

W. L. Fernald

NORTH DAKOTA
STATE PLANNING BOARD

SUMMARY REPORT

OF

A PLAN OF WATER CONSERVATION

FOR

NORTH DAKOTA

VOLUME 4

MISSOURI RIVER AND MINOR TRIBUTARIES
DRAINAGE BASIN

JANUARY 1, 1937



TD201.N9 NOR

NORTH DAKOTA STATE PLANNING BOARD

H.E. Simpson, Grand Forks	H. L. Walster, Fargo	
M.O. Ryan, Fargo	Victor Freeman, Bottineau	
E.A. Willson, Bismarck	L.O. Harrington, Grand Forks	
H.M. Pippin, Halliday	J.P. Cain, Dickinson	
E.D. Lum, Wahpeton	Fred Vosper, Neche	
	Irvin Lavine, Consultant,	Grand Forks

WATER STUDY STAFF

Irvin Lavine, Director
 Charles F. Hobbs, Assistant
 Oscar Becker, Assistant

ENGINEERING	GEOLOGY & GEOGRAPHY	DRAFTSMEN	ECONOMICS
Charles F. Hobbs	Fredric Voedisch	Oscar Anderson	Leibel Bergman
Oscar Becker	Frank Foley	Merrill Grady	Eliz. Goodnow
E.J. Thomas	Sydney Scheldrup	Kenneth Joslin	Harry Anderson
E.F. Chandler	John Peterson	Lloyd Eng	
M.D. Hollis	E.P. Tynor	Emmet Judge	

COOPERATING AGENCIES ^{1/}

Works Progress Administration. This report was prepared and published under W.P.A. Sponsored Federal Project, No. 3, O.P. No. 265-6905.

U.S. Biological Survey	U.S. Geological Survey
Soil Conservation Service	National Resources Committee
North Dakota State Geological Survey	Engineering College, Univ. of N.Dak.
Agricultural Dept., N. Dak. Agric. College	Resettlement Administration
State Department of Health	State Engineer

North Dakota County Planning Boards

1/

The Cooperating Agencies are not responsible for the opinions, conclusions, or recommendations of the State Planning Board as expressed in this report.

MAIN STEM MISSOURI RIVER BASIN

GENERAL

The Missouri River is formed by the junction of the Jefferson, Madison, and Gallatin Rivers at Three Forks in southwestern Montana. It flows in a general southeasterly direction to its confluence with the Mississippi River about 15 miles above St. Louis, Missouri. It enters North Dakota about 70 miles south of the northwest corner of the state at a point 20 miles west of Williston. The general course is southeastward in a winding channel to a point approximately 50 miles west of the geographical center of the state. It then makes an abrupt turn and flows more directly south to the point where it leaves North Dakota and enters South Dakota at almost the exact center of the state line.

DRAINAGE AREA

The total Missouri River drainage area in North Dakota is 40,832 square miles. Of this 23,796 square miles is covered in the separate reports for the James, Knife, Heart, Cannonball, Little Missouri, Grand, and Yellowstone Basins. The Main Stem Missouri River Basin, as treated in this report comprises an area of 17,036 square miles.

POPULATION

The total population of the Basin in 1930 was 130,610. 39,005 persons resided in incorporated cities and villages. There are 16 towns of over 500 population. Bismarck with 11,090 is the largest and Williston with 5,106 is second. Next in size is Linton with 1,192.

FEDERAL AID

During the month of peak load, March 1935, 58,208 persons or 44.6% of the total Basin population were receiving federal aid. The state average for the same month was 31.6%. In the peak month of W.P.A. employment 3,699 were employed on work projects in or near cities and villages and 11,873 persons were employed in more rural areas, making a total of 15,572 persons employed in October, 1936.

TRIBUTARIES

The principal tributaries of the Missouri River to be treated in this report are the Little Muddy Creek, with a drainage area of 1,310 square miles, and Beaver Creek (Southeast of Bismarck) with a drainage area of 1,960 square miles. Although Apple Creek has a drainage area of 3,020 square miles, a large portion of this lies in the morainal lake area and consequently the run-off is very low. There are a number of tributaries of lesser importance. Most of these are on the northeast side of the Missouri River.

PHYSICAL
CHARACTER-
ISTICS

The Missouri River is a typical alluvial stream, characterized by instability of channel, relatively steep and frequently changing banks, easily eroded bed and banks, and the transportation of an enormous quantity of suspended material and bed sediment. It flows through a flat valley 2 to 3 miles in width. The valley is generally divided into two benches. One bench is about 15 feet above normal water level. The second bench is 25 or 30 feet higher. The valley is bounded on both sides by steep bluffs, 200 to 600 feet in height, which are dissected by numerous streams and coulees thus forming the so called "breaks" of the Missouri River. North and east of the river the breaks merge into a broad expanse of rolling prairie leading to the Altamont Moraine. The moraine is a series of hills and depressions in an uneven belt from 5 to 30 miles in width, along the Missouri escarpment. Many of the depressions in the area form lakes most of which are dry at the present time. On the southwest side of the river the "breaks" lead to uplands considerably higher than the eastern territory. The valley bluffs are also steeper in this area.

NATURAL
RESOURCES

Much of the Basin is underlain with lignite coal which is mined commercially at a number of points. In some localities the strata of coal are sufficiently near the top of the ground to be removed by strip mining. In other areas tunnels in the sides of coulee banks are used for removing the coal. There are a few vertical shaft mines in the area. Gravel is another natural resource that is used extensively in the Basin. Sodium sulphate deposits in great quantities are found in the extreme northwest portion of the Basin, particularly near Grenora. Sodium sulphate is extensively used in the manufacture of paper. The deposits in North Dakota are ready for commercial development but at present cannot be profitably developed because of high freight rates to prospective points of use.

