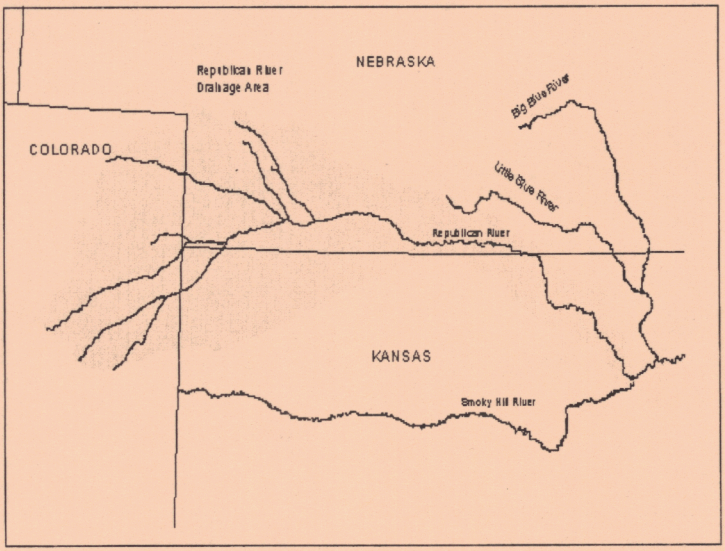
REPUBLICAN RIVER COMPACT ADMINISTRATION

FORTIETH ANNUAL REPORT

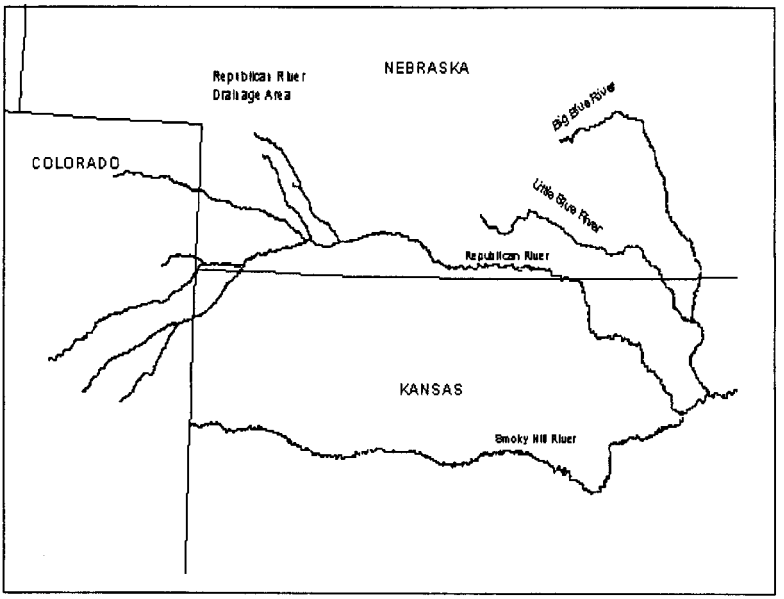


For The Year 1999

Topeka, Kansas
June 8, 2000

REPUBLICAN RIVER COMPACT ADMINISTRATION

FORTIETH ANNUAL REPORT



For The Year 1999

Topeka, Kansas
June 8, 2000

Table of Contents

ANNUAL REPORT
41st ANNUAL MEETING
REPUBLICAN RIVER COMPACT ADMINISTRATION

Minutes

A transcript of this meeting was prepared by a court reporter. It has been reviewed by each of the states and approved by the Compact Administration as the official minutes of the annual meeting of the Compact Administration. Copies of the transcript can be obtained from the offices of each of the Commissioners. Below is a brief summary of the meeting.

Introductions

The meeting was called to order by Chairman David L. Pope of Kansas at 9:00 a.m., June 8, 2000, at Ameri Suites Hotel, Sunflower Room, 6021 SW 6th Street, Topeka, Kansas.

Chairman Pope welcomed everyone in attendance. Chairman Pope of Kansas, Commissioner Hal D. Simpson of Colorado, and Commissioner Roger K. Patterson of Nebraska each introduced their staff and others in attendance. Those in attendance were:

Name	Representing
David L. Pope	Kansas Commissioner
Hal D. Simpson	Colorado Commissioner
Roger K. Patterson	Nebraska Commissioner
David W. Barfield	Kansas Department of Agriculture, Division of Water Resources
Lee E. Rolfs	Kansas Department of Agriculture
Scott E. Ross	Kansas Department of Agriculture, Division of Water Resources
John Cassidy	Kansas Attorney General Office
George A. Austin	Kansas Department of Agriculture, Division of Water Resources
Denise Rolfs	Kansas Department of Agriculture, Division of Water Resources
Dick Stenzel	Colorado Division of Water Resources
Ken Knox	Colorado Division of Water Resources
Ann Bleed	Nebraska Department of Water Resources
Russell Oaklund	Nebraska Department of Water Resources
Jeff Shafer	Nebraska Department of Water Resources
David Cookson	Nebraska Attorney General Office
Dave Eigenberg	Lower Republican Natural Resources District of Nebraska
Fred Ore	Bureau of Reclamation, Grand Island
Bill Peck	Bureau of Reclamation, McCook
Steve Ronshaugen	Bureau of Reclamation, Grand Island
Dennis Allacher	Bureau of Reclamation, McCook
Michael Bart	Corps of Engineers, Kansas City
Richard Oldham	Corps of Engineers, Kansas City
Glenn Engel	USGS, Nebraska District
Rep. JoAnn Freeborn	Kansas House of Representatives
Norman Nelson	Upper Republican Basin Advisory Committee, Norton, KS
Roy Patterson	Frenchman - Cambridge Irrigation District
Ralph Best	Frenchman - Cambridge Irrigation District
John Draper	Montgomery and Andrews, counsel for Kansas
Donna Ormerod	Montgomery and Andrews
Dale Book	Spronk Water Engineers, engineering consultant for Kansas
Don Blankenau	Kutak Rock, outside counsel for Nebraska
John Ourada	Natural Resources Conservation Service, Salina, KS

Approval of agenda

The Agenda was approved as proposed:

1. Introductions
2. Adoption of Agenda
3. Approval of Previous Annual Meeting Minutes
4. Report of Chairman (David Pope, Commissioner for Kansas)
5. Commissioners' Reports
   - Colorado
   - Nebraska
6. Federal Reports:
   - Bureau of Reclamation
   - Corps of Engineers
   - U.S. Geological Survey
7. Engineering Committee Report
8. Legal Committee Report
9. Old Business
10. New Business
11. Assignments to the Compact's Committees:
    - Engineering Committee
    - Legal Committee
12. Remarks from the Public
13. Future Meeting Arrangements
14. Adjournment

Approval of previous annual meeting minutes

After discussion and concurrence regarding the extent of changes to be made in the transcript of the meeting which serves as the annual meeting minutes, it was moved by Mr. Simpson, seconded by Mr. Patterson, and passed, that the minutes of the 40th Annual Meeting be approved as edited.

Approval of the 39th Annual Report

After discussion and concurrence regarding the extent of appendices and exhibits to be attached to the annual report, it was moved by Mr. Simpson, seconded by Mr. Patterson, and passed, that the 39th Annual Report be approved.

Report of Chairman

Chairman Pope provided an update of legislative activity reported at the previous annual meeting. Chairman Pope reported on the conversion of existing policies and standards into formal regulations. He reported on the process related to the rules and regulations of five groundwater management districts. Other items were the certification of existing water rights process and water quality issues including Governor Graves' initiative on the Lower Republican in connection with the establishment of TMDLs. Chairman Pope reported on the condition of stream flows in Northeast Kansas and the imminent administration of water rights in the lower Republican valley. Chairman Pope's report included an update on the status of interstate water litigation by John Draper in the U.S. Supreme Court to which Kansas is party, including the case of Kansas v. Colorado, No. 105 Original, regarding the Arkansas River Compact; and the case of Kansas v. Nebraska and Colorado, No.126 original, regarding the Republican River Compact.

Report of the Commissioner from Colorado

Commissioner Simpson reported that Colorado used or consumed 25,000 acre feet last year of the allocation of 54,100 acre feet. Colorado has restricted well use in the alluvium since 1970 and alluvium development has been limited for a number of years. Colorado appears to be in a state wide drought with 12 percent of long-term average snow pack. In the Republican River Basin the situation is dry with no soil moisture, below average precipitation and the content of Bonny Reservoir down. Commissioner Simpson's report included a discussion of the collection and monitoring of wells for quality issues, primarily nitrates, legislative activities and the status of the trial on No. 105 Original, Kansas v. Colorado.

Report of the Commissioner from Nebraska

Commissioner Patterson noted staff changes at the Department. Jim Cook will serve on the legal committee. He provided a brief report regarding actions by each of the Republican River basin Natural Resources Districts. Commissioner Patterson reported on the merger of the Natural Resources Commission and the Department of Water Resources into a new agency called the Department of Natural Resources. He reported on the status of the settlement discussion in Nebraska v. Wyoming, No. 108, Original and the drought condition in Nebraska. Russ Oaklund provided an overview of water administration in the Republican River basin in Nebraska in the1999 growing season.

Report by the Bureau of Reclamation, U.S. Department of Interior

Fred Ore provided an update on the Bureau's work with the irrigation districts of the Republican River basin on long-term contract renewal for irrigation water supplies. The execution of the contracts was expected by late in July. Mr. Ore reported on safety of dams work on reservoirs in the basin. Bill Peck provided a report on operations of the Bureau's projects in the Republican River basin this past year including a discussion on Functional and Table Top Exercises on Emergency Action Plans. Mr. Peck's report is attached as Exhibit 1.

Report by the U.S. Army, Corps of Engineers

Michael Bart reported on the Corps' work with the Bureau on irrigation water supply contract renewal, particularly as it relates to Harlan County dam; the Corps' continued evaluation of its tainter gates at Harlan County dam; and provided an update on the status on the development of a wetlands complex in the flood pool of Milford Reservoir.

Report by the U.S. Geological Survey

Glen Engel reported on the U.S. Geological Survey's cooperative stream gaging program in the basin and characterized streamflow in the basin in the past year as below the annual means or the period of record through out the basin. The lowest annual means for the period of record were recorded at two sites, Rock Creek at Parks and Republican River at Stratton. Mr. Engel's report is attached as Exhibit 2.

