



Development of Multiple-Purpose Water Planning by the Federal Government in the Missouri Basin

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Article Summary: After 1936 the Corps of Engineers created plans to protect against floods and to insure against drought conditions and low farm prices in the lower Missouri Valley. The Reclamation Bureau envisioned greater irrigation and power development in the upper valley. The Pick-Sloan Plan grew out of the combined efforts of the two agencies.

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DEVELOPMENT OF MULTIPLE- PURPOSE WATER PLANNING BY THE FEDERAL GOVERNMENT IN THE MISSOURI BASIN

BY THOMAS H. LANGEVIN

THE Missouri Valley program is a mammoth plan for the resource development of a river basin which covers an area of approximately 529,000 square miles, one-sixth of the United States. It is a program of utmost importance to Nebraskans, whose state is the only one of the ten Missouri Valley states which lies entirely within the region.

Nebraska is already profiting from aspects of the program and the promise of much greater benefits is a rich one. These benefits are multiple—often, though not always—from one project. It is with the concept of multiple-purpose water development which the Missouri Basin program is helping to more clearly define that this article is concerned.

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For nearly one hundred twenty years, the Federal Government has been concerned, in varying degrees, with the development of the Missouri River, or the water resources of its drainage basin. Under the present Missouri Basin development program, an inter-agency approach, the concept of multiple-purpose development, including flood control, navigation, irrigation, power, and other allied phases, has become firmly established. The use of specific projects or improvement features for multiple purposes has evolved slowly as a national policy, and the growth of the concept is reflected in the water development and planning carried on by the Federal Government in the Missouri Basin prior to World War II.¹

Because of the importance of water transportation, early improvement of the Missouri River was concerned with the stabilization of a channel for navigation. The first steamboat was taken on the river in 1819, and the same year three boats, under the command of Stephen H. Long, attempted a journey up the river. One of these, the *Western Engineer*, ascended the river as far north as Fort Lisa, five miles below Council Bluffs.² By 1831 there were five regular steamboats on the lower river; and in 1836 there were nearly twenty which made round trips from St. Louis to Glasgow and Boonville, Missouri. By 1842 there were thirty-six boats on the lower river.³

Despite the fact that railroads had been built to various points on the Missouri River prior to 1880, the peak of steamboat activity was reached in that year, during which the wharf master at St. Louis recorded three hundred thirty-two arrivals and departures. In the same year, forty-six steamboats arrived at Fort Benton on the upper reaches of the Missouri in western Montana. Through-navigation on the Missouri River soon disappeared, however, after the com-

¹ The development of the multiple-purpose concept as a national policy has been studied by Joseph Sirera Ransmeier, *The Tennessee Valley Authority. A Case Study in the Economics of Multiple-Purpose Stream Planning* (Nashville, 1942).

² Hiram Martin Chittenden, *History of Early Steamboat Navigation on the Missouri River* (New York, 1913), I, 90-1.

³ Phillip E. Chappell, *A History of the Missouri River* (Topeka, 1912), pp. 42-44.

pletion of a railroad to Fort Benton in the late 1880's. The last arrival of a steamboat at that point was only a few years later.⁴

It was the importance of the steamboat traffic which first caused the Federal Government to pursue activities on the Missouri River, where navigation was notoriously treacherous because of constantly shifting sandy channels, and obstructions such as trees and brush. In 1832, an act of Congress appropriated \$50,000, part of which was to be used to improve the navigation of the Missouri River.⁵ In 1838, further action was taken which provided for the removal of snags and obstructions and the maintenance of a channel for steamboating.⁶

For approximately forty years following the initial authorization in 1832, government appropriations to the Corps of Engineers were primarily used to combat the various dangers which the Big Muddy presented to navigation. Though snagboats were utilized to remove obstructions, snags pierced enough hulls on the Missouri to earn for the river the title of "the graveyard of steamboats."⁷

It was not until 1878 that Congress provided sufficient money to initiate navigation improvement work at various points along the Missouri River. At this time \$50,000 was appropriated with which to survey the river from Sioux City, Iowa, to its mouth, in the interest of providing an adequate channel for navigation.⁸ The appropriation made several years later, in 1881, was the fifth in a series totaling \$861,000 for more than forty works among projects in thirteen localities along the Missouri River.⁹

⁴ George C. Haydon, *The Missouri River and Its Improvement* (Kansas City, 1931), p. 7. (Mimeographed)

⁵ Law of July 3, 1832, 22nd Congress, 1st Session, *U.S. Statutes At Large*, IV, 552.