GROUND
WATER

Water supplies are obtained in valley bottoms at depths of from 10 to 25 feet. In the surrounding drift areas water is secured at slightly greater depths and the level in the wells is more subject to fluctuation. During drought years many of these wells become dry and others require deepening to furnish an adequate supply. The Fort Union strata has many springs. These yield abundant supplies to surrounding areas. Such springs are present in great numbers within 15 or 20 miles of the Missouri River. Deep wells to the Fox Hills sandstone in the lower one-third of the Basin yield water of variable quality. Most of the water from shallow wells in the Basin is good although some is brackish or is high in mineral content.

THE WATER
PROBLEM

The water problem in the Main Stem Missouri River Basin is primarily one of making use of part of the large amount of water carried through the area by the Missouri River. There is also a

need for reservoirs on the tributary streams and in the headwater areas for storing water for recreation, wildfowl conservation and irrigation. Many towns in the area are in need of improved water supply and sewage disposal facilities.

PRECIPITATION

The 20 year average annual precipitation for the Basin is 14.30 inches. The average during the growing season is 10.63 inches and varies from 13.05 inches at Ashley to 9.28 inches at Howard. On the basis that approximately 12 to 14 inches of rainfall during the growing season, are required to raise a fair crop in the area, it is apparent that during more than one-half the years there is a definite shortage of moisture for growing crops. Records show a crop failure 2 years out of each 5 year period. During drought years high priced feed must be shipped in to maintain foundation herds in the Basin. Even during normal periods this causes serious losses to the farmers. In recent years all available resources have been used to buy this feed and, in a great number of cases, federal aid has become a necessity. It is estimated that there are 300,000 acres of potentially irrigable land in the Missouri River bottom lands. 200,000 acres of this are on the lower bench and 100,000 are on the second bench. The irrigation of these bottom lands would permit the growing of sufficient feed in Basin to sustain basic herds in drought years.

RUN-OFF

The average annual run-off of the Missouri River at Bismarck is approximately 2 inches. However, the run-off considered in this report varies from 0.75 for the Little Heart River to 0.18 for Apple Creek and Big Beaver Creek. The average run-off for streams on the northeast side of the upper portion of the Basin is about 0.35 inches. The run-off varies greatly over the lengths of the different streams being high in the "breaks", medium in the prairie areas, and very low in the morainal lake areas. The run-off from the Missouri Slope is much higher than from the area across the river.

FLOODS

The tributaries considered in this report do not cause excessive flood damage. The Missouri River frequently floods over the lower bench causing some local damage. Such floods are usually due to ice jams rather than entirely due to excessive flow. Mandan has suffered the greatest damages in North Dakota due to Missouri River floods. This is estimated by the U. S. Army Engineers to be approximately \$5,000 per year. Mandan now has levee protection for all ordinary Missouri River floods. Flood control is not a primary problem in the Basin. The Fort Peck dam will not greatly alleviate the flood situation in North Dakota. It controls but one-third the drainage area tributary to the Missouri River above Mandan. As stated above, floods in North Dakota are usually caused by local ice jams rather than by excessive flow in the river. If the

flow were reduced sufficiently, however, these ice jams would not form. A large reservoir on the Yellowstone River or the Missouri River below the mouth of the Yellowstone would provide such flood control. The cost of a flood control reservoir would be entirely out of proportion to the benefit derived.

BIOLOGICAL SURVEY

The U. S. Bureau of Biological Survey under their easement program have constructed a number of dams in the Basin which serve to refill low or dry lakes and sloughs and make them available as waterfowl refuges and for recreational purposes. The largest of these projects is the Long Lake project in Burleigh County. Next in size and importance is the Lake Nettie project in McLean County which provides 1230 acre feet of storage. A number of smaller projects have been constructed or are under construction at the present time.

WILD LIFE

There is considerable wild life in the Basin. There are a number of deer in the "brooks" along the Missouri River. The Biological Survey projects will develop needed waterfowl refuges in the area.

RECREATION

There are many lakes in the morainal areas that are used as recreational spots during normal years. However, during recent years these have dried up and have become unfit for use. The program of the Biological Survey has resulted in the formation of a number of lakes suitable for recreational purposes. There is a need for additional recreational facilities in the Basin. Although the possible storage is usually not large, some excellent recreational reservoirs can be created by impounding the flow from large springs which are present in the regions near the river.

WATER POWER

There is no water power development on the Missouri River or its tributaries in North Dakota. Power could be developed by constructing large dams. The cost of dams would be excessive for such purposes. A study by the U. S. Army Engineers of possible power development in connection with a proposed series of dams for canalization of the Missouri River shows that the development of power on the Missouri River is uneconomical. The anticipated power needs of the Basin can be most economically satisfied by the construction of additional steam generating stations where needed. These stations would use the cheap fuels available to the Basin in the form of lignite coal and natural gas. In the case of larger irrigation projects the construction of individual generating stations for each project could probably be economically justified. However, it is expected that low power rates will be made by power companies because the irrigation load would tend to increase their load factor.

NAVIGATION

Some navigation is maintained on the Missouri River with flat bottomed boats. Loading facilities are available at Mandan, Price, Mandan Lake, Stanton and several other North Dakota points. The water in the river is sufficient for these boats except in years of extreme drought. The Fort Peck Dam in Montana is being built for the purpose of maintaining a minimum flow in the Missouri River at Yankton of 30,000 cubic feet per second, for the benefit of navigation in the lower river channel. The effect of maintaining 30,000 cubic feet, per second in the river at Yankton would be to make the river in North Dakota navigable during all open seasons for the flat bottomed boats. River navigation is so slight in North Dakota, however, that the benefit to navigation in North Dakota of such stream regulation will be extremely small.