Engineering Committee Report

David Barfield of Kansas presented the Engineering Committee Report. The assignment made at the 1999 annual meeting included the review of potential hydrologic data for inclusion in the annual report, recommendations for such data, and examples for the compact year of 1999. The committee recommended publishing tables of monthly streamflow data, a bar graph of the last 10 years of annual discharge, bar graphs of ten years of annual precipitation totals as reported at reservoir sites. The reports of the U.S. Geological Survey on streamflows and the Bureau of Reclamation on reservoir operations provided to the engineering committee would also be published. Following a discussion of the content of the report, a motion to approve the report was made by Simpson, seconded by Patterson and passed. A copy of the engineering report is attached as Attachment 3.

Legal Committee Report

There was no report as the Legal Committee lacked an assignment. The committee membership was reported as changed since the previous year. Lee Rolfs of Kansas, Jim Cook of Nebraska and Wendy Weiss of Colorado were the designated members of the committee.

Old Business

Chairman Pope expressed concern based on compact history in regard to drought conditions existing in the basin. Chairman Pope then requested that: Nebraska curtail uses of water in excess of its allocations under the Compact, the appropriate officials curtail additional development of wells aggravating the situation in excess of the compact allocations, and sufficient water administration occur as needed to protect releases from Harlan County Reservoir for the Kansas Bostwick Irrigation District.

Commissioner Patterson responded that appropriate action would be taken.

New Business

No new business was reported.

Assignments to the Compact's Committees:

Engineering Committee

Ann Bleed presented to the Commissioners her understanding of the assignment to the engineering committee based on an earlier discussion during the Engineering Committee report. A motion was made by Patterson, seconded by Simpson and passed on the assignment as articulated by Ms. Bleed.

Legal Committee - No assignments were made to the Legal Committee.

Remarks from the Public

No remarks were received.

Future Meeting Arrangements

Roger Patterson was selected as the next chairman. Commissioner Patterson invited the Compact Commissioners to the next annual meeting in McCook, Nebraska. After discussion, the date was set for June 14, 2001. (Subsequent communication moved the date to June 7, 2001.)

Adjournment

The meeting was adjourned at 12:00 p.m., June 8, 2000.

David L. Pope
Kansas Commissioner (Chairman)

Roger K. Patterson
Nebraska Commissioner

Hal D. Simpson
Colorado Commissioner

Exhibits

Exhibit #1 - Bureau of Reclamation report
Exhibit #2 - U.S. Geological Survey report
Exhibit #3 - Engineering Committee report

BUREAU OF RECLAMATION

OPERATION

AND

MAINTENANCE

REPORT

REPUBLICAN RIVER

COMPACT MEETING

TOPEKA, KANSAS

JUNE 8. 2000

Exhibit #1

REPUBLICAN RIVER COMPACT MEETING
June 8, 2000
Topeka, Kansas

1999 Operations

As shown on the attached Table 1, the precipitation in the Republican River Basin varied from 69 percent of normal at Lovewell Reservoir to 126 percent of normal at Enders Reservoir. Bonny, Enders, Swanson, Harry Strunk, Keith Sebelius and Harlan County Lake received above normal precipitation. Total precipitation was below normal at the other reservoirs ranging from 14.80 inches at Bonny Reservoir to 19.29 inches at Lovewell Reservoir.

Inflows varied from 55 percent of the most probable forecast at Enders Reservoir to 228 percent of the most probable forecast at Keith Sebelius Lake. Inflows into Harlan County Lake were 164,141 AF and Lovewell Reservoir 44,757 AF. Inflows into Keith Sebelius were 10,498 AF which is overt two times the expected most probable amounts.

Average farm delivery values for each irrigated acre are as follows:

District	Farm Delivery
Frenchman Valley	7.1 inches
H&RW	4.7 inches
Frenchman-Cambridge	9.6 inches
Almena	5.0 inches
Bostwick in NE	11.2 inches
Kansas-Bostwick	13.8 inches

1999 Operation Notes

Bonny Reservoir--Started the year 4.9 feet below the top of conservation. The end of October elevation was the lowest since 1969. November computed inflow at Bonny Reservoir was the lowest recorded for the month since construction.

Enders Reservoir--normal operations.

Swanson, Hugh Butler, and Harry Strunk Lakes--Swanson and Hugh Butler started the irrigation season 7.1 feet and 3.0 feet below the top of conservation and Harry Strunk 2.1 feet into the flood pool.

Keith Sebelius Lake--The total inflow of 10,498 AF was between the normal and wet-year forecasts. The reservoir started the irrigation season 1.1 feet below the top of conservation.

Harlan County Lake--Last year's high elevation was El. 1948.12 which is 2.1 feet into the flood pool. The lake finished the season at elevation 1942.97 (3.0 feet below full). Inflow for the year was 164,141 AF.

Lovewell Reservoir--The precipitation for last year was 69% of normal which was the lowest since 1976. Last year's high elevation was El. 1585.88 which is 3.28 feet into the flood pool. The lake finished the year 7.3 feet below the top of active conservation mostly because of maintenance activities involving the removal of sediment accumulations in the spillway channel upstream of the dam.

Current Operations

Table 2 shows a summary of data for the first five months.

Bonny Reservoir--An Early Warning System (EWS) is operational and a Functional Exercise of the Emergency Action Plan (EAP) is planned for this year. Bonny is presently 3.9 feet from full.

Swanson Lake--Presently 9.1 feet from full. Irrigation releases have recently started from the lake.

Enders Reservoir--The reservoir is 13.6 feet from full. A Safety of Dams Modification was deemed necessary to control seepage and improve the level of safety of the dam. Drilling and installation of new instrumentation was completed in 1999. An evaluation of the instrumentation data will be done and modification alternatives will be determined. Construction could begin some time between the spring of 2001 and the spring of 2003.

Hugh Butler Lake--Presently 3.2 feet from full. Irrigation releases have begun from the lake. A Safety of Dams corrective action study has been initiated to deal with seepage concerns.

Harry Strunk Lake--Target elevation of 2 feet into the flood pool. Presently 1.0 feet into the flood pool. Irrigation release started in early May.

Keith Sebelius Lake--Presently 3.2 feet below full.

Harlan County Lake--Presently 1.2 feet into the flood pool. Irrigation releases began in late May.

Lovewell Reservoir--Presently .2 feet into the flood pool. Irrigation releases have begun in late May.

Other Items

Inspections

All of the dams will be inspected in 2000.

Emergency Management Operations

All of the NKAO dams now have an approved Emergency Action Plan (EAP) and a Tabletop Exercise has been conducted to test the plans. Annual Orientation Meetings will be held with the local Emergency Management personnel below Reclamation facilities to evaluate notification procedures. Radios to contact downstream 24-hr. warning points from the dams have been installed. They are to be tested on a monthly basis.

A Functional Exercise of the EAP for Bonny Dam will be conducted this year and a Tabletop Exercise of Webster Dam will also be conducted this year.

Water Availability

Full supplies are available for Frenchman-Cambridge, and the Bostwick Irrigation Districts. The Almena District will deliver at least 5 inches from an available 13-inch supply. H&RW and Frenchman Valley Districts are expected to deliver 4.0 inches.

Sedimentation

A sedimentation re-survey has been scheduled for Keith Sebelius Lake in 2000.

Water Conservation

Increased emphasis is being placed on water conservation by Reclamation. A full time employee is available in the Area Office to work with the irrigation districts on their water conservation efforts.

Security

The Department has placed a high priority on security of the numerous government facilities. We are presently conducting assessments and surveys of our facilities to determine what additional security measures are required. As a result of this there will likely be both structural and non-structural changes made at our facilities to ensure a proper level of security and safety.

Hydromet

Hydromet instrumentation continues to be installed on all the canal diversion points and at other key locations on the distribution systems. Several sites have equipment already installed and includes the state line measurement on the Courtland Canal, Culbertson, Cambridge, Bartley, Red Willow, and Almena Canals. The data that is collected is transmitted via satellite and will be available on Reclamation's Internet site. This allows the gathering of data from remote locations in a more timely manner.

Other Reservoirs

Kirwin Reservoir is 1.2 feet into the flood pool and Webster Reservoir is 2.2 feet into the flood pool. Cedar Bluff Reservoir is .5 feet into the flood pool.

TABLE 1
NEBRASKA-KANSAS PROJECTS
Summary of Precipitation, Reservoir Storage and Inflows

CALENDAR YEAR 1999

Reservoir	Total Precip. Inches	Percent Of Average %	Storage 12-31-98 AF	Storage 12-31-99 AF	Gain or Loss AF	Maximum Storage Content AF	Maximum Storage Date	Minimum Storage Content AF	Minimum Storage Date	Total Inflow AF	Percent Of Most Probable %
Box Butte	18.98	113	15,094	14,268	(826)	22,907	JUL 5	9,374	SEP 3	16,574	91
Merritt	19.19	96	69,668	69,110	(558)	74,781	APR 20	34,316	SEP 3	191,874	108
Sherman	23.15	102	52,478	52,241	(237)	70,518	JUN 27	40,724	SEP 5	90,976	82
Calamus	25.20	107	118,295	83,949	(34,346)	129,460	MAY 5	51,826	SEP 30	305,298	123
Davis Creek	27.01	117	6,817	20,132	13,315	27,095	JUL 13	6,424	APR 2	52,551	116
Bonny	14.80	86	32,095	31,423	(672)	37,713	JUN 14	31,044	NOV 22	15,222	90
Enders	23.67	126	20,076	19,106	(970)	24,234	JUN 28	14,275	AUG 18	16,766	55
Swanson	20.63	103	56,018	53,392	(2,626)	80,458	JUN 23	47,762	OCT 3	46,224	71
Hugh Butler	19.07	96	29,038	28,533	(505)	31,573	JUN 27	26,383	AUG 10	17,092	92
Harry Strunk	25.21	122	22,842	34,187	11,345	39,699	JUL 2	22,930	JAN 1	40,702	98
Keith Sebelius	25.98	106	30,782	28,234	(2,548)	33,507	JUN 22	27,886	NOV 5	10,498	228
Harlan County	24.74	109	269,947	292,312	22,365	344,176	JUN 21	270,179	JAN 1	164,141	119
Lovewell	19.29	69	30,861	17,807	(13,054)	46,277	JUN 7	13,775	SEP 4	44,757	64
Kirwin	23.96	102	90,727	94,346	3,619	105,575	JUN 14	90,678	JAN 4	41,937	250
Webster	29.58	125	67,653	75,781	8,128	85,763	JUL 2	67,688	JAN 1	35,344	281
Waconda	23.21	89	230,886	233,679	2,793	278,476	MAY 26	217,098	MAR 7	228,102	233
Cedar Bluff	24.36	117	185,022	181,748	(3,274)	188,610	APR 27	181,680	DEC 22	33,104	399