⁶ Law of July 7, 1838, 25th Congress, 2nd Session, *Ibid.*, V, 270.

⁷ Paul D. Berrigan, "Early Day Activities and Improvements on the Missouri River," *Minutes of the Fortieth Meeting of the Missouri Basin Inter-Agency Committee*, May 18, 1950, Appendix C, p. 2. (Mimeographed)

⁸ Law of June 18, 1878, 45th Congress, 2nd Session, *U.S. Congress Session Laws*, Ch. 264, 163.

⁹ Berrigan, *op. cit.*, C-2.

The period from 1877 to 1882 was the formative period in the development of procedures for navigation channel stabilization on the Missouri. Experimental work was pursued by a trial and error method, and through a process of elimination, various "standard" types of dikes and revetments evolved. This was the beginning of the construction of bank protective works and contraction or narrowing of the river in order to increase the depth of the channel. These principles were advocated by Major Charles R. Suter of the Corps of Engineers in 1881, when he presented to Congress the first comprehensive report on means of improving the Missouri in a systematic fashion.¹⁰

The first appropriation for such improvement was made in the following year, when the Suter Report was authorized by Congress.¹¹ In order to facilitate this program, the Missouri River Commission was created in July, 1884. This commission consisted of five members, three from the army and two civil engineers. It was established to "superintend and direct" the navigation improvements on the river. That improvement work was quite experimental is indicated by the fact that the act which created the commission directed that there should be an annual report on the systems of work which were devised. The act also appropriated \$125,000 to improve the upper Missouri River above Sioux City and granted \$15,000 with which to survey the area above Fort Benton.¹²

While the Missouri River Commission did not receive adequate funds to carry out very far-reaching improvements, it did, under the general plan of work recommended in the Suter Report, initiate various navigation works on the lower Missouri River from Kansas City to the mouth. Revetments were constructed on various troublesome "bends" and bank stabilization was initiated on the river between Jefferson City and the mouth.¹³

¹⁰ Haydon, *op. cit.*, pp. 14-15.

¹¹ Law of Aug. 2, 1882, 47th Congress, 1st Session, *U.S. Congress Session Laws*, Ch. 375, 205.

¹² Law of July 5, 1884, 48th Congress, 1st Session, *Ibid.*, Ch. 228, 144-5.

¹³ Haydon, *op. cit.*, p. 15.

However, appropriations in the early years were shaped much more by politics than by any consideration of costs and benefits. In order to try to remedy this, Congress, in 1902, while abolishing the Missouri River Commission, established a Board of Engineers for Rivers and Harbors in the office of the Chief of Army Engineers, to which all river reports, surveys, and examinations were to be submitted for review.¹⁴

Under control of the Corps of Engineers, work on the Missouri River was practically dormant during the period between 1902 and 1910, for not even enough funds were provided to maintain works already installed by the Missouri River Commission.¹⁵

While this early period was characterized by an emphasis upon work only for navigation improvement, it should be recognized that after the turn of the century it became apparent that various river works, including levees, while constructed under appropriations made only in the name of navigation, actually had a direct bearing on the control of floods. During the early years of this century, then, navigation works actually were constructed with an incidental flood control purpose.¹⁶ It is under this multiple-purpose concept of navigation and incidental flood control that one must consider the various navigation projects which have been pursued on the Missouri River since 1912, when a six-foot channel was authorized from Kansas City to the mouth of the river, near St. Louis.¹⁷

A trend toward multiple-purpose water development was also noticeable early in the twentieth century when the National Conservation Commission established by President Theodore Roosevelt in 1908 to investigate resource problems said, "All uses of the waters and all portions of each waterway should be treated as interrelated."¹⁸

¹⁴ Ransmeier, *op. cit.*, p. 6.

¹⁵ Haydon, *op. cit.*, p. 16.

¹⁶ Ransmeier, *op. cit.*, p. 10.

¹⁷ Public Law 241, 62nd Congress, 2nd Session, *U.S. Statutes At Large*, XXXVII, Pt. 1, 219. In 1927, this project was extended by congressional authorization to Sioux City, Iowa. Public Law 560, 69th Congress, 2nd Session, *Ibid.*, XLIV, Pt. 2, 1013.

¹⁸ Quoted in Ransmeier, *op. cit.*, p. 14.

