



## Missouri River troubles repeat themselves

By Pat Fridgen

In some instances, mistakes can have devastating consequences. But, they often offer lessons, helping us avoid those same mistakes again in the future. As people across the state wait impatiently for the U.S. Army Corps of Engineers (Corps) to make a decision on their future operating plans for the Missouri River, it is the hope of many concerned North Dakotans that the Corps has learned from the past.

In the late 1980s and early 1990s, the Missouri River Basin experienced its most severe drought since the construction of the mainstem reservoirs. In response, the Army Corps implemented water conservation measures beyond the guidelines in the Missouri River Master Manual. However, as many North Dakotans remember, their actions were too little, and too late.

The Corps' Master Manual, developed back in 1960 and revised in the 1970s, proved to be outdated and ineffective in dealing with the severe water shortages experienced in the Missouri Basin during the 1988-1992 drought. In North Dakota, most boat ramps along the shores of Lake Sakakawea were left high and dry, the lake's cold water fishery was all but devastated, and area business owners who depend on the recreational industry for their livelihood suffered tremendous financial losses. Today, almost ten years later and after several years of above average precipitation, Lake Sakakawea's

fishery and recreational industry have finally started to show signs of full recovery. Unfortunately, the recovery may be short lived.

As of October 2000, Lake Sakakawea was about ten feet lower than it was in the fall of 1999. This is a result of both the Corps' management of the reservoir system and natural conditions. Below average precipitation in the upper reaches of the Basin produced runoff that was 41 and 47 percent of normal in August and September of this fall, while discharge from the system at Gavins Point, South Dakota averaged 95 percent of normal. Simply put, the amount of water entering the Missouri River system is far less than what is being discharged.

Also in October, Lake Sakakawea had fallen to an elevation of 1832.6 msl, which is more than seven feet below its average end of October elevation. The total Missouri River system storage dipped to approximately 51 million acre feet (maf), almost 7 maf below normal. What this means, is if upper basin drought conditions continue for another year or two, the Missouri River reservoir system could be facing similar conditions as those of the 1988-1992 drought.



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The question may be asked: What is being done to prepare the mainstem reservoirs for impending drought conditions and related water shortages? Unfortunately, the answer is very little. The reservoirs are being managed much the same today as they were in the 1960s. The writers of the Master Manual in the 1960s expected a thriving shipping industry that never materialized. Further more, they did not anticipate a booming recreational industry that certainly has materialized. One exception, the protection of endangered species, has prompted minor changes in the operation of the river. However, those alternative management practices are not intended to provide water conservation, which North Dakota desperately needs in the Missouri system at this time.

Most perplexing, is that the \$1.3 billion in annual benefits from hydropower, water supply, and recreation in the Missouri River basin are all being jeopardized at the expense of a \$7 million navigation industry. In 1993, the Corps estimated annual recreational benefits from the Missouri River system to be \$22.2 million just in North Dakota. Today, it is likely much higher. One indicator of that is state park visitation. Fort Stevenson State Park's visitation went from 59,000 in 1991 to 120,000 in 1999. Even more impressive was Sakakawea State Park, which had 190,000 visitors in 1991, and then increased to 270,000 visitors by 1999.

Discussions regarding Master Manual revisions over the past decade have made it clear that it is no longer a recreation versus navigation issue. Now, it has become a naviga-

tion versus all other authorized purposes issue.

Supporters of navigation in the lower reaches of the Missouri River still support current operating procedures, because they are largely geared toward the barge industry. That is why all Missouri River basin states, except Missouri, have requested substantial water conservation measures for the mainstem reservoirs.

However, the alternative management practices being requested by seven of the eight upper basin states are beyond those outlined in the Annual Operating Plan of the Missouri River Master Manual. Therefore, the Corps has been reluctant to take any steps toward more substantial water conservation measures in the upper basin reservoirs. Even though all signs point toward potentially serious water shortages in the reservoirs, the Corps plans to support navigation at nearly full service levels through December 1, and then reduce flows based on guidelines in the Master Manual if they feel it is necessary. But, as pointed out before, it is feared that those guidelines will not provide sufficient water conservation to save Lake Sakakawea's recreational industry if drought conditions persist.

At an October 17<sup>th</sup> Army Corps of Engineers public meeting to review the 2000-2001 draft Annual Operating Plan, North Dakota Governor, Ed Schafer told Corps officials "If I had the power. . . I would stop you in your tracks at the way you're operating the river today." In addition to Governor Schafer, several other concerned North Dakotans expressed their disappointment at the way the Corps was managing the river. Unfortunately, as one person after another expressed their concerns for the Missouri River system's water levels, it seemed as though everyone except the Army Corps had learned from lessons of the past. ■

## SWC construction crew had busy summer



Crew works on Pheasant Lake Dam in Dickey County, August 2000.

*By Ronald Swanson*

The State Water Commission (SWC) construction crew was busy with several projects this past summer. Some of their larger projects included repairs to dams in Nelson, LaMoure, and Dickey Counties, and the U.S. Geological Survey (USGS) gaging stations in the eastern part of the state.