Exhibit #1

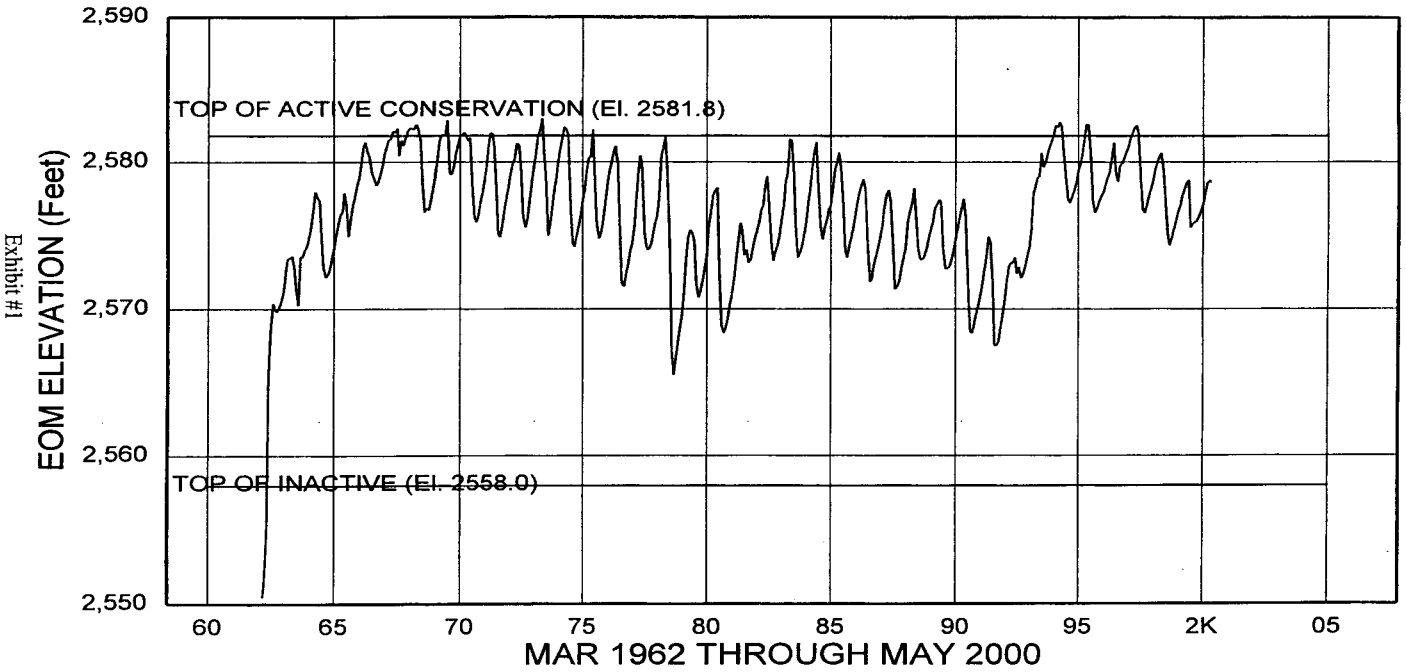
TABLE 2
NEBRASKA-KANSAS AREA OFFICE
Summary of Precipitation, Reservoir Storage and Inflows

JANUARY - MAY 2000

Reservoir	Precip. Inches	Percent Of Average %	Storage 05-31-99 AF	Storage 05-31-00 AF	Gain or Loss AF	Inflow AF	Percent Of Most Probable %
Bonny	6.75	103	34,504	33,887	(617)	6,800	69
Enders	4.72	67	23,454	23,825	371	6,300	51
Swanson	4.76	64	76,693	72,552	(4,141)	23,900	57
Hugh Butler	4.88	70	31,257	31,302	45	5,800	67
Harry Strunk	6.30	85	37,776	37,699	(77)	17,100	90
Keith Sebelius	6.43	71	33,049	29,472	(3,577)	4,000	174
Harlan County	8.69	109	331,229	333,007	1,778	74,300	95
Lovewell	5.46	57	45,722	37,117	(8,605)	23,900	88
Kirwin	8.53	96	104,198	104,567	369	15,800	166
Webster	9.92	112	81,775	85,117	3,342	19,100	233
Waconda	8.95	99	273,648	233,922	(39,726)	61,900	138
Cedar Bluff	10.34	142	185,918	189,030	3,112	16,600	395

HUGH BUTLER LAKE

END OF MONTH ELEVATION



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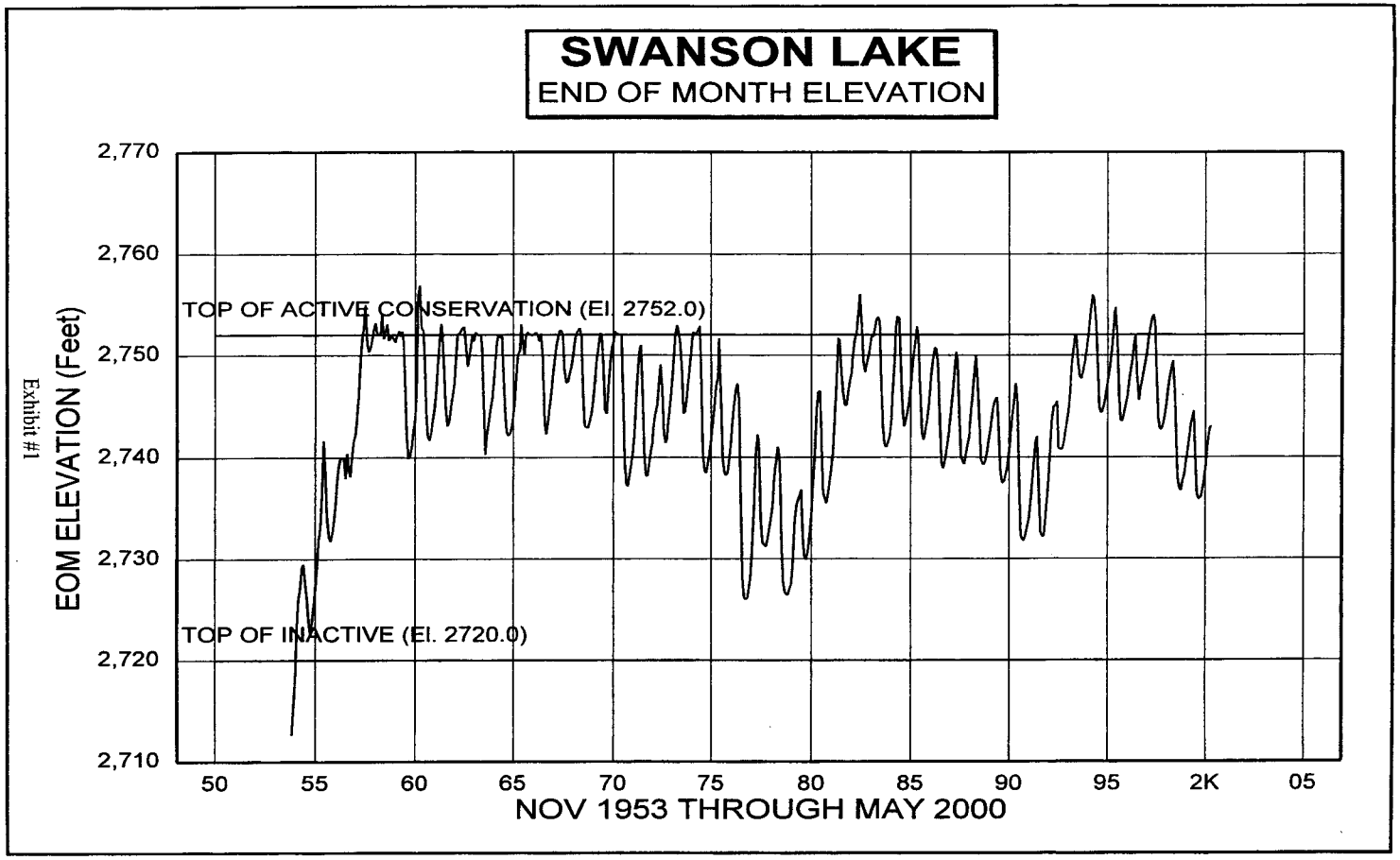

SWANSON LAKE
END OF MONTH ELEVATION
EOM ELEVATION (Feet)
2,770
2,760
2,750
2,740
2,730
2,720
2,710
TOP OF ACTIVE CONSERVATION (El. 2752.0)
TOP OF INACTIVE (El. 2720.0)
50
55
60
65
70
75
80
85
90
95
2K
05
NOV 1953 THROUGH MAY 2000

