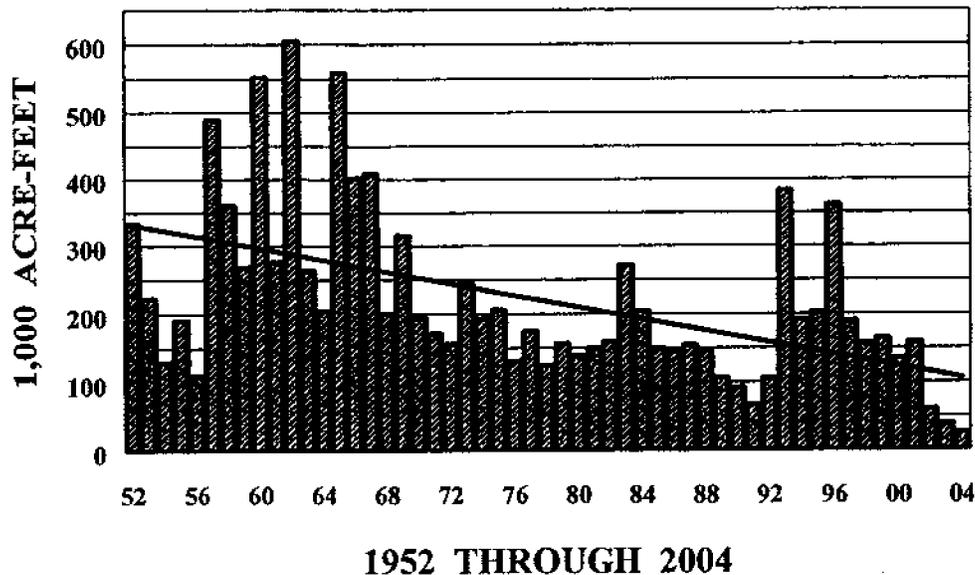
RESERVOIR	Inflow Comparisons in Acre-Feet			
	DPR AVERAGE	20 Yr. AVERAGE 1984-2003	5 Yr. AVERAGE 1999-2003	ACTUAL 2004
BONNY	30,800	14,500	9,900	5,400
SWANSON	115,300	51,500	27,500	12,700
ENDERS	55,100	18,400	10,900	4,900
HUGH BUTLER	19,300	16,200	12,900	9,600
HARRY STRUNK	56,800	39,400	34,700	28,700
KEITH SEBELIUS	26,600	9,000	8,100	3,700
HARLAN COUNTY	359,000	160,400	111,000	25,100
TOTALS	662,900	309,400	215,000	90,100
Percentage of DPR		47%	32%	14%

The only Federal reservoir located in the LRNRD is Harlan County Lake. For each of the last three years, Harlan County Lake's computed inflow has been a new record low. The 2004 inflow of 25,100 acre-feet for Harlan County Lake was 7% of the expected

DPR inflow. It can be noted from the table that the inflow declines for reservoirs in the Basin are significant. The table shows the 2004 inflows for the listed reservoirs are only 14% of the flows expected in the DPR.

The following graph shows the annual inflows for Harlan County Lake. The trend line on the graph indicates the inflows are continuing to decline.

HARLAN COUNTY DAM YEARLY HISTORICAL INFLOW



Federal Project Water Deliveries

Reduced surface water supplies have caused project water deliveries, throughout the Basin, to decline over the last 40 years. Irrigation districts have experienced a declining water supply which in turn has caused a number of impacts including shortening of the season that water can be delivered, changes in cropping patterns, and in some years a reduction in total acres irrigated. During water-short years, irrigators have also planted shorter season varieties of crops which have less yield potential which usually results in less farm income. The total acres with project water have essentially remained the same, while the amount of water diverted and delivered to each acre has declined. Activities in the LRNRD may directly impact the water supply associated with Federal projects.

