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Flooding The Missouri Valley The Politics Of Dam Site Selection And Design

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In December 1944 the United States Congress passed a Rivers and Harbors Bill that authorized the construction of the Pick-Sloan plan for Missouri River development. From 1946 to 1966, the United States Army Corps of Engineers, with the assistance of private contractors, implemented much of that plan in the Missouri River Valley. In that twenty-year period, five of the world's largest earthen dams were built across the main-stem of the Missouri River in North and South Dakota. The size of these structures defies the imagination. Fort Randall Dam in southeast South Dakota is 160 feet high and 10,700 feet long. The reservoir behind it stretches 140 miles north-northwest along the Missouri Valley. Oahe Dam, near Pierre, South Dakota, surpasses even Fort Randall Dam at 242 feet high and 9300 feet long. Oahe's reservoir stretches 250 miles upstream. The completion of Garrison Dam in North Dakota, and Oahe, Big Bend, Fort Randall, and Gavin's Point dams in South Dakota resulted in the inundation of nearly 700 miles of the Missouri Valley from Yankton, South Dakota, to Williston, North Dakota.

The inundation of such a vast stretch of the Missouri River Valley caused tremendous changes in the lifestyles of the people who lived within or near the valley. Many European-American ranchers and farmers had to relocate their families and reestablish agricultural enterprises in other areas. The residents of Niobrara, Nebraska, and Pollock, South Dakota, moved their homes and businesses after two Pick-Sloan dams flooded the towns.

Indians in the Dakotas and Nebraska were affected by the inundation of their reservation lands—all of the Missouri Valley bottomlands located on the Crow Creek, Lower Brule,
Cheyenne River Sioux, Standing Rock, and Fort Berthold reservations. Indians on these reservations, and on the Yankton, Rosebud, and Santee reservations, lost a total of 353,313 acres for reservoir water storage. In addition, the Indian towns of Fort Thompson (Crow Creek Reservation), Lower Brule (Lower Brule Reservation), Cheyenne River Agency (Cheyenne River Sioux Reservation), and nine towns on the Fort Berthold Reservation were inundated. Approximately 3538 Indians were forced to relocate from the valley lands to the uplands or to off-reservation towns. Another 6900 Indians were affected in varying degrees of severity.

This article addresses a series of related questions. First, why did the Indians lose so much land and so many communities to the reservoirs of the Pick-Sloan Plan? Were the inundations of Indian land the inevitable result of a decision-making process that objectively chose the best sites for dams and reservoirs on the Missouri River? Furthermore, why were Pick-Sloan's Missouri River dams and reservoirs designed and constructed at locations that were so disadvantageous to Indian interests? Why were the reservoir water storage levels behind each dam so high that large Indian populations had to relocate above the valley floor? In order to answer these questions, I begin with an examination of the origins of the Pick-Sloan Plan then detail the various factors that determined the location of Pick-Sloan's Missouri River dams. I conclude by arguing that the sites of the Pick-Sloan Plan dams were chosen primarily for
political reasons rather than because of geological or engineering considerations.

ORIGINS OF THE PICK-SLOAN PLAN

The Pick-Sloan Plan emerged out of the efforts of individuals and organizations throughout the Missouri River Basin who sought river development. The most important of these was the Missouri River States Committee, formed in the early 1940s to promote a comprehensive development scheme for the Missouri River. Pick-Sloan was largely the creation of the Missouri River States Committee, which brought together numerous interest groups that favored Missouri River development and enabled them to coordinate their efforts. The organization's power stemmed from its ability to lobby the public and Congress.6

In the fifty years before 1940, small towns and counties throughout the Dakotas had promoted small, localized river development schemes. For instance, business and political organizations in Mobridge, South Dakota, had sought a dam on the Missouri River to their west since the early 1920s. Mitchell, South Dakota, boosters had wanted a hydroelectric facility at the Big Bend of the Missouri since the 1910s. And members of the Lower Brule Tribe had lobbied the Bureau of Indian Affairs and the Department of Interior for the construction of a dam or power plant on reservation land at Big Bend in the 1930s. All of these early promotional efforts came to naught, as no one river project garnered enough statewide political or financial support, and such federal officials as those in the Army Corps of Engineers who viewed dams as a threat to navigation below Sioux City opposed Missouri River development in the Dakotas prior to the 1940s.7