Exhibit #1

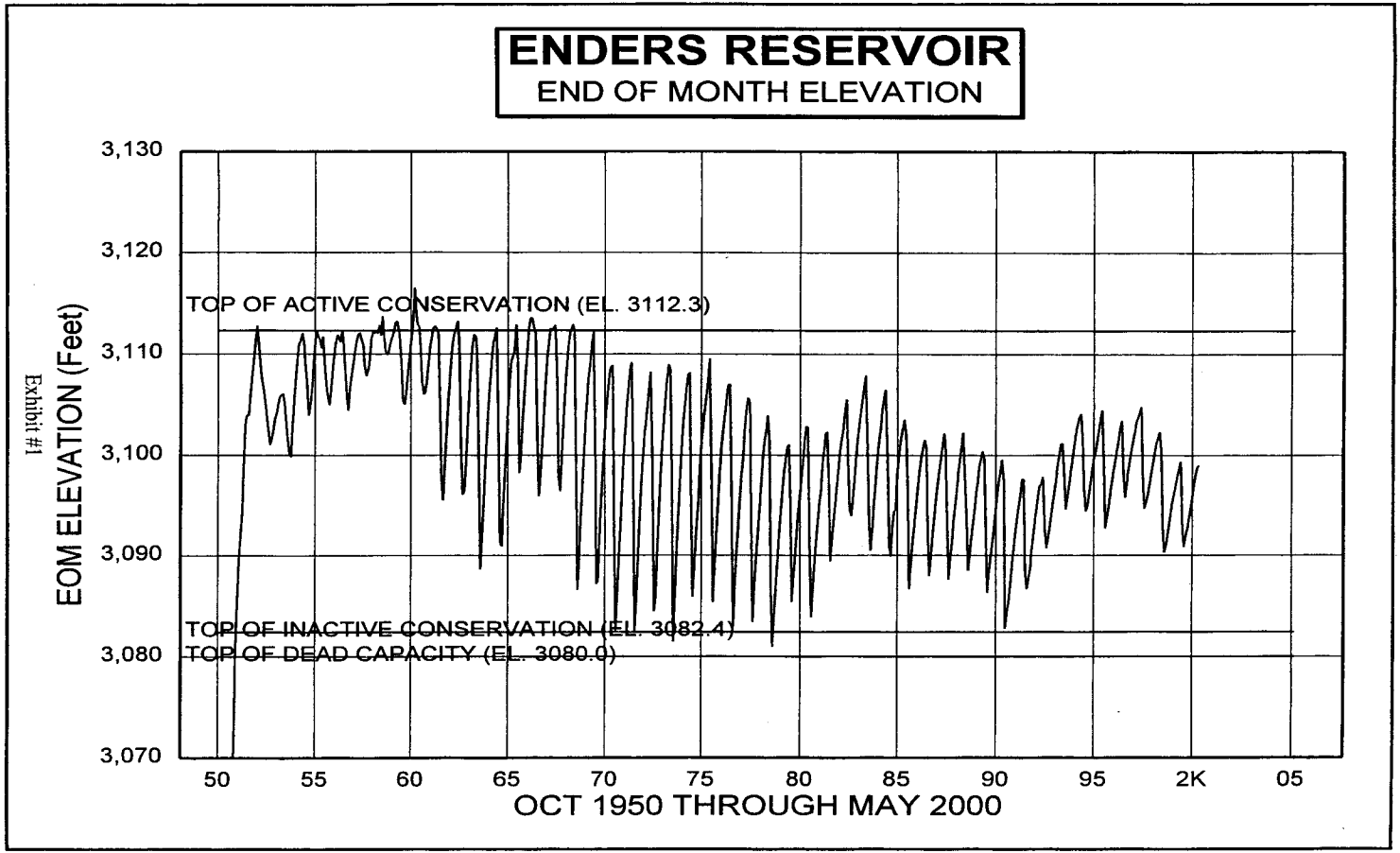

ENDERS RESERVOIR
END OF MONTH ELEVATION
EOM ELEVATION (Feet)
3,130
3,120
3,110
3,100
3,090
3,080
3,070
TOP OF ACTIVE CONSERVATION (EL. 3112.3)
TOP OF INACTIVE CONSERVATION (EL. 3082.4)
TOP OF DEAD CAPACITY (EL. 3080.0)
50
55
60
65
70
75
80
85
90
95
2K
05
OCT 1950 THROUGH MAY 2000

Exhibit #1

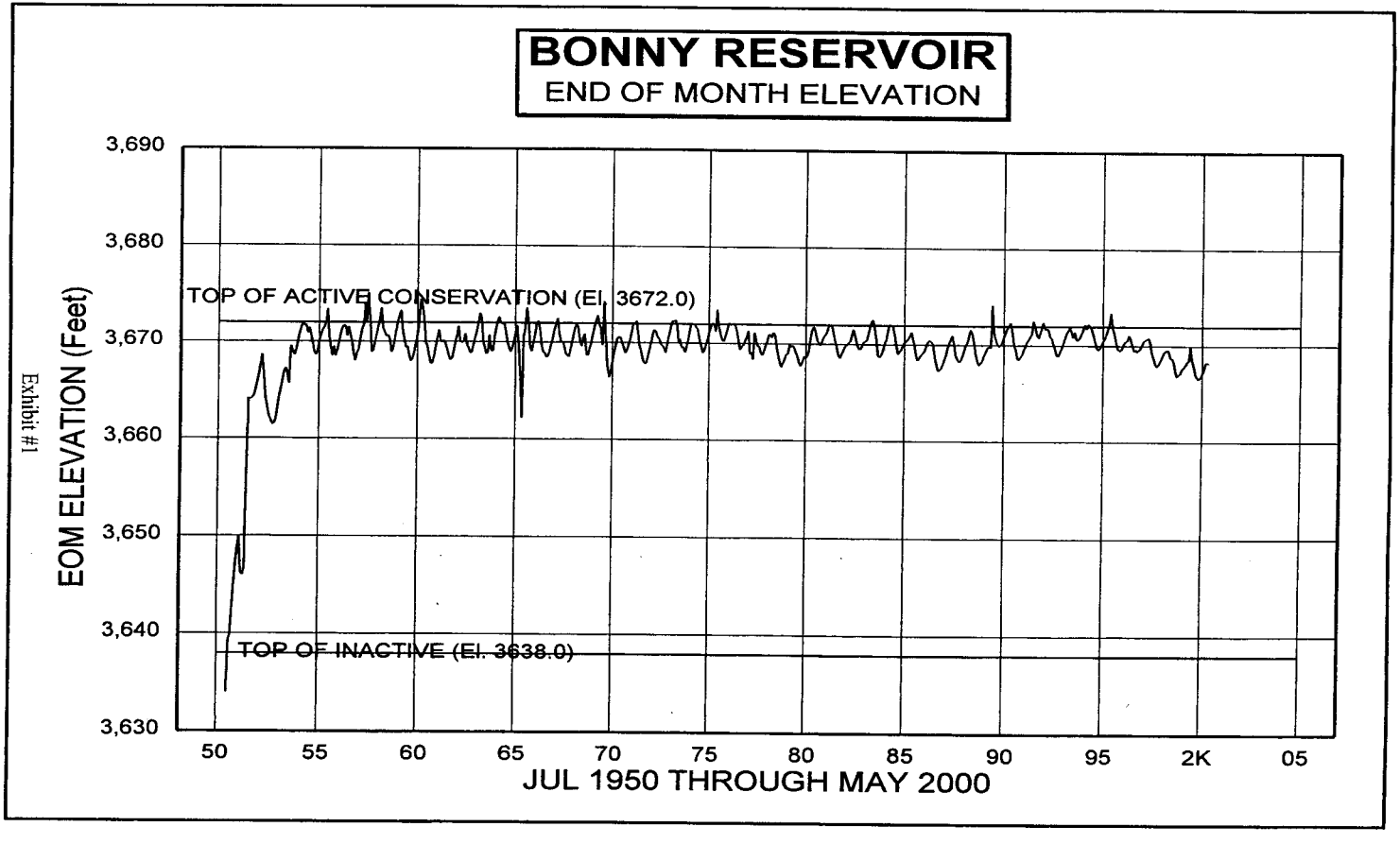
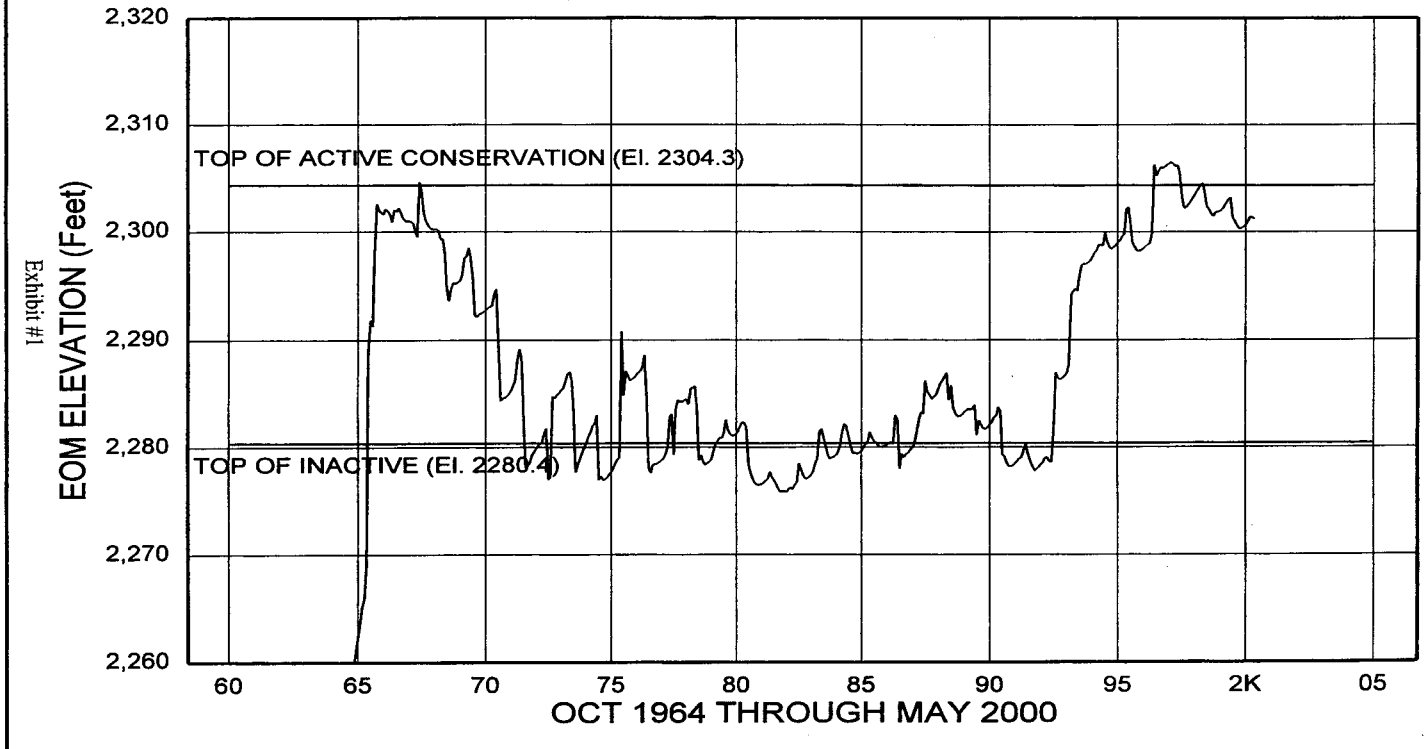