The Federal Water Power Act of 1920, while it had deficiencies with respect to such conservationist views, was designed to protect the spoilation of sites where navigable stream development was possible, and was an advancement of the principle of multiple-purpose water development. No funds, however, were provided for the Federal Power Commission to initiate the comprehensive river investigations which the act of 1920 authorized.¹⁹

The recognition of the position of power development, however, was more fully indicated in 1925, when Congress directed the Corps of Engineers and the Federal Power Commission to prepare estimates of the cost of multiple-purpose development of navigable streams in the United States. The report was to indicate all navigable streams upon which power development appeared to be feasible,

. . . with a view to the formulation of general plans for the most effective improvement of such streams for the purposes of navigation, and the prosecution of such improvement in combination with the most efficient development of the potential water power, the control of floods, and the needs of irrigation.²⁰

In accordance with this authorization, a report which gave an estimate of the cost of such surveys of the Missouri River and its tributaries was submitted in April, 1926.²¹ The estimate included the upper as well as the lower Missouri Basin, and called for investigations dealing with flood control and other possible utilization of water resources, with emphasis on the relation of the use of water for irrigation and navigation.²²

In the Rivers and Harbors Act of 1927, Congress authorized this report as a basis for further investigations and plans and directed the Secretary of War to make surveys of the Missouri River and its tributaries. Designs for improvement were to include flood control, navigation, irrigation and

¹⁹ *Ibid.*, p. 17.

²⁰ Public Law 585, 78th Congress, 2nd Session, *U.S. Statutes At Large*, XLIII, Pt. 1, 1190.

²¹ *House Document 308*, 69th Congress, 1st Session.

²² *Ibid.*, pp. 2-6. The report gave estimates for the examination of navigable streams throughout the United States.

power development, as well as other related water uses.²³

For the next five years the Corps of Engineers, working under this authorization, made an exhaustive study of improvement possibilities. The various reports of these surveys were all included in a document which was huge in its scope.²⁴ This Army report was presented in September, 1933, by Maj. Gen. Lytle Brown, then Chief of Engineers. It included surveys of the Missouri River itself and its twenty-three major tributaries, and provided for multiple-purpose development plans. The report proposed the construction of levees and channel improvements on the upper and lower Missouri River to afford flood protection to thirteen towns and cities.²⁵ While a system of reservoirs was considered for the alleviation of floods in the Missouri Basin, the division engineer did not propose them because it was felt they were not economically justifiable.²⁶ A system of seven reservoirs was proposed, however, for the lower Missouri Basin, to alleviate floods on the lower Mississippi River.²⁷

With respect to irrigation the comprehensive plan mentioned a possibility of eighty reservoir projects. Of these, it was stated that over forty, which would irrigate more than 2,000,000 acres of land, appeared to be feasible for federal development. A total of thirty-six hydroelectric projects was mentioned, involving the construction of nearly eighty power plants with a combined capacity of 2,767,000 kilowatts. Among these was the Fort Peck project in Montana.²⁸ It was proposed that the existing navigation project should be continued, but because the feasibility of a six-foot channel was questioned, it was stated that:

... further new works will be limited to those necessary to reasonably assure the integrity of such works as are already completed or underway, to maintenance

²³ Public Law 560, 69th Congress, 2nd Session, Sec. 1, *U.S. Statutes At Large*, XLIV, Pt. 2, 1013.

²⁴ *House Document 238*, 73rd Congress, 2nd Session, Feb., 1934. This is known as the Missouri River "308 Report." The report is over 1,200 pages in length, excluding a large collection of maps and charts.

²⁵ *Ibid.*, p. 2.

²⁶ *Ibid.*

²⁷ *Ibid.*, p. 13.

²⁸ *Ibid.*

of existing works and to such snagging, dredging, and channel marking as may be found necessary to facilitate navigation that might use the river under prevailing conditions.²⁹

In considering the voluminous report, the Board of Engineers for Rivers and Harbors agreed that the plan was comprehensive and "adequate. . . as a general guide for the conservation of the water resources of the Missouri Basin, and for future developments for navigation, flood control, power development, and irrigation." But specifically, for the present, the board felt flood protection for cities was a local concern, that the reservoir systems were not economically feasible, that some of the irrigation projects were probably suitable, that federal participation in power developments was not justifiable, and that only existing navigation projects should be continued.³⁰

The attitude of the Army, in general, was that the formulated development plans were adequate for future action "as economic conditions may warrant."³¹ While the "308 report" was the major study upon which subsequent Missouri Basin water development plans were based, it was noticeable that the general attitude upon its presentation was that multiple-purpose development to any extent was not feasible at that time. Especially noticeable was the emphasis placed upon the fact that flood control remained somewhat a local problem, and not within the sphere of federal activity.