Beginning in the early forties, Missouri River development efforts expanded. Major cities and states within the Missouri River Basin began to organize to promote a program of interstate or federal development of the river. The states of the upper Missouri River Basin (Montana, North Dakota, South Dakota, Wyoming) had endured a decade of drought and hardship in the 1930s and viewed impounded Missouri River water as a resource for averting future economic downturns and agricultural disasters. These states hoped to solve their economic problems, stop out-migration, and prevent the hardships that the unpredictable weather patterns of the Great Plains had had on their economies.8

Upper Missouri River Basin residents hoped to develop the Missouri River for irrigation, hydroelectric power, and navigation. Aware of the multiple economic problems in the Missouri River Basin, Clifford Stone of Colorado, a lawyer and judge who had been instrumental in water resource development in his home state and who had organized an interstate coordinating committee to develop the Colorado River, advised the governors of the Missouri Basin to meet and coordinate their goals for river development.9 Stone believed that a unified basin lobbying group would be effective in securing project funds from the US Congress.10

In December 1941, one week after the bombing of Pearl Harbor and America's entry into World War II, representatives from the Bureau of Reclamation, Army Corps of Engineers, business interests in the upper basin, and government representatives from the states of South Dakota, North Dakota, Wyoming, Montana, and Nebraska met in Bismarck, North Dakota, to discuss and coordinate their plans for Missouri River development. This meeting resulted in the formation of the Missouri River States Committee (MRSC). Over the next several years, this committee became influential in pushing for a comprehensive, basinwide program for the Missouri River.11

In July 1942 the MRSC held its first meeting in Billings, Montana, and agreed to seek the participation of the other basin states in a permanent organization. By 21 May 1943 the MRSC had added Kansas, Missouri, and Iowa, for a total of eight members.12 This broader coalition of the Missouri River Basin's political and economic interests, however, did not
represent the Indians living on reservations adjacent to the Missouri River in Nebraska and the Dakotas. According to Robert Hipple, editor of the Pierre Capital Journal, a member of the MRSC's successor Missouri Basin Interagency Committee, and a congressional lobbyist for Missouri River development, the fully constituted MRSC did not have one Indian representative. As a matter of fact, the MRSC did not seek to include the Indians of the Missouri Valley within the organization. On the remote reservations of the upper Missouri River, the Indian population had little or no idea that plans and policies were being formulated that would dramatically affect their lives.

In 1943, the MRSC appointed South Dakota Governor Merrill Q. Sharpe (Fig. 2) as the committee's chairperson. Sharpe was a native of Kennebec, South Dakota, and had been involved in Missouri River development schemes since the early 1930s. Governor Sharpe would play a crucial role in the political compromises that created the Pick-Sloan Plan. Under his direction the MRSC conducted a massive public relations drive throughout the basin to garner public support for dams, channelization works, and levees along the Missouri River. Cities all along the valley, including Williston, Bismarck, Pierre, Chamberlain, Yankton, Sioux City, Omaha, and Kansas City, hosted public forums during 1942, 1943, and 1944, but no forums were ever held in any of the Indian communities along the Missouri River.

Why were the Indians of the Dakotas not represented on the MRSC and why were promotional meetings only held in off-reservation towns and cities? First, the Indian population on the reservations could not afford the hydroelectricity and irrigation water provided by any proposed project, so it did not make sense to the MRSC members to visit the reservations promoting products tribes could not buy. Second, the members of the MRSC conducted the meetings in the cities and towns that would provide the tax revenue for project construction. Since the reservation population could not contribute to financing the project, they did not, from the committee's point of view, need to be convinced of the project's benefits. Finally, members of the MRSC, and off-reservation population in general, believed Indian reservation lands were underutilized. They believed that reservation land was more beneficial to society at large and the Indians themselves if it was used for river control works than if it was left to the management decisions of the Indian population and the Bureau of Indian Affairs.