BONNY RESERVOIR
END OF MONTH ELEVATION
EOM ELEVATION (Feet)
3,690
3,680
3,670
3,660
3,650
3,640
3,630
TOP OF ACTIVE CONSERVATION (El. 3672.0)
TOP OF INACTIVE (El. 3638.0)
50
55
60
65
70
75
80
85
90
95
2K
05
JUL 1950 THROUGH MAY 2000

Exhibit #1

KEITH SEBELIUS LAKE

END OF MONTH ELEVATION



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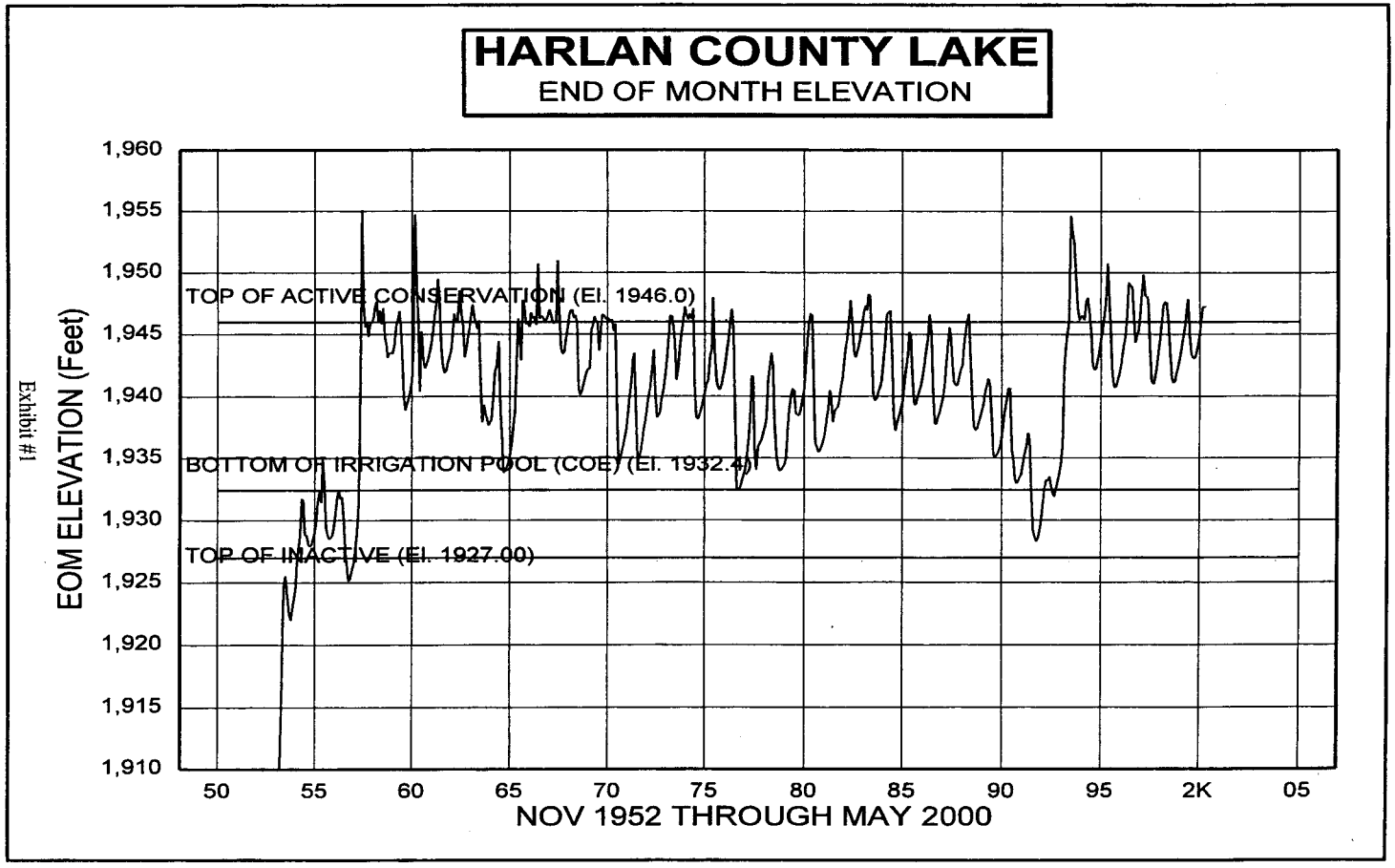
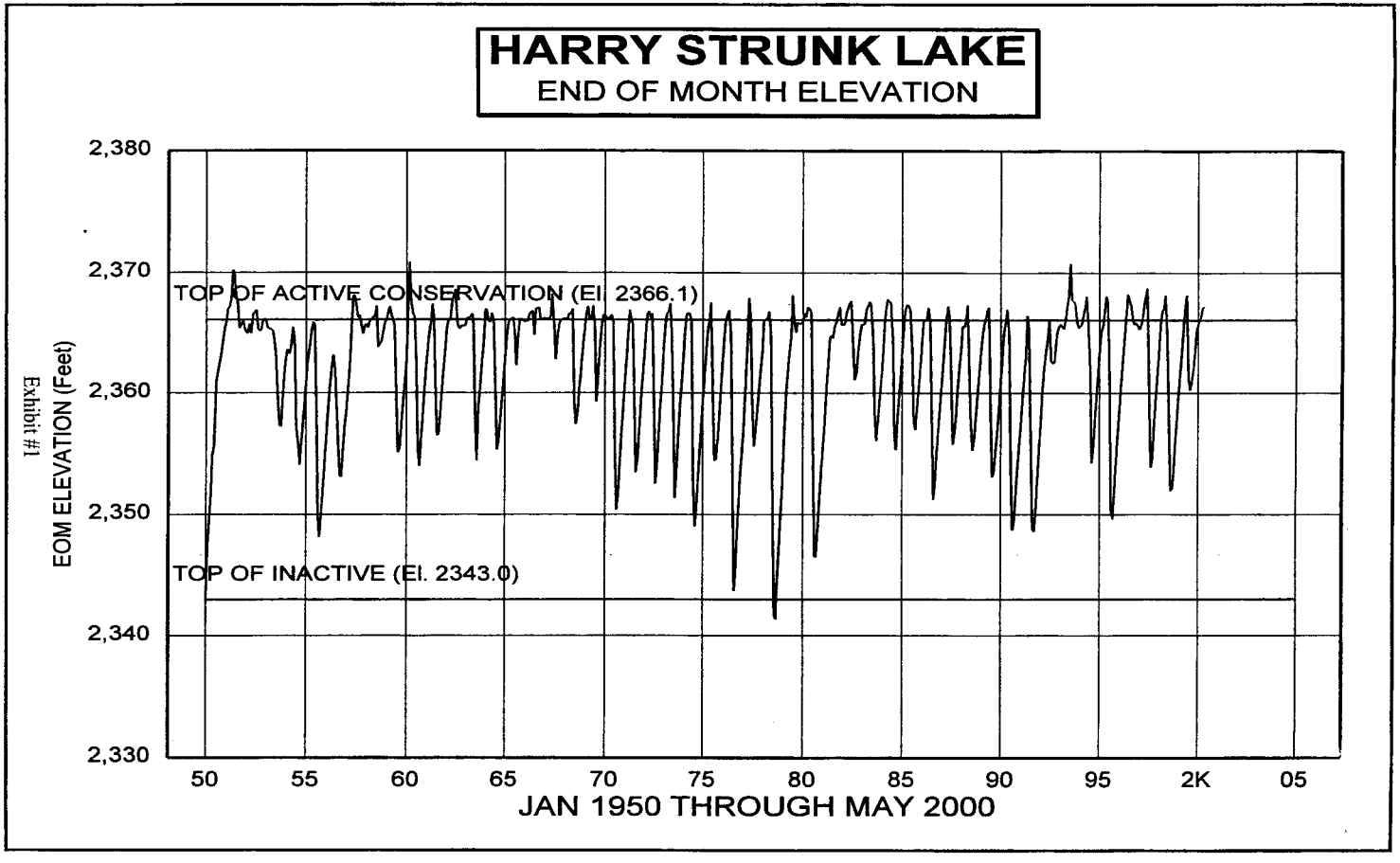

HARLAN COUNTY LAKE
END OF MONTH ELEVATION
EOM ELEVATION (Feet)
1,960
1,955
1,950
1,945
1,940
1,935
1,930
1,925
1,920
1,915
1,910
TOP OF ACTIVE CONSERVATION (El. 1946.0)
BOTTOM OF IRRIGATION POOL (COE) (El. 1932.4)
TOP OF INACTIVE (El. 1927.00)
50
55
60
65
70
75
80
85
90
95
2K
05
NOV 1952 THROUGH MAY 2000

Exhibit #1


HARRY STRUNK LAKE
END OF MONTH ELEVATION
Exhibit #1
EOM ELEVATION (Feet)
2,380
2,370
2,360
2,350
2,340
2,330
TOP OF ACTIVE CONSERVATION (El. 2366.1)
TOP OF INACTIVE (El. 2343.0)
50
55
60
65
70
75
80
85
90
95
2K
05
JAN 1950 THROUGH MAY 2000