However, it should be emphasized that this was at the time when the TVA was being initiated, which gave increasing influence toward a more adequate fulfillment of multiple-purpose use of water resources. Senator Norris, the great TVA exponent, was at this time also thinking of a fuller use of the water resources of the Missouri Basin. Early in 1934, he presented a bill which envisioned a development scheme for the region not unlike that outlined by the "308 report" in its purposes. It provided for improving the navigability of the Missouri River, for flood control, reforestation, irriga-

²⁹ *Ibid.*, p. 16.

³⁰ *Ibid.*, pp. 17-21.

³¹ *Ibid.*, p. 12.



Work on the Missouri River Near Omaha, About 1926
(Louis R. Bostwick photo.)

tion development, and the production of electric power.³²

During the period after the Mississippi flood of 1927, it became increasingly recognized that flood control policy should be revised so as to provide for more than a reliance upon benefits merely incidental to navigation. This idea was expanded and put into action after the nation-wide floods of 1935 and the flood on the Ohio River in 1936³³. The Flood Control Act of 1936 was the first declaration of the congressional policy that floods were to be considered a national problem. Under this act, flood control was made the responsibility of the Corps of Engineers of the United States Army and of the Secretary of Agriculture. The Corps of Engineers was to be responsible for surveys and proposals concerning flood control on the main stream, including, in general, various phases of water run-off retardation.³⁴

That flood control was not to be carried on under a single-purpose policy is indicated by the 1936 act, which, in placing flood control on navigable waters chiefly in the hands of the Corps of Engineers, stated that flood control was "... for the benefit of navigation and the control of destructive flood waters and other purposes. . . ." More specifically, the act provided:

. . . that penstocks or other similar facilities, adapted to possible future use in the development of adequate electric power may be installed in any dam herein authorized when approved by the Secretary of War upon the recommendation of the Chief of Engineers.³⁵

The Flood Control Act of 1936, however, authorized no dams in the Missouri Basin. Rather, it approved levees and flood walls on the Kansas and Missouri Rivers at Kansas City, and channel improvement for flood control in the vicinity of Council Bluffs, Iowa.³⁶ It is apparent that the interrelationship of flood control and navigation improvement was recognized. In addition, the 1936 act authorized

³² *Congressional Record*, LXXVIII, Pt. 1, 56.

³³ Ransmeier, *op. cit.*, pp. 21, 23.

³⁴ Public Law 738, 74th Congress, 2nd Session, Sec. 1 and 2, *U.S. Statutes At Large*, XLIX, Pt. 1, 1570.

³⁵ *Ibid.*, p. 1572.

³⁶ *Ibid.*, p. 1588.

the Corps of Engineers and the Department of Agriculture to make preliminary river and watershed surveys and investigations at various localities, including the Republican River in Nebraska, the Smoky Hill River in Kansas, and others.³⁷ Other preliminary investigations and surveys were authorized in the flood control act of the following year for the Platte River in the vicinity of Schuyler, Nebraska, the Little Osage River in Kansas, and the Yellowstone River in Montana. In this act flood control was more closely integrated with navigation.³⁸

The association of these water development phases with the production of power was more closely achieved in 1938, when another flood control act specified approval of producing power at flood control dams not only upon the recommendation of the Chief of Engineers, but also upon that of the Federal Power Commission.³⁹ Also, in addition to further authorization granted to the Corps of Engineers and the Department of Agriculture for flood control surveys, the 1938 act authorized the Federal Power Commission to carry out examinations and surveys of power potentialities at Army projects and authorized \$1,500,000 for that purpose.⁴⁰

The flood control program in the Missouri Basin was further extended in 1938, when Congress authorized \$9,000,000 for the construction of reservoirs in the area, these to be "selected and approved by the Chief of Engineers" on the basis of a "comprehensive plan" which had been presented in 1937.⁴¹ Actually, construction on only one of these reservoirs was initiated prior to World War II, that being the Kanapolis Dam on the Smoky Hill River in central Kansas. Construction, however, was deferred after the beginning of the war, in order to conserve manpower and materials.⁴²

In 1941, Congress extended the authorization of the Army's "comprehensive plan" by an additional \$7,000,000,

³⁷ *Ibid.*, pp. 1592-4.

³⁸ Public Law 406, 75th Congress, 1st Session, Sec. 5, *U.S. Statutes At Large*, L, Pt. 1, 877, 878.

³⁹ Public Law 761, 75th Congress, 3rd Session, Sec. 4, *Ibid.*, LII, 1216.