The U. S. Army Engineers have made preliminary investigations relative to the maintenance of a six foot channel for navigation from the mouth of the Yellowstone River to Yankton, South Dakota by means of a series of 23 dams and locks. This is being further investigated at the present time. Soil borings are being made at several proposed dam sites along the river.

MISSOURI RIVER DIVERSION

In the Devils Lake report the Missouri River Diversion project is outlined and is proposed as a project for the benefit of the James, the Shyenne, the Lower Red, the Devils Lake, and the Mouse River Basins. This project would consist of diversion of approximately 1000 cubic feet per second from the Missouri River to these Basins by means of canals and tunnels at an estimated cost of \$30,000,000. The U. S. Army Engineers have recently been making surveys and investigations to determine the best method of diversion. The results of these investigations have not been published, but should become available within a short time. The project concerns the Missouri Basin in that 1000 cubic feet per second would be diverted without resulting in any inconvenience at any point along the Missouri River. In the event diversion was secured by a medium height dam benefits to the Basin would result from the impounding of several hundred thousand acre feet of water.

CHANNEL IMPROVEMENT

The Missouri River is subject to constant channel changing. Where towns are built close to the channel and where bridges cross the river, this situation requires close attention. The State Highway Department has spent approximately \$200,000 for revetment work west of Williston to protect the large highway bridge from this menace. Williston has suffered serious loss due to the constant changing of the river channel. Williston uses Missouri River water for municipal supply purposes. Great difficulty has been experienced in keeping the water

intake in the water. There is a need for additional revetment work at the city of Williston to provide for the maintenance of a constant channel past the city.

The constant changing of the river channel results in the cutting away of well developed farm lands and the building up of sand bars of no economical value. This condition is unfavorable for the construction of permanent pumping plants for irrigation. It is probable that some local revetment work would have to be done in the vicinity of proposed pumping plants.

DRAINAGE

Natural drainage is sufficient in the Basin to take care of spring run-off and that following heavy rains. There are no drainage systems in the Basin and there is no need for such development.

MUNICIPAL SUPPLY

There are a considerable number of towns in the Basin having an inadequate supply of water. In most cases it would be relatively easy to secure an adequate supply, by the deepening of wells or the digging of new wells in more favorable locations. Several towns are in need of water supply systems.

STREAM POLLUTION

The towns located along the Missouri River deposit their untreated sewage into the main stream. Because of the large flow available for dilution purposes even during dry seasons, there is no problem along the Missouri River itself. A number of towns on tributary streams have sewage disposal systems. In some cases treatment is inadequate and stream flow is deficient. This results in an unhealthy condition. Many towns in the Basin need sewage systems. These should include adequate treatment plants to prevent stream pollution.

IRRIGATION

As stated above there are 300,000 acres of irrigable bottom lands along the Missouri River. 200,000 acres of this are on the first bench and could be irrigated by pumping projects involving an average lift of 15 to 18 feet. The irrigation of the second bench would involve a lift of 40 to 50 feet. Projects involving irrigation of the first bench along the Missouri River were particularly recommended by Mr. W. W. McLoughlin in a report on his inspection trip to proposed North Dakota irrigation projects during June 1936. Mr. McLoughlin also recommended flood irrigation projects on tributary streams. There are also large areas along tributary streams of the Basin that are suitable for irrigation. Missouri River water may be pumped to irrigate projects along the lower reaches of these valleys. Irrigable land farther upstream may be irrigated by the construction of medium or large storage reservoirs on these streams or by flood irrigation methods.

The Missouri River offers one of the prime requisites for irrigation, namely, an abundant water supply. The tributary streams within the Basin are characterized by quick run-off with very little water running in such streams during all seasons of the year other than the spring. Water for use in connection with irrigation along these streams is dependent on the storage of surplus water during periods of spring run-off.

FLOOD
IRRIGATION

Feasible flood irrigation projects exist on many of the tributaries in the Basin. Streams in the Basin on which flood irrigation can be practiced are: The Little Muddy Creek in Williams County, the Little Knife River, Shell Creek, Painted Woods Creek, Apple Creek, and Beaver Creek. Flooding and ponding of the stream bottom lands can be done by means of diversion dams and dikes. Crops suitable for flood irrigation on these bottom lands are alfalfa and the native grasses.

EXISTING
IRRIGATION
PROJECTS

A number of land owners along the Missouri River lower bench level lands are practicing irrigation by pumping water from the river onto their lands. These projects are located at Mandan, at Center, at Hensler, at Sanish and at Williston. Only relatively small tracts are being irrigated by these developments. The total Missouri River bottom lands in North Dakota under existing irrigation is approximately 1,200 acres. While irrigation is not always required for these bottom lands, it is very desirable in years and periods of subnormal precipitation and even during years of abundant rainfall the increased production would probably take care of the annual charge for construction, maintenance, and operation costs.

INVESTIGATIONS OF
PROPOSED
IRRIGATION
PROJECTS

Investigations and surveys for a number of proposed irrigation projects adjoining the main stem of the Missouri River in North Dakota have been made by federal agencies, including the Bureau of Reclamation and the War Department. Included in the list of proposed projects is the Williston pumping project and the Buford-Trenton pumping project, located along the Missouri River in Williams County, North Dakota. Construction work for the Williston unit was started in 1905 and the project was operated from 1907 to 1914. Canals and other irrigation works in connection with this irrigation project are now in fairly good condition and would not require extensive repairs and reconstruction. Surveys and plans were made for the Buford-Trenton unit and a pumping station with intake was constructed on the project for pumping into a settling reservoir. These irrigation works were constructed for use in connection with the operation of the Williston unit, and in connection with the operation of the Buford-Trenton unit. These improvements are available in connection with the present proposed develop-

ment of these projects. Districts are being formed in connection with the proposed operation of these projects. Completion of the engineering work together with the extension of irrigation works make it possible for advancing this project for early construction.