LOVEWELL RESERVOIR
END OF MONTH ELEVATION

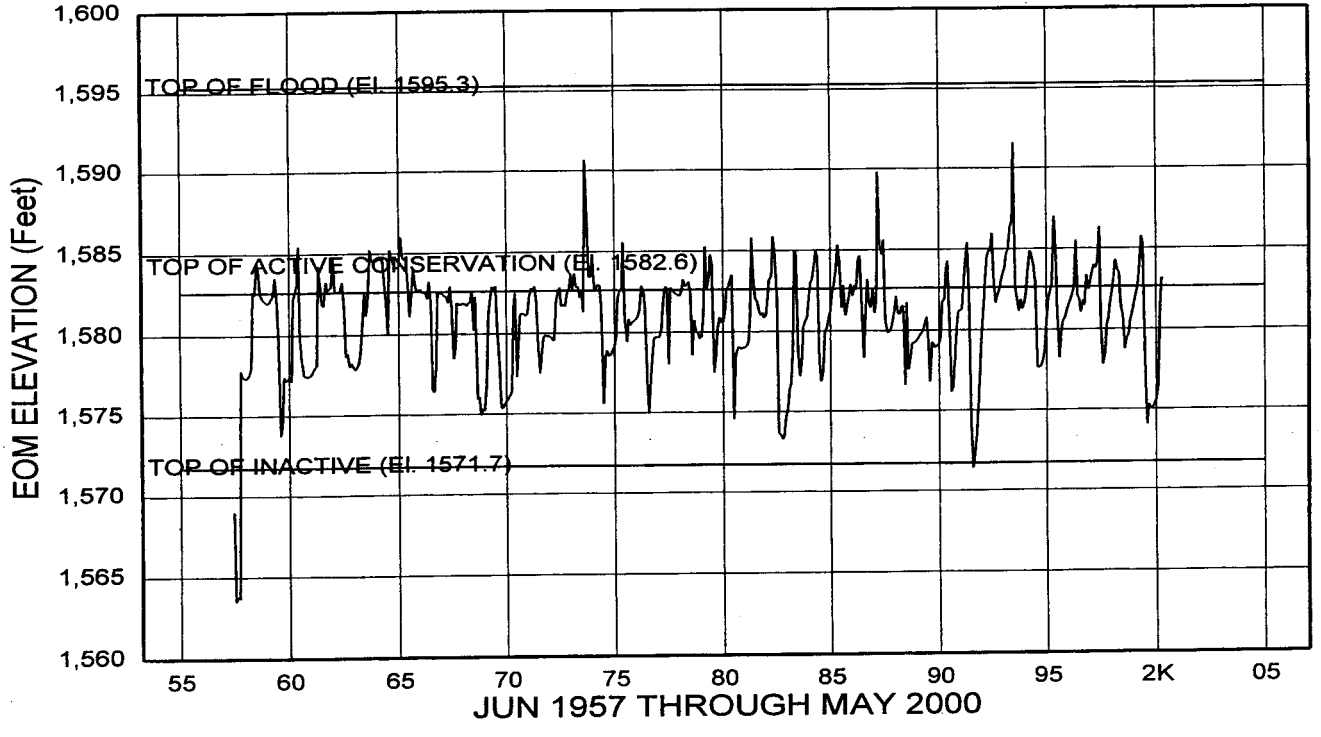


Exhibit #1

Republican River Compact Report
U.S. Geological Survey
June 8, 2000

The U.S. Geological Survey, Nebraska District, receives funding through the Federal Collection of Basic Records program in support of compacts for 10 streamflow stations in the Republican River Basin, 9 of which have real-time data collection platforms (DCPs), listing attached. The Nebraska Department of Water Resources(DWR) provides coop funds to the USGS to operate one additional station, funding shared by the Corps of Engineers, and for USGS review and publishing of records at three other sites that DWR operates. All four of these sites have DCPs. The Corps of Engineers provides funds for the one site shared with DWR and complete funding for three other stations. They also provide funding for the operation of seven DCP's. In summary, the Nebraska District operates 14 stations in the basin, reviews and publishes 3 others, and maintains 15 DCP's. The Bureau of Reclamation installed a DCP at Courtland Canal at NE-KS State Line which is used also in record collection. The real-time information can be accessed at:

http://www-ne.cr.usgs.gov

The Kansas District, USGS, operates gages on Sappa Creek, Beaver Creek, and Prairie Dog Creek in Kansas, and at Republican River nr Hardy, NE.

Mean streamflow for the 1999 water year was less than the mean flow for the period of record at all sites in the basin. Lowest annual means for period of record occurred at Rock Creek at Parks and Republican River at Stratton. Streamgaging sites at and upstream from Republican River near Orleans, except for Driftwood Creek (about 35% nonexceedance) had annual mean flows less than the 25-percent quartile point of annual flows which indicates they were less than the normal range of flow. Most sites recorded flows actually less than the 10 percent duration point. The annual mean flows at sites in the Sappa Creek/Beaver Creek Basin and in the remainder of the Republican Basin downstream were in the lower portion of the normal range (25-50% quartile).

The 1999 water-year records were provided to the Engineering Committee of the Compact and are published in the Water Resources Data Report for Nebraska for 1999.

Exhibit #2

REPUBLICAN RIVER BASIN GAGING STATIONS, PUBLISHED BY USGS

Federally funded Republican River Compact stations

06821500 Arikaree R at Haigler----------DCP
06823000 N Fk Republican R at CO-NE State Line-------DCP
06823500 Buffalo Creek nr Haigler(elec. data logger)
06824000 Rock Creek at Parks----------DCP
06827500 S Fk Republican R nr Benkleman----------DCP
06835500 Frenchman Creek at Culbertson----------DCP
06836500 Driftwood Creek nr McCook----------DCP
06838000 Red Willow Creek nr Red Willow----------DCP
06847500 Sappa Creek nr Stamford----------DCP
06852500 Courtland Canal at NE-KS State Line----USBR DCP

Coop program, USGS and Nebraska DWR, Corps of Engineers

06828500 Republican R at Stratton----------DCP

Coop program, USGS(review, publish, DCP maintenance)
DWR(operation), Corps of Engineers funds DCP

06834000 Frenchman Creek at Palisade----------DCP
06843500 Republican R at Cambridge----------DCP
06853020 Republican R nr Guide Rock----------DCP

Corps of Engineers funded

06837000 Republican R at McCook----------DCP
06844500 Republican R nr Orleans----------DCP
06849500 Republican R below Harlan Co. Dam----------DCP

Republican River Basin gaging stations in Kansas
Operated by USGS, Kansas District, Upstream of Republican River near Hardy gaging station

06844900 South Fork Sappa Creek nr Achilles, KS
06845000 Sappa Creek nr Oberlin, KS----------DCP
06845110 Sappa Creek nr Lyle, KS----------DCP
06846000 Beaver Creek at Ludell, KS----------DCP
06846500 Beaver Creek at Cedar Bluffs, KS----------DCP
06847900 Prairie Dog Cr abv Keith Sebelius Lake, KS--DCP
06848000 Prairie Dog Creek at Norton, KS----------DCP
06848500 Prairie Dog Creek nr Woodruff, KS----------DCP
06853500 Republican River nr Hardy, NE----------DCP

SUMMARY OF STREAMFLOWS 1999 WATER YEAR, REPUBLICAN RIVER BASIN

Station Number	Station Name	1999 Mean	Period of Record Mean	Median of Annual Means	Lowest Annual Mean,	Year
06821500	Arikaree R at Haigler	9.40	19.6	15.3	3.69	1978
06823000	N Fk Republican R at CO-NE Line	30.1	44.6	43.3	27.4	1998
06823500	Buffalo Creek nr Haigler	4.45	6.79	6.45	2.51	1998
06824000	Rock Creek at Parks	8.87	13.0	13.4	8.87	1999
06827500	S Fk Republican R nr Benkleman	13.1	41.4	33.2	9.79	1953
06828500	Republican R at Stratton	49.2	112	101	49.2	1999
06834000	Frenchman Creek at Palisade	41.3	70.5	66.6	37.9	1991
06835500	Frenchman Creek at Culbertson	41.4	75.8	75.0	35.7	1991
06836500	Driftwood Creek nr McCook	6.98	9.60	7.60	1.12	1953
06837000	Republican R at McCook	75.3	149	123	70.1	1991
06838000	Red Willow Creek nr Red Willow	8.57	13.0	12.1	7.90	1992
06843500	Republican R at Cambridge	132	240	199	110	1991
06844500	Republican R nr Orleans	139	259	217	78.4	1991
06846500	Beaver Creek at Cedar Bluffs,KS	2.69	13.8	5.38	0	1991
06847500	Sappa Creek nr Stamford	22.4	46.2	22.4	.59	1981
06848500	Prairie Creek nr Woodruff, KS	16.3	27.4	15.1	.05	1991
06849500	Republican R blw Harlan Co. Dam	110	224	172	37.4	1992
06852500	Courtland Canal at NE-KS Line	73.0	77.6	77.6	19.5	1955
06853020	Republican River at Guide Rock	159	301	219	52.1	1991
06853500	Republican River nr Hardy	239	358	437	72.5	1991

Exhibit #2

Report of the Engineering Committee
for the Republican River Compact Administration
June 8, 2000

Assignment and background work

At the 1999 annual meeting of the Republican River Compact Administration, the Commissioners assigned the Engineering Committee to review potential hydrologic data to include in its annual reports. The committee was asked to bring its recommendations for such data to the next annual meeting of the Administration along with examples for the compact year 1999 for review by the commissioners. The commissioners specifically expressed interest in publishing summaries of reservoir operations data, streamflow data, canal diversion data, and precipitation for the preceding compact year.

During May, David Barfield provided the engineering committee members with a summary of the assignment from the transcript and examples of data published in the annual reports of other compact to which Kansas is party. Dick Stenzel provided the engineering committee with a copy of the data published in the Rio Grande Compact that was referenced by Hal Simpson at the annual meeting. David also provided the committee with links to Bureau of Reclamation data on the internet regarding reservoir operations and canal diversions which is publishing their annual operating plans.

Engineering Committee meeting of May 31, 2000

On May 31, 2000, the engineering committee held a conference call to discuss the assignment and potential recommendations to the Compact Administration. Those on the conference call included: David Barfield and Scott Ross from the Kansas, Ann Bleed and Jeff Shafer for Nebraska, and Dick Stenzel for Colorado. Below is a summary of findings and resulting recommendations of the committee.

Streamflow data

Prior to the annual meeting, streamflow data is available for the prior compact year (water year) from the both the U.S. Geological Survey and the State of Nebraska.