At the MRSC-sponsored public forums, Army engineers and Bureau of Reclamation field agents explained how the river would actually be engineered to meet society's demands. Business people and politicians explained the economic benefits of harnessing the water of the river. The public relations strategy was successful. There was no organized off-reservation opposition within the basin to controlling the Missouri River and using its waters to stabilize and promote the basin's economy.
In the early forties opposition to a basin-wide approach to controlling the Missouri River arose over the specifics of river development, not development itself. In 1943 and 1944, interest groups haggled over the types of dams and reservoirs to be built. Later in the decade, as several dams of the Pick-Sloan Plan neared completion, the debate centered on what organizations or governmental entities would administer the completed works. Different economic and political interests wanted different aspects of the river development plan stressed over others.18

Farmers, business people, and politicians from the upper basin (Montana, North Dakota, South Dakota, and Wyoming) represented by the National Reclamation Association, South Dakota Reclamation Association, Montana Stockgrowers Association and a number of chambers of commerce wanted dams that met their needs for irrigation and hydroelectric power. Lower basin residents from Kansas, Missouri, Iowa, and Nebraska, led by the Kansas City Chamber of Commerce, Mississippi Valley Association, and the National Rivers and Harbors Congress, wanted a plan that protected their cities from devastating floods, opened them to deep-draft barge traffic, and provided them with cheap power. The goals of the upper and lower basin did not coincide. If the upper basin irrigationists received the water they wanted for their crops, commercial interests in the lower basin believed they would have to abandon their navigation channel. Both upper basin and lower basin residents understood that water required to sustain a six-foot or possibly nine-foot navigation channel from Sioux City to St. Louis for eight months a year would lower the proposed upstream reservoirs and siphon off water required for irrigation. No one in the MRSC had an immediate solution to this conflict of interest.19

Devastating floods in 1943 exacerbated the debate over river development. Three successive floods from April through June ravaged towns and farms throughout the valley.20 Omaha, Nebraska, and the bottomlands east of Kansas City, Missouri, sustained heavy damage from the flood waters. The floods disrupted rail and river traffic along the Missouri and Mississippi rivers during the wartime emergency. High water also caused damage in lower Mississippi River states. The floods gave urgency to the demands for Missouri River development and prompted Congress, with the support of lower basin congressional representatives, to order the Army Corps of Engineers to submit a plan to prevent future flooding. The Corps responded with the Pick Plan, named for its author, Colonel Lewis Pick, the Army Corps of Engineers, Missouri River Division, Engineer.21

Under the Pick Plan, the Corps proposed building dams at Garrison in North Dakota, and Oahe (Pierre), Fort Randall (Lake Andes), and Gavin's Point (Yankton) in South Dakota.22 These four dams would fulfill lower basin demands for flood control and navigation and provide incidental irrigation and hydroelectric power benefits.23 The “Comprehensive Report on Missouri River Development,” an Army Corps of Engineers policy paper, stated that for the Pick dams, “Exclusive power storage would not be provided but power would be generated with water released for navigation and sanitation purposes.”24 The Corps made it clear that upper basin demands for irrigation water would be secondary to lower basin demands for navigation.

The Pick Plan also called for the construction of low, re-regulating dams below the big dams to eliminate destructive surges when the big dams released large amounts of water. Re-regulation prevented high water from eroding river banks, disrupting downstream navigation, and disturbing municipal water supplies. According to the Army Corps of Engineers “Comprehensive Report,” these re-regulating dams would “Be constructed a short distance downstream of each major dam, sufficiently high to create poundage to permit releases from the lower dam at a uniform rate.”25 Re-regulating dams were to be built below the Garrison, Oahe, and Fort Randall dams. The Army Corps of Engineers had not
chosen a definite site for a re-regulating dam below Garrison, but the re-regulating dam for Fort Randall would be at Gavin’s Point, near Yankton, and for Oahe at the Big Bend of the Missouri.