Surveys have been made by the Reclamation service for the Nesson Valley Project south of Ray, North Dakota. Surveys and mapping of the Ray Quadrangle have been made by the USCS. The Nesson Valley project is within the boundaries of this quadrangle. Surveys, studies and reports have been made for the Bismark project by the Reclamation Service. Further studies of the project have been made by A. Lincoln Fellows. The findings of these studies by Dr. Fellows were set forth in a report made by him in 1934. Less extensive surveys and studies have been made by federal agencies, of the following proposed projects along the Missouri River in the state: the Fort Berthold Flats Project; the Independence Project; the Ft. Stenvenson Flats Project; the Painted Woods Project, and the Square Butte Creek Project. Other potential irrigation possibilities have been listed, the total number of proposed irrigation projects on the bottom lands of the Missouri River in the state being about 40. Studies have been directed to some of the projects by the North Dakota Rehabilitation Corporation, The State Planning Board, and the State Engineer's Office with a view to the development of some of these projects for the purpose of establishing subsistence homesteads, resettlement of farm families required to move from submarginal purchase projects of the federal government, supplementing of dry farming operations and stock raising in the territory tributary to the Missouri River bottoms, and providing feed for stock for drouth stricken areas of the state during dry years. The North Dakota Rehabilitation Corporation has made an extensive study of a proposed irrigation project at Williston, North Dakota with a view to its establishment as a subsistence homestead project. A report on this project has been made to the North Dakota Rehabilitation Corporation by Prof. Wm. Budge of the University of North Dakota, and will be available in making further studies of the project. The State Planning Board and the State Engineer's office have made some study with respect to proposed projects at Hensler, Fort Rice and Livona with a view to supplementing dry farming operations in the vicinity of these proposed projects. It is proposed that farmers with well established farm homes on the uplands would purchase a tract of irrigable land on the Missouri River bottoms from which they would supplement their supply of feed for stock by irrigation of these bottom lands.

USE
OF
IRRIGABLE
LAND

The primary use of irrigated land in the Missouri River Basin would be for the growing of feed crops to insure a supply for the livestock of the Basin during drought years. This would eliminate the necessity for shipping in expensive feeds during drought years for the maintenance of foundation herds. If the proposed Bismarck Irrigation Project is realized it is expected that a sugar plant will be placed in Bismarck. This will result in the profitable raising of sugar beets on irrigated land in those areas having convenient transportation facilities to Bismarck. Irrigable land on the Yellowstone Irrigation project, in Montana and North Dakota, is used for raising sugar beets which are shipped to the sugar plant at Sidney, Montana. It is expected that additional irrigated land in the vicinity of Williston would be used similarly. It is probable that some truck farming on irrigable land would also develop, particularly in the vicinity of Bismarck and Williston.

EXISTING
RESERVOIRS

There are a total of 185 reservoirs in the Basin. These impound a maximum of approximately 70,532 acre feet of water. Most of these reservoirs are for recreational purposes. Others serve local stock watering needs and those built by the U. S. Bureau of Biological Survey as well as several others are primarily useful as waterfowl refuges. These reservoirs are listed in Table A. and are shown on Plate II.

PROPOSED
PROGRAM

It is proposed:

1. That pumping projects for irrigating the first bench of the Missouri River bottom lands be investigated immediately and that they be undertaken at the earliest possible date.
2. That irrigation projects on tributary streams be investigated and undertaken where practicable. These projects are of three general types. First of these is pumping from the Missouri River for the lower portion of the tributary stream valley. The second in importance is irrigation by means of stream reservoirs both by gravity flow and by pumping. The third method is purely local in character and involves spring flooding by means of channel dams built for the purpose. This method is generally referred to as flood irrigation. Irrigation and similar projects are listed in Table D and are shown on Plate II.
3. That water supply and sewage disposal improvements be provided where needed in the Basin. Proposed improvements in water supply are listed in Table B and proposed improvements in sewage disposal are listed in Table C and both are shown on Plate I.
4. That additional small reservoirs be provided for purposes of recreation, stock watering, and waterfowl conservation. These projects are also listed in Table D and are

shown on Plate II. All dams constructed hereafter in the Basin should be provided with outlet gates for releasing the water stored when a great need arises for it downstream or when it becomes so polluted that it is a definite health hazard to the community. Many existing dams should also be provided with outlet gates.

5. That a detailed soil survey and land classification be begun as soon as is possible on all lands that appear to be irrigable in order to ascertain the suitability of these lands for irrigation in each of the several areas. These surveys should follow the aerial mapping of the irrigable regions. This mapping will provide, in addition to its utility as the basis of the proposed soil survey and land classification, much needed data on present land use. The cost of the aerial mapping would approximate 5¢ per acre. The cost of the detailed soil survey and land classification would be an addition 5¢ per acre. Thus, to properly predetermine the areas suited to irrigation would entail the expenditure of 10¢ per acre for 300,000 acres of irrigable land in the Missouri River basin, or approximately \$30,000.