After discussion, the committee agreed to recommend the publishing of a table of monthly means, minimums, and maximums, and total monthly discharge in acre-feet for the gages listed below. In addition, a bar graph of annual discharges in acre-feet for the last 10 years should be included in the annual report. Samples are attached.

Gages listed in the Compact Administration's methods and recommended for publishing:
Arikaree River at Haigler, Nebraska.
North Fork Republican River at Colorado-Nebraska State line
Buffalo Creek near Haigler, Nebraska

Rock Creek at Parks, Nebraska
South Fork Republican River near Benkelman, Nebraska
Frenchman Creek at Culbertson, Nebraska
Driftwood Creek near McCook, Nebraska
Red Willow Creek near Red Willow, Nebraska
Medicine Creek below Harry Strunk Lake, Nebraska
Beaver Creek near Beaver City, Nebraska
Sappa Creek near Stamford, Nebraska
Prairie Dog Creek near Woodruff, Kansas
Courtland Canal at Nebraska-Kansas State line
Republican River near Hardy, Nebraska

note: Beaver Creek near Beaver City and Medicine Creek below Harry Strunk Lake are published the State of Nebraska

Additional U.S.G.S. gages added to the recommended list by various committee members:
Beaver Creek at Cedar Bluffs, Kansas
Republican River near Orleans, Nebraska
Republican River below Harlan County, Nebraska
Republican River at Guide Rock, Nebraska
Republican River at Concordia, Kansas
Republican River at Clay Center, Kansas

While not recommended by the committee for publishing in the annual report, gage data is also available from the U.S.G.S. at the following locations:

Republican River at Stratton, Nebraska
Frenchmen Creek at Palisade, Nebraska
Republican River at McCook, Nebraska
Republican River at Cambridge, Nebraska
Sappa Creek near Oberlin, Kansas
Sappa Creek near Lyle; Kansas
Beaver Creek at Ludell; Kansas
Prairie Dog Cr Ab K Sebelius Lk, Kansas
Prairie Dog Cr at Norton, Kansas
White Rock Creek near Burr Oak, Kansas
White Rock Creek at Lovewell, Kansas
Republican River below Milford Dam, Kansas

While not recommended by the committee for publishing in the annual report, gage data is also available from the State of Nebraska at the following locations:

Republican River at Trenton
Frenchman Creek near Imperial

Frenchman Creek near Enders
Stinking Water Creek near Palisade
Red Willow Creek above Hugh Butler Lake
Medicine Creek above Harry Strunk Lake
Muddy Creek at Arapahoe
Turkey Creek at Edison
Thompson Creek at Riverton
Elm Creek at Amboy

Reservoir Operations and Canal Diversions:

The committee reviewed records available from the Bureau of Reclamation in their annual operation plans related to reservoir operations and canal diversions.

For the Bureau's Republican River basin projects (Bonny, Enders, Swanson, Hugh Butler, Harry Strunk, Lovewell) and Harlan County Reservoir, the following data is available: monthly inflows, outflows and releases, gross evaporation, precipitation, and end of month content.

Regarding canal diversions, the Bureau's AOP includes the monthly diversion amounts and amounts delivered to farms for the canals listed below:

Frenchman Valley Irrigation District
- Culbertson Canal

H & RW Irrigation District
- Culbertson Extension Canal

Frenchman-Cambridge Irrigation District
- Meeker-Driftwood Canal
- Red Willow Canal
- Bartley Canal
- Cambridge Canal

Almena Irrigation District
- Almena Canal

Bostwick Irrigation District in Nebraska
- Franklin Canal
- Naponee Canal
- Franklin Pump Canal
- Superior Canal
- Courtland Canal (Nebraska)

Kansas-Bostwick Irrigation District
- Courtland Canal above Lovewell
- Courtland Canal below Lovewell

Attached are portions Tables 2 and 6 of Bureau's AOP both reservoir operations data and canal diversions which the committee recommends for publishing in the annual report.

In addition the state of Colorado has records of diversions for the Pioneer Ditch.

Precipitation:

Included in the tables above is precipitation data at the Bureau's reservoirs and Harlan County. In addition to these tables, the committee would recommend the preparation of graphs of 10 years of annual totals at the same stations.

Precipitation data is available at a significant number of additional sites in all three states.

Kansas' regional precipitation stations include; Atwood, Colby, Goodland, Norton, Oberlin, St. Francis, Belleville, Clay Center, Concordia, and Mankato.

Nebraska precipitation stations include: Atlanta 2 WNW, Beaver City, Benkelman, Cambridge, Culbertson, Curtis 3 NNE, Elwood 8 S, Enders Lake, Guide Rock, Haigler, Hardy, Harlan County Lake, Hayes Center, Holdrege, Imperial, Madrid, McCook, McCook 17 NNW, Medicine Creek Dam, Moorefield, Naponee, Orleans 2 W, Palisade, Ragan, Red Cloud, Red Willow Dam, Stockville, Stratton, Trenton Dam, Wallace 2 W, Wauneta 3 NW, Wellfleet, Wilsonville

Publishing of the data

Since the U.S. Geological Survey and Bureau of Reclamation both present reports to the Compact Administration each year at the annual meeting, and since data recommended for publishing in the annual report are from these agencies, the committee further recommended that the Administration request the two agencies include the appropriate data in their reports.

David Barfield
Kansas

Scott Ross
Kansas

Ann Salomon Bleed
Nebraska

Jeff Shafer
Nebraska

Richard Stenzel
Colorado

Ken Knox
Colorado

STATION.--06821500 ARIKAREE RIVER AT HAIGLER, NE

LOCATION.--Lat 40°01'45", long 101°58'10", in NE1/4 NE1/4 sec.29, T.1 N., R.41 W., Dundy County, Hydrologic Unit 10250001, on right bank at downstream side of bridge on U.S. Highway 34, 1,3 mi upstream from Burlington Northern Inc. bridge, 1.9 mi upstream from confluence with North Fork Republican River, 2 mi. northwest of Haigler, and 3.2 mi downstream from Kansas-Nebraska State line.

DRAINAGE AREA.--1,700 mi^2, of which about 1,020 mi^2 contributes directly to surface runoff. **PERIOD OF RECORD.**--October 1931 to current year. Monthly discharge only for some periods, published in WSP 1310.

REMARKS.--Records fair. Natural flow affected by ground-water withdrawals and diversions for irrigation of about 1,500 acres in Colorado and by return flow from Haigler Canal.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
TOTAL	201.1	48.32	9.56	12.39	12.85	166.3	369.8	282.3	750.7	9.48	1444	1256
MEAN	6.49	1.61	.31	.40	.46	5.37	12.3	9.11	25.0	.31	46.6	4.19
MAX	17	16	.52	.56	.67	26	23	20	229	1.3	337	12
MIN	2.4	.43	.23	.28	.37	.30	6.1	3.3	.39	.00	.17	.94
AC-FT	399	96	19	25	25	330	733	560	1490	19	2860	249

WTR YR 1999 TOTAL 3431.97 MEAN 9.40 MAX 337 MIN .00 AC-FT 6810

STATION.--06823000 NORTH FORK REPUBLICAN RIVER AT COLORADO-NEBRASKA STATE LINE

LOCATION.--Lat 40°04'10", long 102°03'05", in SE1/4 NW1/4 sec.10, T.1 N., R.42 W., Dundy County, Nebraska, Hydrologic Unit 10250002, on right bank 100 ft east of Colorado-Nebraska State line, 9.5 mi upstream from confluence with Arikaree River, and at mile 448.

DRAINAGE AREA.--2,370 mi^2, of which about 174 mi^2 contributes directly to surface runoff.

PERIOD OF RECORD.--October 1930 to current year. Prior to October 1932, published as North Fork of Arikaree River at Colorado-Nebraska State line. Monthly discharge only for some periods, published in WSP 1310.

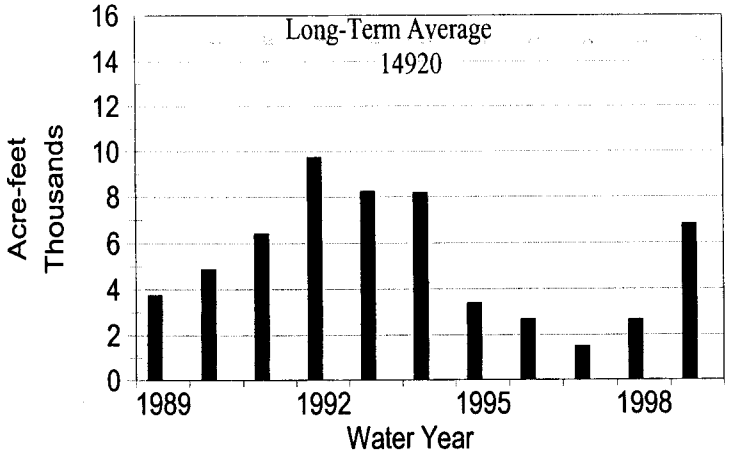
REMARKS.--Records poor. Natural flow affected by diversion in Haigler Canal for irrigation of about 2,700 acres in Colorado and Nebraska.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

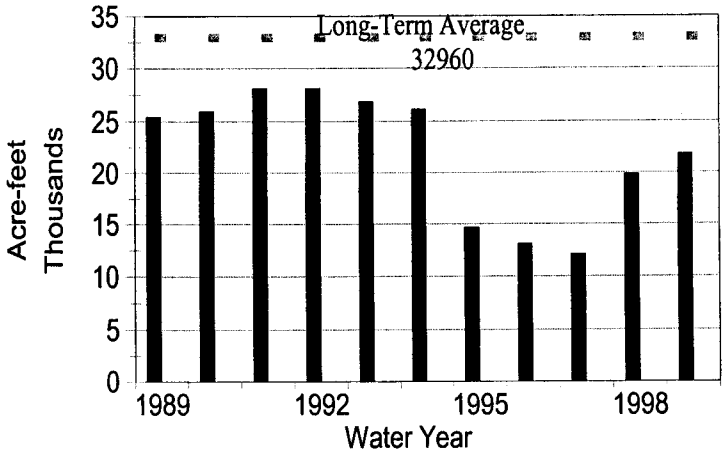
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
TOTAL	921	1387	1335	1620	1365	1688	638.5	506.2	665.0	204.8	322.5	345.1
MEAN	29.7	46.2	43.1	52.3	48.8	54.5	21.3	16.3	22.2	6.61	10.4	11.5
MAX	40	52	52	61	56	68	55	39	52	12	29	29
MIN	11	23	23	31	39	39	6.4	8.6	8.4	4.3	4.3	1.5
AC-FT	1830	2750	2650	3210	2710	3350	1270	1000	1320	406	640	685