⁴⁰ *Ibid.* p. 1224.

⁴¹ *Ibid.*, p. 1218.

⁴² *House Document 475*, 78th Congress, 2nd Session, p. 22.

and specifically approved the construction of the Harlan County Dam on the Republican River in Nebraska, the Cherry Creek project near Denver, and the initiation of a flood protection scheme along the banks of the Missouri River between Sioux City, Iowa and Kansas City.⁴³ At the time of the entry of the United States into World War II, authorization had been given for the construction of ten flood control dams in the Missouri Basin, although work had been initiated only on the Kanapolis project.⁴⁴ This does not include the huge Fort Peck project in Montana which was already completed at this time.

The Fort Peck project in itself offers a study in the growth of multiple-purpose water development policy in the Missouri Basin during the decade prior to the entrance of the United States into World War II. In 1933, at the time the Army was about to present the basic "308 report" on the Missouri Basin, calling for the construction of Fort Peck Dam as an aid to navigation by means of regulating channel flows, various senators from the Missouri Basin states announced they were planning to urge President Roosevelt to recommend this reservoir as a public works project. They felt there might be undue delay if it were dependent upon specific congressional appropriations for the Army.⁴⁵ Consequently, the President told Senator Bennett Champ Clark of Missouri he might feel assured that the entire Missouri River project would be carried out, including Fort Peck Reservoir, but that it would be possible to allocate at the present time only such funds as could be used during the next year.⁴⁶

Construction of the Fort Peck Dam was begun in the early spring, 1934, simultaneously with the Bonneville and Grand Coulee projects. On July 13, 1934, Secretary of the Interior Ickes granted \$25,000,000 of P.W.A. funds to carry on the work at Fort Peck, including purposes of irrigation and flood control in addition to navigation.⁴⁷ President Roosevelt, in a

⁴³ Public Law 228, 77th Congress, 1st Session, *U.S. Statutes At Large*, LV, Pt. 1, 646-7.

⁴⁴ House Document 475, *op. cit.*, p. 30.

⁴⁵ *New York Times*, October 3, 1933, I, 42:2.

⁴⁶ *Ibid.*, I, 33:1.

⁴⁷ *Ibid.*, July 13, 1934, I, 17.

speech at Fort Peck on August 6, 1934, emphasized the importance of the project as an aid to navigation, but he also gave emphasis to its value in being able to provide irrigation water for 85,000 acres of land downstream from the dam. He said that the Missouri River work, of which Fort Peck was only the beginning, would be carried to completion, and that the project was one national in scope.⁴⁸ Fort Peck was, of course, part of the New Deal program for federal dams, which by 1936, included proposals for the completion of thirty-seven such structures, including Grand Coulee, Bonneville, Boulder, Norris, and other TVA projects.⁴⁹

The Fort Peck project went forward under PWA auspices until 1935, when it was authorized as an aid to navigation by Congress.⁵⁰ After this time, until the substantial completion of the Fort Peck project in 1939, there was much discussion throughout the Missouri Valley concerning whether or not multiple-purpose benefit could be expected from it. The *Kansas City Journal*, in an editorial entitled "Missouri River Follies" went so far as to condemn the whole Fort Peck project as worthless, authorized merely because of pressure from waterway advocates. It recommended "... confining river work to scientific flood control. In these troubled times," the article continued, "a little humor now and then is welcome, but in this case of river navigation the comedy comes at too high a price."⁵¹

While the flood control benefits of Fort Peck had been publicized and while the Army had vaguely mentioned irrigation benefits, by 1937 there was no specific provision in Army plans for the production of power. Nevertheless, the possible generation of power consistent with the primary purpose of navigation had been discussed in the Army's "308 report."⁵² The possibility of power production at Fort Peck, however, was being discussed as work on the project progressed. In January, 1937, for example, Representative

⁴⁸ *Ibid.*, August 7, 1934, I, 11:3.

⁴⁹ *Ibid.*, February 23, 1936, IV, 4.

⁵⁰ Public Law 409, 74th Congress, 1st Session, *U.S. Statutes At Large*, XLIX, Pt. 1, 1034.

⁵¹ Quoted in *Congressional Record*, LXXXV, Pt. 2, A-498.

⁵² House Document 238, *op. cit.*, pp. 174 ff.

James F. O'Connor of Montana introduced a bill in the House of Representatives which called for the creation of a Fort Peck Power Authority to provide for the generation, distribution, and sale of electricity.⁵³

The Fort Peck Act of 1938 provided for the construction of power generating facilities at the project. The law stated that:

The Secretary of War shall provide, . . . operate, maintain, and improve at Fort Peck project such . . . facilities for the generation of electric energy as the Bureau (of Reclamation) may deem necessary.