Harlan County Lake storage and Republican River flows provide a project water supply for lands within Bostwick Irrigation District in Nebraska and lands within the Kansas Bostwick Irrigation District No. 2 above Lovewell Reservoir. These supplies, together with White Rock Creek flows and Lovewell Reservoir storage furnish a water supply for lands below Lovewell Reservoir. Due to reduced water supplies, the farm deliveries to project lands for 2003 and 2004 were significantly reduced. Farm deliveries to Nebraska lands averaged 6.36 inches in 2003 and 0.76 inches in 2004. It should be noted that the only canal that received water in 2004 was the Superior Canal and the water deliveries were all from natural flows as a limited amount of stored water was available. Farm deliveries to Kansas lands located above Lovewell Reservoir was 7.51 inches in 2003 and 0.13 inches in 2004.

Generally, the Definite Plan Reports for the projects estimated that approximately 18 inches of water delivered to the land would be necessary for full crop production. Due to the depletion of streamflow that has occurred since the projects were planned, water deliveries have fallen far below this level in recent years. Some of the impacts from this have been offset as irrigators have become more efficient in utilizing the water supply through improved technology and irrigation methods. Several districts have replaced some open-ditch laterals with pipe laterals, and Frenchman-Cambridge Irrigation District has replaced all of their open-ditch laterals with pipe. A number of irrigators are also converting to sprinkler irrigation systems in an effort to be more efficient.

Specific Comments on the Natural Resources District Ground Water Management Rules and Regulations and the Integrated Management Plan

Rule 6.7. WATER SHORT YEAR ADMINISTRATION

Article 6-7.1 Reclamation uses September 30th data for the calculation so it would be after October 1st before the calculation is furnished to the Nebraska Department of Natural Resources.

Article 6-7.3 and Article 6-7.4 Article language could be clarified.

Rule 7-2.4 SUPPLEMENTAL WELLS

General Comments

1. Individual surface water irrigators within each Reclamation project irrigation district pay annual water charges but do not control the timing or volume of irrigation releases.
2. Water is stored in Federal reservoirs for specific project purposes. In accordance with contractual provisions, Reclamation makes project water from Federal reservoirs available to the irrigation districts, and the irrigation districts pay a portion of the operation and maintenance costs associated with the reservoirs.

3. Forecasts of future water supplies are difficult since much of the runoff occurs as a result of storm events. Surface water supplies can fluctuate before and during irrigation season due to climatological events.
4. Who would be responsible for surface water forecasts to assist irrigators in projecting surface water supply?
5. Harlan County Lake is not a reservoir with carryover storage that would provide water for long periods of time. Typically Harlan County Lake does not have significant amounts of carryover storage since the irrigation supply in the reservoir is 130,000 acre-feet when the conservation pool is full. Irrigation releases could be expected to be approximately 100,000 acre-feet during dry years.
6. How would the surface water supply relate to the allocation for each allocation period?

SURFACE WATER CONTROLS – DEPARTMENT OF WATER RESOURCES

Paragraph 2. The 2nd sentence could be rewritten for clarification.

Conclusion and Final Statement

Depletions to stream flows have resulted in reduced storage in Federal reservoirs as well as less flow being available for direct flow diversions into the canals that are a part of the Federal projects. The reduced water deliveries have reduced the economic benefits provided by the projects. As a result, users of federal hydropower generated on the Missouri River will pay for a greater portion of the irrigation construction costs through "aid-to-irrigation". Other impacts associated with reduced streamflows include a reduction in reservoir levels in the Republican River Basin which reduces the recreational and fish and wildlife benefits associated with these projects.

I would like to note that the draft Integrated Management Plan states that "Pursuant to Neb. Rev. Stat. 46-715 (Reissue 2004), an integrated management plan must include clear goals and objectives with a purpose of sustaining balance between water uses and water supplies so that the economic viability, social and environmental health, safety, and welfare of the Republican River Basin can be achieved and maintained for both the near term and the long term". Sustained surface water inflows to the Federal reservoirs provide not only irrigation benefits, but also significant recreation and fish and wildlife benefits to the area. I would like to again note the water right priority dates associated with the Federal projects are prior to the dates that the majority of the groundwater development occurred. Therefore, in areas of groundwater-surface water interaction, I would request that specific consideration be given to surface water supplies for the Federal projects when establishing long-term and water-short year groundwater allocations.