WTR YR 1999 TOTAL 10998.1 MEAN 30.1 MAX 68 MIN 1.5 AC-FT 21810

06821500 Arikaree River at Haigler, NE
Total Annual Discharge



06823000 N.F. Republican R. at CO-NE
Total Annual Discharge



BOSTWICK DIVISION										
FRANKLIN UNIT										
HARLAN COUNTY LAKE										
Data from Corps of Engineers					End of Month Content	FRANKLIN CANAL			NAPONEE CANAL	
	Inflow	Outflow	Gross Evap.	Precip.		Release To Canal	Delivered To Farms		Release To Canal	Delivered To Farms
Month	(AF)	(AF)	(AF)	(Inches)	(AF)	(AF)	(AF)		(AF)	(AF)
Jan.	9,917	615	699	0.45	278,550	0	0		0	0
Feb.	11,226	555	914	0.02	288,307	0	0		0	0
Mar.	12,208	101	1,315	0.46	299,099	0	0		0	0
Apr.	14,628	0	2,209	3.04	311,518	0	0		0	0
May	23,911	0	4,188	6.03	331,241	0	0		0	0
June	24,456	11,134	4,704	5.21	339,859	2,379	94		44	4
July	17,395	48,741	7,877	2.22	300,636	14,442	5,259		1,605	830
Aug.	19,696	32,704	5,859	4.39	281,769	12,973	4,209		1,146	537
Sep.	7,517	5,101	5,747	2.57	278,438	2,574	688		34	22
Oct.	4,612	0	4,493	0.08	278,557	0	0		0	0
Nov.	8,767	0	3,180	0.21	284,144	0	0		0	0
Dec.	9,808	353	1,287	0.06	292,312	0	0		0	0
TOTAL	164,141	99,304	42,472	24.74	--	32,368	10,250		2,829	1,393
NOTE: Acres irrigated 1999: Franklin Canal - 11,254 acres; Naponee Canal - 1,628 acres.										

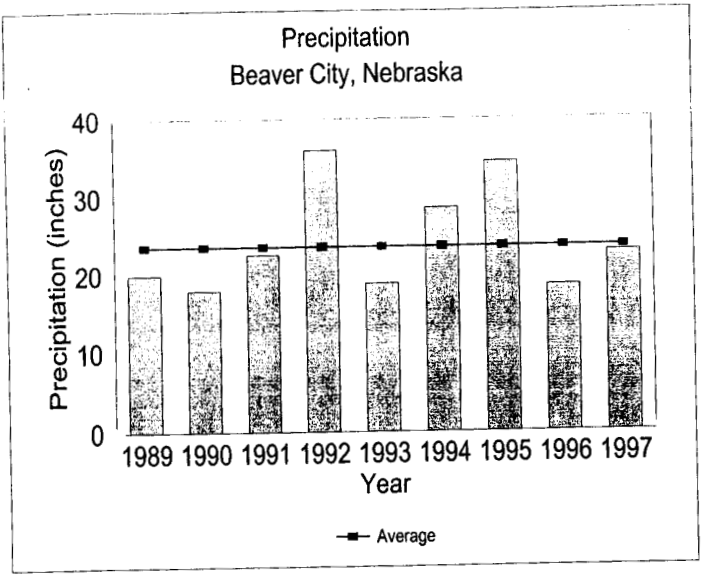
BOSTWICK DIVISION (Continued)										
COURTLAND UNIT										
			LOVEWELL RESERVOIR						COURTLAND (Below)	
	Est. Flow from White Rock	Inflow from Courtland	Total Inflow	Outflow	Gross Evap.	Precip.	End of Month Content		Release To Canal	Delivered To Farms
Month	Creek (AF)	34.8 (AF)	(AF)	(AF)	(AF)	(Inches)	(AF)		(AF)	(AF)
Jan.	1,836	0	1,836	12	157	0.48	32,528		0	0
Feb.	1,775	0	1,775	11	217	0.18	34,075		0	0
Mar.	1,714	0	1,714	12	379	0.56	35,398		0	0
Apr.	4,047	0	4,047	12	516	3.61	38,917		0	0
May	8,188	0	8,188	373	1,010	5.07	45,722		246	0
June	1,439	2,888	4,327	5,122	882	3.17	44,045		5,461	1,162
July	754	7,234	7,988	27,407	1,334	1.10	23,292		26,946	19,708
Aug.	732	6,614	7,346	14,541	655	2.67	15,442		13,831	7,757
Sep.	2,436	4,115	6,551	3,739	486	1.43	17,768		3,086	1,586
Oct.	0	0	0	12	486	0.00	17,270		0	0
Nov.	338	0	338	12	288	0.50	17,308		0	0
Dec.	647	0	647	6	142	0.52	17,807		0	0
TOTAL	23,906	20,851	44,757	51,259	6,552	19.29	--		49,570	30,213
NOTE: Acres irrigated 1999: Courtland Canal below Lovewell - 26,080 acres.										

BOSTWICK DIVISION (Continued)										
SUPERIOR-COURTLAND UNIT										
						COURTLAND CANAL - ABOVE LOVEWELL				
FRANKLIN PUMP CANAL			SUPERIOR CANAL			NEBRASKA USE			KANSAS USE	
	Diverted To Canal	Delivered To Farms	Diverted To Canal	Delivered To Farms	Total Diversion	Total	Delivered To Farms		Diversion To Canal	Delivered To Farms
Month	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)		(AF)	(AF)
Jan.	0	0	0	0	0	0	0		0	0
Feb.	0	0	0	0	0	0	0		0	0
Mar.	0	0	0	0	0	0	0		0	0
Apr.	0	0	0	0	0	0	0		0	0
May	0	0	0	0	643	0	0		0	0
June	1,629	1,134	2,724	555	11,507	236	145		5,978	1,017
July	1,251	791	7,550	3,506	25,992	1,302	957		15,834	9,301
Aug.	82	28	4,545	1,725	16,549	749	669		7,360	3,653
Sep.	0	0	464	135	8,243	68	73		1,421	429
Oct.	0	0	0	0	210	0	0		0	0
Nov.	0	0	0	0	0	0	0		0	0
Dec.	0	0	0	0	0	0	0		0	0
TOTAL	2,962	1,953	15,283	5,921	63,144	2,355	1,844		30,593	14,400
NOTE: Acres irrigated 1999:			Franklin Pump Canal - 2,106 acres; Superior Canal - 5,952 acres.							
			Courtland Canal-Nebraska use - 1,967 acres.							
			Courtland Canal-Kansas use - 12,707 acres.							

KANASKA DIVISION									
ALMENA UNIT									
KEITH SEBELIUS LAKE									
	Inflow	Outflow	Gross Evap.	Precip.	End of Month Content	Release To City Of Norton	ALMENA CANAL Diversions To Canal		Delivered To Farms
Month	(AF)	(AF)	(AF)	(Inches)	(AF)	(AF)	(AF)		(AF)
Jan.	313	26	132	0.21	30,937	26	0		0
Feb.	468	24	171	0.11	31,210	24	0		0
Mar.	815	27	283	1.22	31,715	27	0		0
Apr.	1,422	34	761	4.92	32,342	34	0		0
May	1,677	47	923	5.18	33,049	47	336		0
June	1,500	53	1,052	3.98	33,444	53	286		0
July	1,228	3,437	1,397	3.44	29,838	69	2,873		1,238
Aug.	1,658	1,415	988	5.64	29,093	55	1,463		810
Sep.	215	107	839	0.84	28,362	50	196		0
Oct.	272	104	589	0.06	27,941	42	203		0
Nov.	388	92	296	0.14	27,941	33	98		0
Dec.	542	89	160	0.24	28,234	28	0		0
TOTAL	10,498	5,455	7,591	25.98	--	488	5,455		2,048
NOTE: Acres irrigated 1999: Almena Canal - 4,865 acres.									

TABLE 6
WATER DIVERTED IN 1999 AND THE
ESTIMATED DIVERSION FOR 2000
(Units - Acre-Feet)

Irrigation District and Canal	1999 Irrigation Operations From	To	10-Year Average Diversion (1989-98)	1999 Diversion	Estimated Diversion in 2000
Frenchman Valley Irrigation District					
Culbertson Canal	4/01	8/26	10,121	8,089	10,000
H & RW Irrigation District					
Culbertson Extension Canal	4/19	8/23	12,067	13,056	13,000
Frenchman-Cambridge Irrigation District					
Meeker-Driftwood Canal	6/21	9/03	29,338	23,202	32,500
Red Willow Canal	6/29	9/03	7,405	6,121	8,500
Bartley Canal	6/16	9/03	8,321	7,258	10,000
Cambridge Canal	6/18	9/03	25,370	21,536	29,000
Total Frenchman-Cambridge Irrigation District			70,434	58,117	80,000
Almena Irrigation District					
Almena Canal	5/01	8/23	3,051	5,455	5,000
Bostwick Irrigation District in Nebraska					
Franklin Canal	6/21	9/10	25,152	32,368	33,000
Naponee Canal	6/29	9/02	2,192	2,829	3,000
Franklin Pump Canal	7/02	9/03	2,543	2,962	3,000
Superior Canal	6/16	9/04	12,900	15,283	15,000
Courtland Canal (Nebraska)	6/01	9/30	1,633	2,355	2,500
Total Bostwick Irrigation District in Nebraska			44,420	55,797	56,500
Kansas-Bostwick Irrigation District					
Courtland Canal above Lovewell	6/10	9/17	23,430	30,593	31,000
Courtland Canal below Lovewell	5/24	9/10	40,250	49,570	49,000
Total Kansas-Bostwick Irrigation District			63,680	80,163	80,000


Precipitation
Beaver City, Nebraska
Precipitation (inches)
40
30
20
10
0
1989 1990 1991 1992 1993 1994 1995 1996 1997
Year
Average