In May and June, the construction crew made repairs to Tolna Dam in Nelson County. Repairs included the installation of an abutment drain to collect seepage that was occurring around the spillway structure. The spillway has undergone several repairs in the past, as it is an older rubble masonry chute that was initially constructed by the Work Progress Administration back in the 1930s. Further repairs at Tolna Dam included the installation of a new drawdown valve.

Project costs were shared by the Nelson County Water Resource District, the SWC, and the Federal Emergency Management Agency (FEMA). The total cost of repairs at Tolna Dam was about \$25,000.

By mid-summer, the SWC construction crew was repairing the Cottonwood Creek Dam in LaMoure, installing a 16-inch polyethylene

low-level drawdown pipe. The primary purpose of the drawdown pipe is to discharge stagnant, oxygen deficient water from the bottom of the reservoir. The old 12-inch welded steel outlet pipe was grouted shut. The total cost of repairs was \$40,000, which was shared by the SWC, the North Dakota Game and Fish Department (NDGF), and the LaMoure Water Resource District.

Pheasant Dam in Dickey County was the last dam repaired by the construction crew this past summer. The face of the concrete spillway had experienced damage from continued exposure to ice pressure throughout the years. In response, the construction crew replaced the top three feet of the damaged spillway with new concrete, and added further support and protection to the dam by placing additional concrete along the two sides of the structure. It is expected that the new concrete will protect the dam from future ice-related damage. The repair costs of \$50,000 were shared by the SWC, NDGF, the Dickey County Water Resource District, and FEMA.

To close out the 2000 construction season, the SWC construction crew is repairing USGS gaging stations in the eastern portion of the state. The crew is also helping with construction efforts related to recovery in areas devastated by natural disasters. ■



# THE WATER PRIMER

## Water: A Tour Through Time (Part 1)

*Much has happened with water development since North Dakota became a state. The next few issues of The Primer will feature a timeline that gives a brief glimpse of the past 110 years in water development.*

**1890** - Two field parties under the direction of Morris Bien (U.S. Reclamation Service) investigated the possibilities for diverting water from the Missouri River across the divide separating the Missouri Valley from the valleys of the Mouse, the Sheyenne, and the James. Working from Minot during the late summer and fall, the reconnaissance/survey party ran 730 miles of levels without finding a suitable pass through the divide. The lowest point found in that divide was about 200 feet above the low water level of the Missouri River at Buford, where the Missouri enters the State, so the project was abandoned.

**1904** - State Engineer recommends early examination of a proposed project involving the diversion of the Mouse River to Devils Lake.

**1904** - Discussion of a high dam on the Missouri River - deemed impractical due to lack of proper foundations as reported by riverboat pilots.

**1905** - The Office of the State Engineer was officially created by the Legislature. Professor E. F. Chandler was appointed as North Dakota's first State Engineer.

**1905** - Construction started on the 60,000 acre Lower Yellowstone Irrigation Project, 19,500 acres of which are located in North Dakota.

**1906** - The U.S. Reclamation Service started construction of a steam power

plant at Williston using lignite coal as fuel. The purpose of this plant was to supply power for pumping for irrigation of the Williston Project, as well as the Buford-Trenton Project. As this was a new departure in the field of reclamation, several new and untried problems presented themselves.

**1909** - On January 11, the United States and Great Britain entered into a treaty relating to boundary waters and questions arising between these two countries. This treaty provided that an International Joint Commission (IJC) be created to have jurisdiction of boundary waters. The IJC consists of six members, three from each country.

**1923** - North Dakota portion of the Lower Yellowstone Irrigation Project declared 99 percent complete.

**1937** - The State Water Conservation Commission was created by the Legislature. The Commission was composed of the Governor, the Commissioner of Agriculture and Labor, and five other members appointed by the Governor.

**1938** - (April 2) The U.S. Congress gave its approval to the formation of the Tri-State Water Commission to address water management across jurisdictions in the Red River Basin. It included representatives from North Dakota, South Dakota and Minnesota.

**1939** - Construction began on the 5,000 acre Lewis and Clark Irrigation Project in McKenzie County, six miles southwest of Williston in the Missouri River Valley.

**1944** - Flood Control Act of 1944 authorizes the Pick-Sloan Missouri Basin

Plan. The primary purpose is for flood control, navigation, irrigation, and hydropower, which would be facilitated by the construction of six main stem dams. They are Fort Peck, Garrison, Oahe, Big Bend, Fort Randall and Gavins Point.

**1945** - Ground-water survey program initiated on a cooperative basis by the Ground-Water Branch of the U.S. Geological Survey and the State Water Commission. The State Geologist acts as the technical advisor for the Water Commission in matters pertaining to ground water and otherwise assists the program.



Driving sheet piling in core trench, Garrison Dam, July 1948.

**1947** - (October 4) Excavation began for the embankment of Garrison Dam at a site 72 miles north of Bismarck in McLean and Mercer Counties. A multi-purpose structure, Garrison Dam was designed to accomplish these objectives: (1) provide and stabilize municipal water supplies; (2) provide irrigation waters; (3) provide for flood control; (4) produce hydroelectric power; (5) permit diversion to Devils Lake and the James River basin regions; (6) provide facilities for recreation and wildlife; (7) maintain minimum low water flow on the lower Missouri in the interest of sanitation; and (8) improve navigation on the Missouri and Mississippi Rivers. ■