RURAL
WATER
SUPPLY

A large number of small reservoirs have been proposed for the Basin by various agencies. Those that would serve purposes of recreation, irrigation, and waterfowl refuges have been included in the proposed program. It is proposed that before any more small dams for stock watering purposes be constructed in the Basin, a detailed survey of rural water supply be undertaken to determine the best and most economical method of securing adequate and satisfactory water supplies for stock watering purposes. Where an adequate ground water supply is available it is probable that this would be through the construction of community wells. In other localities not having a reliable ground water supply the construction of surface reservoirs would be the only alternative. Following such a survey it is proposed that assistance be given in developing an adequate rural water supply.

STREAM
GAGING
AND
WEATHER
OBSERVATION
FACILITIES

Proposed weather observation stations are listed in Table E and these together with present facilities for stream gaging and weather recording are shown on Plate III. It is strongly urged that adequate facilities be established and maintained for the recording of stream flow and weather data for use in future planning.

EXISTING RESERVOIRS

MISSOURI RIVER BASIN

TABLE A

No.	County	Sec.	Twp.	Rge.	Storage A. F.	Cost Est.	Use	Designation	Description and Remarks	Legend
1.	Divide	2	160	95	10	\$ 1,500	IV	P	Dan---Coulee.	***
2.	Divide	16	160	102	73	7,000	IV	F	Dan---Coulee.	**
3.	Williams	15	156	104	30	6,000	IV	F	Dan---Cov Creek.	*
4.	Williams	31	156	100	35	6,000	IV	E	Dan---Little Muddy Creek.	*
5.	Williams	36	155	101	15	2,500	III, IV	G	Dan---Spring fed.	*
6.	Williams	36	155	101	16	9,200	III, IV	E	Dan---Overflow from No. 4.	*
7.	Williams	25	157	95	28	9,100	IV	F	Dan---Creek.	*
8.	Williams	33	155	101	9	1,100	IV	G	Dan---Creek.	*
9.	Williams	31	155	101	10	2,900	IV	E	Dan---Sand Creek.	*
10.	Williams	16	155	101	5	1,000	IV	G	Dan---Creek.	*
11.	Williams	24	156	98	8	1,500	III	F	Dan---Creek. Near Wheelock.	*
12.	Williams	33	155	102	9	1,500	IV	F	Dan---Coulee.	*
13.	Williams	13	153	101	11	1,100	IV	F	Dan---Coulee.	*
14.	Williams	10	156	103	43	3,300	IV	G	Dan---Cow Creek.	*
15.	Williams	16	155	99	2,700	81,200	III	E	Epping Dan---Stoney Creek.	**
16.	Williams	15	155	103	76	800	IV	F	Dan---Painted Woods Creek.	*

TABLE A (Cont'd.)

EXISTING RESERVOIRS

MISSOURI RIVER BASIN

No.	County	Sec.	Twp.	Rge.	Storage A. F.	Cost Est.	Use	Design- nation	Description and Remarks	Legend
17.	Williams	30	159	99	43	\$ 7,000	IV	G	Dam--Little Muddy Creek.	**
18.	Williams	15	158	99	80	8,000	IV	E	Dam--Little Muddy Creek.	**
19.	Williams	16	158	99	70	7,000	IV	G	Dam--Little Muddy Creek.	**
20.	Williams	36	157	103	20	2,500	IV	F	Dam--Coulee.	**
21.	Williams	27	157	102	17	2,000	IV	G	Dam--Creek.	**
22.	Williams	16	157	100	130	10,000	IV	E	Athens Dam--Little Muddy Creek.	**
23.	Williams	30	157	99	52	5,200	IV	G	Dam--Creek.	**
24.	Williams	1	156	97	41	4,100	IV	F	Dam--Coulee.	**
25.	Williams	5	156	103	12	1,500	IV	F	Dam--Cow Creek.	**
26.	Williams	9	155	100	32	3,500	IV	F	Dam--Creek.	**
27.	Williams	12	155	99	47	4,700	IV	G	Dam--Creek.	**
28.	Williams	15	154	101	9	1,000	IV	G	Dam--Sand Creek.	**
29.	Williams	12	153	100	7	1,000	IV	F	Dam--Coulee.	**
30.	Williams	20	153	102	2,100	10,000	IV	F	Dam--Creek.	**
31.	Williams	13	155	101	16	2,000	IV	F	Dam--Creek.	*
32.	Williams	22	155	97	26	8,200	IV	F	Dam--Creek.	**
33.	Williams	36	159	101	30	3,000	IV	G	Dam--Creek.	**

TABLE A (Cont'd.)

EXISTING RESERVOIRS

MISSOURI RIVER BASIN

No.	County	Sec.	Twp.	Rge.	Storage A. F.	Cost Est.	Use	Designation	Description and Remarks	Legend
34.	Williams	12	155	104	10	\$ 1,500	IV	F	Dan--Creek.	***
35.	Williams	15	153	103	10	1,500	IV	G	Dan--Creek.	***
36.	McKenzie	26	151	102	16	2,500	IV	P	Dan--Creek.	*
37.	McKenzie	25	151	99	95	9,400	IV	F	Dan--Tobacco Garden Creek.	*
38.	McKenzie	31	152	96	64	9,900	IV	F	Dan--Clear Creek.	*
39.	McKenzie	21	152	95	35	3,400	IV	F	Dan--Creek.	*
40.	McKenzie	4	150	100	70	6,300	IV	E	Dan--Timber Creek. Northeast of Rawson.	*
41.	McKenzie	13	150	95	32	2,100	IV	E	Dan--Bear Creek.	*
42.	McKenzie	28	150	95	39	3,900	IV	F	Dan--Bear Creek.	*
43.	McKenzie	8	152	97	177	6,500	IV	F	Dan--Clear Creek.	**
44.	McKenzie	15	151	100	9	3,000	IV	P	Hagen Dan--Coulee.	**
45.	McKenzie	22	152	94	10	1,000	IV	F	Dan--Creek.	***
46.	McKenzie	36	153	94	46	4,000	IV	G	Riverview Twp. Dan--Creek.	**
47.	McKenzie	32	151	97	16	3,000	IV	F	Elliott Dan--Creek.	**
48.	Mountrail	16	154	91	875	21,600	IV	F	Dan--Little Knife River.	*
49.	Mountrail	9	156	91	15	3,000	IV	P	Dan--Coulee.	*
50.	Mountrail	12	156	91	5	2,000	IV	F	Dan--Coulee.	*

TABLE A (Cont'd.)