Surplus power, consistent with requirements for navigation, was to be delivered to the Bureau of Reclamation for distribution.⁵⁴ No power was produced prior to the war at Fort Peck. During the war, however, in 1943, a 35,000 kilowatt generator was placed in operation.⁵⁵

While prior to the war, therefore, Fort Peck was regarded as a project to support navigation on the Missouri River, various other development purposes had by that time become associated with it. It became increasingly apparent, especially during the 1930's, that the water development phases of navigation, flood control and power were interrelated. A similar growth of multiple-purpose consciousness was evident in the field of irrigation.

Just as flood control early proved itself a "natural" incident to the construction of navigation levees, so the generation of power soon proved itself an economical incident to the storage of water for irrigation. Further, it soon appeared that the disposal of surplus water supplies to neighboring communities suffering from water deficiencies was also an appropriate function of a public irrigation improvement.⁵⁶

The recognition of this fact has evolved over the period since the entry of the Federal Government into the field of

⁵³ H.R. 3908, 75th Congress, 1st Session, *Congressional Record*, LXXXI, Pt. 1, 542.

⁵⁴ Public Law 529, 75th Congress, 3rd Session, *U.S. Statutes At Large*, LII, 403-7.

⁵⁵ *Minutes of the Forty-Third Meeting of the Missouri Basin Inter-Agency Committee*, August 24, 1950, G-6. (Mimeographed)

⁵⁶ Ransmeier, *op. cit.*, p. 25.

irrigation, which followed the earlier periods of irrigation development by private enterprise and state "superintendence" of irrigation.⁵⁷ The Federal Government's activities in the field of irrigation were inaugurated with the Reclamation Law of 1902. This act, which instituted the "reclamation fund," introduced the principles of repayment for irrigation development, and authorized the Secretary of Interior, "to make examinations and surveys for, and to locate and construct . . . irrigation works for the storage, diversion, and development of waters" in seventeen western states.⁵⁸

While this original reclamation act specified only single-purpose projects, it soon became apparent that the generation of hydro-electric power, where feasible, would further the objectives of the reclamation policy. Consequently, in 1906, it was provided that whenever the production of power was:

Necessary for the irrigation of lands under any project undertaken . . . or the opportunity is afforded for the development of power . . . the Secretary of the Interior is authorized to lease . . . giving preference to municipal purposes, any surplus power or power privileges.⁵⁹

Pt. 1, 117.

Furthermore, the act recognized the importance of the incidental sale of surplus water at projects to towns, the proceeds of which was to go into the reclamation fund.⁶⁰

Further provision for the sale of surplus water was made in 1911, when the Secretary of the Interior was authorized to sell water to lands already being irrigated as a result of activities outside the scope of the Reclamation Service.⁶¹ This delivery of supplemental water supplies to irrigation districts, associations, and individuals greatly expanded

⁵⁷ Dorothy Lampen, *Economic and Social Aspects of Federal Reclamation* (Baltimore, 1930), pp. 20-48. The author places the history of irrigation legislation into three periods. These are: the period of development by private enterprise, the period of state control, and the period of federal reclamation.

⁵⁸ Public Law 161, 57th Congress, 1st Session, *U.S. Statutes At Large*, XXXII, Pt. 1, 388.

⁵⁹ Public Law 103, 59th Congress, 1st Session, *Ibid.*, XXXIV, ⁶⁰ *Ibid.*, pp. 116-7.

⁶¹ Public Law 406, 61st Congress, 3rd Session, *Ibid.*, XXXVI, Pt. 1, 925.

the federal reclamation activities. It made for the stabilization of areas already being irrigated, but insecure because of lack of reliable water supplies.⁶²

While provision for the sale of surplus power and water to enlarge the reclamation fund was therefore made in the early years after the Reclamation Act of 1902, these features remained in a relatively minor position. The early construction of power plants, under the act of 1906, was carried on with the sole purpose of producing power necessary for the construction of projects. This was true, for example, in the Salt River Valley project in Arizona, which was initiated in 1906.⁶³

However, as federal reclamation projects became larger and more complex, it was necessary to produce power to run pumps needed for irrigation and drainage. Power plants became integral parts of irrigation projects.⁶⁴ The concept of multiple-purpose irrigation projects was broadened as the work of the Reclamation Bureau increased, and in 1928, as a result of the growing consciousness of full utilization of water resources, the first multiple-purpose irrigation development was authorized, that being the Boulder Canyon project.⁶⁵