The Pick Plan split the Missouri River States Committee along regional lines. Prior to the plan’s submission to Congress, the Army Corps of Engineers and the Bureau of Reclamation had maintained a functional working relationship. The Pick Plan’s public disclosure in February 1944 destroyed that alliance and pitted the Reclamation Bureau and its upper basin constituency against the Corps and its lower basin supporters. MRSC Chairperson Merrill Q. Sharpe favored the Pick Plan because it was the first comprehensive dam building program for the Missouri River ever submitted to Congress. Although the plan favored navigation interests over irrigation, Sharpe considered it the best available and realized that South Dakota would benefit substantially from its implementation.

Sharpe sought to gain the support of the upper basin states for the Pick Plan. During congressional hearings on 16-17 February 1944, Sharpe urged cooperation between the various basin interests, presenting an insightful analysis of the problems and potentials of river development. He noted that the conflict between the irrigation and navigation interests was predicated on a perceived shortage of water and could be resolved through the construction of dams that could hold back enough water for both lower and upper basin needs. As he summed it up, “I think a complete answer for many years to come is found in the single word ‘storage’.” Sharpe concluded by warning that if sufficient storage did not solve the conflict, then the entire development plan would be threatened.

It seems to me that such a result [increasing reservoir water storage capacity] should be reached rather than letting any conflict of interests bring the matter to an impasse which will deprive the Missouri Valley and the nation of the multiple benefits to labor, agriculture, business, postwar adjustment, and other national objectives which require that the project get started now . . . [27]

Assurances of goodwill by the Army Corps of Engineers and Sharpe to build more storage into their Pick Plan were not enough to convince the Bureau of Reclamation and upper basin irrigationists that their interests would be satisfied. In May 1944 the Bureau of Reclamation responded with its own plan, which emphasized irrigation and hydroelectric power. This plan, known as the Sloan Plan after its author, William G. Sloan, a Bureau of Reclamation field agent stationed in Billings, Montana, called for the construction of dams on the main-stem of the Missouri River at Oahe (Pierre), Big Bend (30 miles north of Chamberlain), and Fort Randall (Lake Andes). The dams at Oahe and Fort Randall were to provide the necessary water storage to irrigate land in both North and South Dakota. The bulk of the land Sloan hoped to irrigate was located in eastern South Dakota in the James River Valley. The hydroelectricity produced by the three dams would pump stored water for irrigation while surplus electricity could be sold to recover the costs of the projects.

The submission of the Sloan Plan led Sharpe on a frantic effort to mend the split between the upper and lower basin states and between the Bureau of Reclamation and the Army Corps of Engineers in order to save a comprehensive, basin-wide development plan financed by the federal government. On 5 August 1944 Sharpe called the MRSC to Omaha, Nebraska, where upper and lower basin interests recognized the folly of attempting to develop the Missouri River without each other’s cooperation. If the two factions went their own separate ways, the development plan would be jeopardized by the resultant political and legal infighting. Congress would not authorize the construction of two programs in direct conflict with one another, so the upper basin states and the Bureau of Reclamation joined with the lower basin states
and the Army Corps of Engineers to create a revised river development plan that met the needs of all interested groups.29

At the Omaha meeting the MRSC passed a resolution that satisfied the demands of upper basin interests and made the Pick-Sloan compromise possible. Point five of the resolution stated,

That authorization of the Bureau of Reclamation plan now before Congress . . . is necessary to a comprehensive development of the Missouri River . . . We ask the President and the Congress of the United States to authorize and direct the United States Army Engineers and the United States Bureau of Reclamation to bring before Congress a coordinated plan . . .30

The MRSC then distributed this resolution throughout the executive and legislative branches of the federal government. The success of the compromise was contingent upon the site selection and design of multiple-purpose dams. The dams proposed by the Bureau of Reclamation in the Sloan Plan and by the Army Corps of Engineers in the Pick Plan were designed almost exclusively for their particular constituencies. If the compromise were to work and the off-reservation interest groups of the entire basin were to avoid legal haggling over the river's water, the plans of the Army Corps of Engineers and Bureau of Reclamation had to be altered, new dam sites chosen, each previously proposed dam redesigned, and reservoir water storage capacities increased. Only these alterations would insure continued congressional support for the development of the Missouri. All parties involved realized that disunity among the basin states would threaten congressional appropriations for the projects.31

LOCATING THE DAMS

A number of hurdles had to be overcome for the multiple-purpose dam concept to be successful in the Missouri Valley. First, proper sites had to be chosen for the construction of the dams. Second, the dams and reservoirs had to be designed in minute detail to insure that basin interests received the promised benefits. And third, the weather had to cooperate by producing enough rainfall to fill the reservoirs. The first two hurdles could be overcome with the proper application of science and technology, but no one controlled the weather, and this worried everyone. If the rains did not fall and drain into the Missouri Valley to be stored behind the dams, the political compromise that had created the Pick-Sloan Plan would crumble.