EXISTING RESERVOIRS

MISSOURI RIVER BASIN

No.	County	Sec.	Typ.	Rge.	Storage A. F.	Cost Est.	Use	Designation	Description and Remarks	Legend
51.	Mountrail	7	152	91	11	\$ 3,200	IV	E	Dam--Crane Creek.	*
52.	Mountrail	2	156	92	9	3,100	IV	E	Dam--Coulee.	*
53.	Mountrail	36	152	90	7	6,000	III	G	Dam--Creek. At Parshall.	*
54.	Mountrail	17	158	91	24	3,000	IV	P	Dam--Outlet to Lostwood Lake.	*
55.	Mountrail	13	158	92	240	4,600	IV	F	Dam--Coulee.	*
56.	Mountrail	13	152	89	48	6,300	III, IV	E	Dam--Spring fod creek.	*
57.	Mountrail	35	154	94	20	300	IV	E	Dam--White Earth River.	**
58.	Mountrail	16	153	94	20	2,000	IV	G	Dam--Branch of White Earth River.	**
59.	Mountrail	14	157	91	10	700	IV	F	Dam--Creek. Tributary of Little Knife.	**
60.	Mountrail	30	158	94	20	2,000	IV	P	Dam--Coulee.	**
61.	Mountrail	11	154	90	5	500	IV	P	Dam--Coulee.	**
62.	Mountrail	36	154	90	22	2,200	IV	G	Dam--Branch of Shell Creek.	**
63.	Mountrail	14	151	90	23	2,300	IV	P	Dam--Coulee.	**
64.	Mountrail	25	156	91	50	5,000	IV	F	Dam--Little Knife River.	**
65.	Mountrail	15	156	89	7	700	IV	P	Dam--Coulee.	**
66.	Mountrail	30	155	89	7	700	IV	F	Dam--Creek.	**

TABLE A (Cont'd.)

EXISTING RESERVOIRS

MISSOURI RIVER ~~Basin~~

No.	County	Sec.	Typ.	Ree.	Storage A. F.	Cost Est.	Use	Designation	Description and Remarks	Legend
67.	Mountrail	22	151	88	100	\$ 10,000	IV	P	Dan---Coulee.	**
68.	Mountrail	22	156	90	40	4,000	IV	P	Dan---Coulee.	**
69.	Mountrail	3	156	90	30	3,000	IV	P	Dan---Coulee.	**
70.	Mountrail	18	155	92	25	2,500	IV	G	Dan---Little Knife River.	**
71.	Mountrail	16	152	88	49	4,900	III	G	Dan---Creek at Wabek.	**
72.	Mountrail	28	157	88	22	2,200	IV	P	Dan---Coulee.	**
73.	Mountrail	28	157	88	7	700	IV	P	Dan---Coulee.	**
74.	Mountrail	7	153	89	23	2,300	IV	P	Dan---Coulee.	**
75.	Mountrail	14/15	152	91	50	5,000	IV	P	Dan---Coulee.	**
76.	Mountrail	25	152	93	22	2,200	IV	F	Dan---Creek.	**
77.	Mountrail	12	156	92	5	2,100	IV	F	Dan---Coulee.	*
78.	McLean	34	150	85	50	5,000	IV	G	Dan---Creek.	**
79.	McLean	26	149	85	90	9,000	IV	F	Dan---Creek.	**
80.	McLean	24	148	87	29	3,000	IV	F	Dan---Douglas Creek.	**
81.	McLean	1	150	89	50	5,000	IV	F	Dan---Coulee.	**
82.	McLean	20	149	89	90	9,000	IV	F	Dan---Coulee.	**

TABLE A (Cont'd.)

EXISTING RESERVOIRS

MISSOURI RIVER BASIN

No.	County	Sec.	Twp.	Rge.	Storage A. F.	Cost Est.	Use	Designation	Description and Remarks	Legend
83.	McLean	35/36	146	84	67	\$ 6,700	IV	F	Dan---Creek.	**
84.	McLean	36	145	83	44	4,400	IV	F	Falkirk Dam---Coulee. *	**
85.	McLean	36	149	81	40	4,000	IV	G	Dan---Creek.	**
86.	McLean	15	147	80	140	14,000	IV	F	Dan---Lake outlet.	**
87.	McLean	36	144	81	86	1,400	VII	P	Lost Lake Dan.	*****
88.	McLean	21	148	81	1,230	1,500	VII	G	Dam and Diversion Ditch-Lake Nettie.	*****
89.	McLean	28	144	80	11.	700	VII	F	Dan---Painted Woods Creek.	*
90.	McLean	4	143	81	80	12,000	IV	E	Dan---Painted Woods Creek.	*
91.	McLean	30	143	80	189	6,000	IV	F	Dan---Coulee. West of Wilton.	*
92.	McLean		144	82	30	3,000	III	F	Washburn Dan---Creek.	**
93.	McLean	5	149	90	30	3,000	IV	F	Dan---Coulee.	***
94.	McLean	34	148	88	30	3,000	IV	F	Dan---Creek.	***
95.	McLean	7	148	88	400	1,000	IV	F	Dan---Douglas Creek.	**
96.	McLean	2	149	80	300	1,000	VII	F	Dan---Strawberry Lake.	*****
97.	McLean	1	148	85	155	16,000	IV	F	Wilcox Dan---Creek.	**
98.	Burleigh	14	139	78	69	11,000	IV	E	Dan---Apple Creek.	*

EXISTING RESERVOIRS

TABLE A (Cont'd.)