The act which provided for the construction of this huge dam on the Colorado River specifically defined the uses of the structure and its reservoir as being for the improvement of navigation, river regulation, irrigation, flood control, domestic water supplies, and the production of power.⁶⁶

Perhaps because of the influence of the planning of the Boulder Canyon project, the Reclamation Bureau, during the 1920's, came to think of comprehensive or multiple-purpose development in other areas. While various recommendations for such development were not well received by the Coolidge and Hoover administrations, some were approved during the

⁶² *Senate Document No. 36, 76th Congress, 1st Session, "National Irrigation Policy. Its Development and Significance,"* p. 10.

⁶³ John C. Page, "The Place of Hydroelectric Power in Reclamation," *The Reclamation Era*, XXX, No. 6, 157.

⁶⁴ *Ibid.*

⁶⁵ Public Law 642, 70th Congress, 2nd Session, *U.S. Statutes At Large*, XLV, Pt. 1, 1057.

⁶⁶ *Ibid.*, p. 1061.

1930's. Among them was the Kendrick project north of Casper, Wyoming, and the huge Colorado-Big Thompson project north and west of Denver.⁶⁷

The concept of multiple-purpose planning for irrigation projects, which had been quite well defined by the late 1930's, was reflected in the Reclamation Act of 1939.⁶⁸ This law fully recognized the multiple-purpose basis for irrigation construction. In making estimates for irrigation projects, the act specified that the Secretary of the Interior must consider, in addition to "engineering feasibility" and cost of "proposed construction,"

The part of the estimated cost which can be properly allocated to irrigation and probably be repaid by the water users; the part of the estimated cost which can properly be allocated to power and probably be returned to the United States in net power revenues; (and) the part of the estimated cost which can properly be allocated to municipal water supply or other miscellaneous purposes and probably be returned to the United States.⁶⁹

Further, in defining the principles of multiple-purpose cost allocation, the act stated:

If the proposed construction is found by the Secretary to have engineering feasibility and if the repayable and returnable allocations to irrigation, power, and municipal water supply . . . found to be proper, together with any allocation to flood control or navigation . . . equal the total estimated cost of construction . . . then the new project . . . shall be deemed authorized.⁷⁰

It was under such a guiding concept that investigations of the Reclamation Bureau were initiated on a widespread scale in the Missouri Basin.⁷¹ In the mid-1930's some second-

⁶⁷ Ransmeier, *op. cit.*, p. 27.

⁶⁸ Public Law 260, 76th Congress, 1st Session, *U.S. Statutes At Large*, LIII, Pt. 2, 1187.

⁶⁹ *Ibid.*, pp. 1193-4.

⁷⁰ *Ibid.*, p. 1194.

⁷¹ There were, by 1939, a number of large irrigation projects in the Missouri Basin, among them the North Platte project in Nebraska and Wyoming and the Milk River project in Montana, both among the first federal reclamation projects, authorized in 1903. In 1938, federal reclamation projects in operation in the Missouri Basin were the Huntley, Milk River, and Sun River projects in Montana; The Lower Yellowstone project in Montana and North Dakota; the North Platte project in Nebraska and Wyoming; the Belle Fourche project in South Dakota; and the Riverton and

ary investigations were being conducted in the area by the Bureau of Reclamation, including, for example, surveys on the lower Platte River in Nebraska.⁷²

In 1937, such investigations were accelerated with additional appropriations granted by Congress, and with Public Works and Emergency Relief appropriations, as well as funds contributed by western states. This acceleration was, of course, directly related to the drought conditions in many localities of the west.⁷³ As President Roosevelt stated it:

The tragic drought of 1936 has re-emphasized the importance to the welfare of the Nation of conserving the waters of our western streams for use in stabilizing agriculture and strengthening the economic structure of the arid and semiarid regions.⁷⁴

The investigations which were accelerated included preliminary reconnaissance surveys, topographic surveys, geological examinations, land classification, silt surveys, stream measurements, mappings, the formation of preliminary designs of dams and other activities.⁷⁵ By 1938, Reclamation Bureau activities in the Missouri Basin included preliminary surveys of the proposed Bostwick and Mirage Flats projects in Nebraska, the Shadehill, Rapid Valley, Angostura and Gavins Point projects in South Dakota, and others.⁷⁶

These various investigations, carried on toward the end of the drought period, were called forth by the people of the Missouri Basin. These years saw the presentation in Congress of various resolutions by legislatures of some of the Missouri Valley states urging the authorization of dams and reservoirs. The legislature of North Dakota, for example, submitted, in 1935, a petition for a dam on the Missouri River at Big Bend between Mannhaven and Garrison to

Shoshone projects in Wyoming. Among the projects under construction in the Missouri Basin at this time were the Colorado-Big Thompson project in Colorado and the Kendrick and Shoshone projects in Wyoming. (While the Colorado-Big Thompson project is not entirely in the Missouri Basin, it can hardly be detached from it.) Senate Document No. 36, *op. cit.*, p. 40.