Site selection was dependent upon geology, cost-effectiveness, demographics, and political considerations. The geological character of the Missouri Valley limited the area of possible sites to the upper basin. From Fort Peck Dam in Montana to Yankton, South Dakota, the Missouri Valley is only one to five miles wide, but below Yankton, the valley widens dramatically, becoming an alluvial flood plain five to seventeen miles across, through which the river meanders great distances. Dams in the lower valley would be exorbitantly expensive because they required great amounts of earth fill, and they would be unsafe because subsurface mineral deposits are less stable over long stretches. Thus, the dam engineers focused their attention on the Missouri in North and South Dakota where the valley is narrow and relatively stable subsurface minerals exist.32

The Missouri Valley in South Dakota is underlain with deposits of Pierre shale and Niobrara chalk. Engineers deemed both of these subsurface minerals suitable for the placement of large earth-fill dams, but the depth of these minerals affected the cost of the dams. Since the dams had to be attached to the chalk or shale, digging down to deeper deposits would be more costly.33 Another geological consideration was the relation of the sites to tributaries of the Missouri River. The dams needed to capture all, or most, of the water entering the valley, because if a major tributary's water was not captured its flood
waters could wreak havoc on downstream urban centers and agricultural lands and possibly disrupt navigation. 34

Non-geological factors also affected the cost-effectiveness of the dam sites. Engineers had to consider the proximity of sites to available transportation facilities, since large pieces of machinery and equipment would have to be brought in by railroad and highway. For a site distant from a railhead or highway, the cost of constructing a road would have to be added to the cost of the dam itself. 35

The dams also had to be close to towns, housing, hospitals, and recreational facilities, as construction personnel needed food, clothing, shelter, medical care, and some place to spend their spare time. The Corps could not afford to construct these facilities at the site, so dams near cities or towns were preferable. 36

Engineers also considered the difficulty and cost of acquiring the lands needed for dam sites and reservoirs as well as the cost of relocating valley residents. Purchasing prime agricultural land, or expensive urban real estate, would have increased the overall cost of a dam's construction; therefore, "underutilized" or cheap, "low quality" Indian land was preferable. 37 Furthermore, moving a large off-reservation urban population—and railroad bridges, sewer facilities, buildings, and other property—would cost far more than moving residents of Indian reservations whose worldly possessions and homes had less market value. Since power was to be one of the products of
the dam, transmission lines carrying the hydroelectric power from the site to the available market needed to be as short as possible.

The biggest influence on site selection for the dams of Pick-Sloan, however, was the relation of the dams to off-reservation urban centers in the Dakotas. Each dam and reservoir had to spare the large urban centers while providing the reservoir storage capacity to meet the water demands of basin interest groups. The importance of the population centers to the site selection process was explicitly stated in the 1944-45 "Comprehensive Report on Missouri River Development":

In determining the location of the multiple-purpose reservoirs, consideration must be given to the existence of cities which might be wholly or partially inundated by these reservoirs, and the railroads and highways crossing the river in the reservoir areas. Larger cities in this category are Chamberlain, Pierre, and Mobridge in South Dakota, and Bismarck and Williston in North Dakota. Accordingly, the sites described in this report have been selected at such distances downstream from these cities that sufficient storage [in the reservoirs] will be provided without undue flooding of expensive real estate. . . . Thus the height to which Fort Randall Dam can be built is limited by Chamberlain and the railroad and highway crossings in that vicinity, while the proximity of the city of Pierre,
FIG. 5. Fort Randall Dam, c. 1950. In this photo, the embankment of the dam rises above the valley floor. After massive Euclid dump trucks deposited earth on the surface of the embankment, bulldozers and rollers compacted the material. The Corps of Engineers and the Missouri River States Committee limited the height of Fort Randall Dam to prevent excessive water damage to the town of Chamberlain, but these organizations did not reduce the dam's height to spare the Indian community of Fort Thompson, approximately 30 miles north, northwest of Chamberlain. Courtesy of the Missouri River Division, US Army Corps of Engineers, Omaha, Nebraska.