MISSOURI RIVER BASIN

No.	County	Sec.	Twp.	Rge.	Storage A. F.	Cost Est.	Use	Designation	Description and Remarks	Legend
99.	Burleigh	4	140	81	20	\$ 3,000	IV	F	Dan---Burnt Creek.	*
100.	Burleigh	26	141	81	20	2,800	IV	F	Dan---Coulee.	*
101.	Burleigh	8	139	78	20	600	IV	F	Dan---Creek.	*
102.	Burleigh	29	144	79	13	1,700	IV	E	Dan---Painted Woods Creek.	*
103.	Burleigh	20	140	80	20	200	IV	P	Dan---Burnt Creek.	*
104.	Burleigh	36	139	79	20	200	IV	F	Dan---Apple Creek.	*
105.	Burleigh	16	140	80	2	900	IV	F	Dan---Burnt Creek.	*
106.	Burleigh	30	140	80	6	1,000	IV	F	Dan---Burnt Creek.	*
107.	Burleigh	10	139	80	5	1,000	IV	F	Dan---Creek.	*
108.	Burleigh	18	138	79	35	1,400	IV	F	Dan---Apple Creek. Near Fort Lincoln.	*
109.	Burleigh	36	139	78	41	800	IV	E	Dan---Apple Creek.	*
110.	Burleigh	24	138	80	62	1,100	IV	E	Dan---Apple Creek. Near Fort Lincoln.	*
111.	Burleigh	24	140	78	42	600	III, IV	E	Dan---West Branch of Apple Creek.	*
112.	Burleigh	19	139	78	18	1,800	IV	E	Dan---Apple Creek.	*
113.	Burleigh	31	141	79	14	2,600	IV	F	Dan---Burnt Creek.	*
114.	Burleigh	36	141	81	14	4,400	IV	F	Dan---Coulee.	*

EXISTING RESERVOIRS
MISSOURI RIVER BASIN

TABLE A (Cont'd.)

No.	County	Sec.	Twp.	Rge.	Storage A. F.	Cost Est.	Use	Designation	Description and Remarks	Legend
115.	Burleigh	25	144	79	15	\$ 4,000	IV	G	Dam--Painted Woods Creek.	*
116.	Burleigh	10	140	80	110	1,400	IV	G	Dam--Burnt Creek.	*
117.	Burleigh	16	137	76	45,377	82,200	VII	F	Long Lake--Three Dams.	*****
118.	Burleigh	20	143	77	872	14,300	VII	F	Canfield--Lake--Dam.	*****
119.	Burleigh	5	138	76	340	28,200	VI	G	R. R. Reservoir.	****
120.	Burleigh	22	139	77	117	15,600	VI	G	Dam--Coulee.	*****
121.	Emmons	36	132	74	65	1,500	IV	P	Dam--Coulee.	*
122.	Emmons	36	132	76	32	1,400	IV	F	Dam--Coulee.	*
123.	Emmons	31	130	77	265	22,000	IV	F	Dam--Cattail Creek.	**
124.	Emmons	5	133	76	126	1,000	IV	P	Dam--Coulee.	*
125.	Emmons	4	135	75	261	5,700	IV	F	Dam--Branch of Beaver Creek.	*
126.	Emmons	27	129	75	500	6,900	IV	F	Dam--Creek.	*
127.	Emmons	33	133	75	876	7,000	VII	E	Hanson Dam--Creek.	*****
128.	Emmons	33	136	76	84	8,500	IV	F	Klabunde Dam--Creek.	*****
129.	Emmons	4	133	78	252	4,900	VII	E	Lawler Dam--Creek.	*****
130.	Emmons	16	132	74	180	7,100	VII	F	State Land Project--Beaver Creek.	*****

TABLE A (Cont'd.)

EXISTING RESERVOIRS

MISSOURI RIVER BASIN

No.	County	Sec.	Twp.	Rge.	Storage A. F.	Cost Est.	Use	Designation	Description and Remarks	Legend
131.	Emmons	3	134	76	300	\$ 3,600	VII	E	Appert Dam--Branch of Beaver Creek.	*****
132.	Morton	15	136	82	55	7,300	IV	E	Dam--Creek.	*
133.	Morton	29	140	81	6	3,100	IV	G	Dam--Square Butte Creek.	*
134.	Morton	18	140	81	10	900	IV	F	Dam--Creek.	*
135.	Morton	1	140	82	40	4,000	III, IV	E	Dam--Square Butte Creek. At Harmon.	*
136.	Morton	17	140	81	144	800	III, IV	E	Dam--Square Butte Creek.	*
137.	Morton	23	137	83	2	1,000	IV	E	Dam--Little Heart River.	*
138.	Morton	18	137	82	3	500	IV	E	Dam--Little Heart River.	*
139.	Morton	7	137	81	88	8,800	IV	F	Dam--Coulee.	*
140.	Morton	17	137	80	20	2,000	III, IV	E	Dam--Little Heart River.	*
141.	Morton	17	137	80	77	7,700	III, IV	E	Dam--Little Heart River.	*
142.	Mercer	35	146	89	19	1,900	IV	F	Dam--Head Water of Beaver Creek.	**
143.	McIntosh	2	132	70	27	5,000	III, IV	P	Dam--Coulee. Near Lake.	*
144.	McIntosh	6	130	73	15	4,200	IV	E	Dam--South Branch of Beaver Creek.	*
145.	McIntosh	5	130	73	86	5,400	IV	G	Dam--South Branch of Beaver Creek.	*
146.	McIntosh	33	131	73	53	6,700	IV	F	Dam--South Branch of Beaver Creek.	*

TABLE A (Cont'd.)