⁷² *Annual Report of the Secretary of the Interior, 1936*, pp. 78-9.

⁷³ *Annual Report of the Secretary of the Interior, 1937*, p. 21.

⁷⁴ Quoted in Senate Document No. 36, *op. cit.*, p. 37.

⁷⁵ *Annual Report of the Secretary of the Interior, 1937*, *op. cit.*

⁷⁶ *Annual Report of the Secretary of the Interior, 1938*, pp. 72-3.

impound water for the prevention of floods, storage of water for drought conditions, and as an opportunity for the employment of several thousand people.⁷⁷

In 1938, Mr. Harrington, a representative from South Dakota, submitted a resolution for the construction of the proposed dam at Gavins Point, near Yankton, South Dakota, primarily as an irrigation project, but also to provide for the production of hydroelectric power, to aid in the control of floods, improve navigation, and for other purposes.⁷⁸

It is worthy of note that these resolutions emphasized multiple-purpose water development projects. The years from 1935 to 1941 also reflect the increasing conviction that water utilization plans in the Missouri Valley, to be effective, should transcend state lines. Bills submitted to Congress during this period reflect this trend of thought. An indication of this was a bill presented in 1935 which provided for flood control, reforestation, power for industrial and agricultural advancement, and navigation improvement on the Missouri River.⁷⁹ Among other more inclusive measures was one in 1939, which envisioned a comprehensive water development scheme for the whole Missouri Basin.⁸⁰

By the late 1930's the various aspects of an overall water improvement program for the Missouri River Basin seemed to have been quite specifically defined. In the region as a whole, factors under consideration included a greater emphasis upon flood control, irrigation, soil erosion control, navigation improvement, power development, reforestation, the development of recreational facilities, programs for river silt abatement, improvement of municipal water supplies and sanitation facilities, and other minor features. Quite naturally, these various aspects did not receive uniform consideration throughout the vast Missouri Basin, for localities, of course, rated the various phases in an order of importance in keeping with their own most pressing needs. Of the phases of development mentioned, it has been indicated that the consideration of flood control and irrigation came force-

⁷⁷ *Congressional Record*, LXXVII, Pt. 6, 5285.

⁷⁸ *Ibid.*, LXXXIII, Pt. 1, 303.

⁷⁹ H.R. 4241, 74th Congress, 1st Session, *Ibid.*, LXXIX, Pt. 14, 676.

⁸⁰ H.R. 799, 76th Congress, 1st Session, *Ibid.*, LXXXV, Pt. 15, 31.

fully to the foreground. Soil erosion and conservation programs were subjected to a position quite below those aspects which reflected an immediate felt need.

While the Department of Agriculture had been authorized to pursue upland flood control activities, it received no special appropriations for such work in the Missouri Basin, as did the Corps of Engineers after 1936. It should be emphasized that the Army, with a background of surveys embodied in the "308 report," was necessarily able to project itself more quickly into the flood control picture than the Department of Agriculture.⁸¹

The Army Corps of Engineers and the Reclamation Bureau were, after 1936, engaged in specific accelerated programs in the Missouri Basin. These activities had been called forth by the need for protection against floods on the one hand, and a desire for an insurance against drought conditions and low farm prices on the other. The plans of both agencies were geared to a quite advanced multiple-purpose water development concept. The plans of the Corps of Engineers entailed flood control and navigation improvement in the lower Missouri Valley, as well as a consideration of irrigation, power development, and other water uses on the upper or western tributaries of the Missouri River. The plans of the Reclamation Bureau envisioned greater irrigation and power development in the upper valley, as well as flood control, navigation improvement, and other water uses on the lower Missouri River and its tributaries. Together these plans provided the basis of the much-publicized Pick-Sloan Plan, which, in turn, became the nucleus of the post-war Missouri Basin development program.

⁸¹ Personal Interview with Mr. Gladwin Young of the U.S. Department of Agriculture, Lincoln, Nebraska, March 15, 1948.