S. Dakota, to the upper reaches of the Fort Randall Reservoir precludes any further consideration for dams below Pierre.

The report continued,

One of the reasons for selecting the Garrison site was that it is above Bismarck. . . . The storage limit for Garrison reservoir was dictated by damages imposed at and in the vicinity of Williston, near the Montana border. 38

By October 1944 the Corps, the Bureau of Reclamation, and the MRSC had come to an agreement on the selection of dam sites on the Missouri River. There were to be five dams on the main-stem of the river. Four dams, Oahe, Big Bend, Fort Randall, and Gavin's Point, were to be built in South Dakota. The fifth, Garrison, was to be located in North Dakota. Engineers and politicians chose these dam sites because of their cost-effectiveness and topographical attributes. Most importantly, the five dams of the Pick-Sloan
Plan would minimize damage to off-reservation urban centers in the Dakotas while still providing the reservoir storage capacity to satisfy off-reservation demands for flood control, navigation, hydroelectricity, and irrigation.

SACRIFICING INDIAN LANDS

Indian lands and towns located along the Missouri River in the Dakotas and Nebraska did not receive the same degree of consideration in the site selection and design of Pick-Sloan's dams that off-reservation cities received. The Corps, the Bureau of Reclamation, and the MRSC were unwilling to change the sites of Pick-Sloan's dams or alter their reservoir storage capacities to spare Indian valley lands or towns. The reason was simple—any reduction in reservoir storage capacity to take into consideration Indian interests would mean a reduction in the cost-to-benefit ratio of the project. An unfavorable cost-to-benefit ratio increased the likelihood that Congress would not fund the project. Moreover, if
Indian interests in preserving their lands from inundation, or in developing the Missouri River for their own needs and wants, had been considered by the MRSC, Corps, and Bureau of Reclamation, off-reservation interests would have received fewer benefits from the dam projects and this in turn would have threatened the implementation of the Pick-Sloan Plan. A reduction in benefits to off-reservation interests might have led to the withdrawal of congressional support for the plan.

Excluded from the planning process, the Indians of North and South Dakota discovered that much of their land had been sacrificed to the Pick-Sloan dams in order to make the plan a reality. Without the reservoir water storage provided by the Indian reservation bottomlands, the Pick-Sloan compromise would not have been possible. Maximizing reservoir water storage capacity was the key to the compromise and only Indian lands could provide the water storage space. None of the planners recognized that the bottomlands were of irreplaceable economic value to the Indians, who could hunt and grow traditional crops on lands that were “useless” only from the point of view of technologically dependent commercial agriculture. Without the Indian bottomlands, dams and reservoirs on the main-stem of the Missouri would not have been as cost effective for non-reservation populations, which in turn would have threatened their sources of congressional funding. Engineering considerations were a factor in the site selection and design of Pick-Sloan dams, but political considerations, especially a concern for maintaining the Pick-Sloan compromise and sparing off-reservation urban centers, were the primary reasons the dams and reservoirs were designed to be so high and built at locations so disadvantageous to Indian interests.

NOTES


4. Ibid., p. 49; Department of the Interior, BIA, Missouri River Basin Investigations Project Report Number 165, Damage to Indians on the Crow Creek and Lower Brule Reservations from the Big Bend Dam and Reservoir Project (Billings: BIA, 1960), p. 4.


6. Readers interested in the various organizations involved in Missouri River development should examine the excellent collection of papers located at the Herman T. Pott National Inland Waterways Library, St. Louis Mercantile Library, 510 Locust Street, St. Louis, Missouri 63188.


12. Ibid., p. 404.


15. Hipple interview (note 13 above).