EXISTING RESERVOIRS

MISSOURI RIVER BASIN

No.	County	Sec.	Twp.	Rge.	Storage A. F.	Cost Est.	Use	Designation	Description and Remarks	Legend
147.	McIntosh	23	131	73	15	\$ 4,000	IV	P	Dam---Coulee.	*
148.	McIntosh	25	131	73	65	8,000	IV	F	Dam---South Branch of Beaver Creek.	*
149.	McIntosh	21	132	73	125	11,000	IV	P	Dam---Creek.	*
150.	McIntosh	19	129	72	75	7,500	IV	E	Dam---Big Beaver Creek.	*****
151.	Kidder	23	138	70	4,161	18,000	VII	E	Dam---Lake George.	*****
152.	Kidder	8	139	74	18	2,500	IV	F	Dam---Coulee.	**
153.	Kidder	17	137	72	12	4,000	IV	F	Dam---Coulee.	**
154.	Kidder	16	143	73	67	7,000	IV	P	Dam---Coulee.	**
155.	Kidder		141	74	21	7,000	IV	P	Dam---Coulee.	**
156.	Kidder	19	144	72	19	2,500	IV	F	Dam---Coulee.	**
157.	Logan	32	133	70	77	6,500	IV	F	Dam---Coulee.	**
158.	Logan	22	134	70	55	6,300	III, IV	F	Dam---Coulee.	**
159.	Logan	3	133	73	66	7,800	IV	G	Dam---Beaver Creek.	*
160.	Logan	25	134	72	16	2,400	III	G	Dam---Beaver Creek.	*
161.	Logan	33	134	71	2,000	10,300	III	E	Dam---Outlet of Beaver Lake. Near Burnstad.	*
162.	Cliver	27	141	81	8	400	IV	F	Dam---Coulee.	*

TABLE A (Cont'd.)

EXISTING RESERVOIRS

MISSOURI RIVER BASHA

No.	County	Sec.	Twp.	Rge.	Storage		Use	Designation	Description and Remarks	Legend
					A. F.	Cost Est.				
163.	Oliver	26	141	81	3	\$ 2,000	IV	F	Dam---Coulee.	*
164.	Oliver	23	142	84	38	3,500	IV	G	Dam---Square Butte Creek.	**
165.	Burleigh	21	143	79	10	2,400	IV	E	Thor Dam---Coulee.	**
166.	Burleigh	24	138	79	7	500	II, IV	F	Dam---Coulee.	*
167.	Burleigh	31	144	78	10	2,400	IV	E	Dam---Painted Woods Creek.	***
168.	Burleigh	30	141	77	10	2,400	IV	F	Dam---Coulee.	***
169.	Burleigh	21	143	78	10	1,000	IV	P	Dam---Painted Woods Creek.	***
170.	Burleigh	34	143	79	10	1,000	IV	P	Dam---Painted Woods Creek.	**
171.	Burleigh	6	142	78	40	3,000	II	F	Dam---Painted Woods Creek.	**
172.	Emmons	36	134	77	10	1,000	IV	F	Dam---Branch of Beaver Creek.	***
173.	McLean	30	148	79	9	900	IV	F	Dam---Coulee.	***
174.	Morton	25	140	82	21	4,700	IV	F	Dam---Coulee.	**
175.	Morton	1	137	82	34	3,000	IV	F	Dam---Coulee.	**
176.	Mercer	12	146	86	16	1,500	IV	F	Dam---Coulee.	***
177.	Mercer	34	144	84	19	2,000	IV	F	Dam---Coulee.	***
178.	Sioux	22	129	79	10	1,000	IV	F	Dam---Coulee.	***

EXISTING RESERVOIRS
MISSOURI RIVER BASIN

TABLE A (Cont'd.)

No.	County	Sec.	Twp.	Rge.	Storage A. F.	Cost Est.	Use	Design- nation	Description and Remarks	Legend
179.	Sioux	27	132	82	10	\$ 1,000	IV	F	Dam--Coulee.	***
180.	Sioux	20	133	80	10	1,000	IV	P	Dam--Coulee.	***
181.	Sioux	13	130	80	10	1,000	IV	G	Dam--Creek.	***
182.	Sioux	28	131	82	11	900	IV	F	Dam--Coulee.	***
183.	Sioux	19	131	80	30	2,000	IV	F	Dam--Coulee.	***
184.	Burleigh	2	142	76	1,000	10,000	VII	F	Dam--Lake Outlet.	**
185.	McLean	1	147	85	225	15,000	IV	G	Dam--Garrison Creek.	**
186.	Kidder	30	143	74	500	5,000	VII	F	Hutchinson Project.	*****
187.	McLean	36	150	80	500	5,000	VII	F	Camp Lake Project.	*****
188.	Burleigh	16	144	76	500	5,000	VII	F	Florence Lake Project.	*****
189.	Oliver	36	141	85	500	5,000	VII	F	Lake Oliver Project.	*****
190.	Burleigh	13	143	78	500	5,000	VII	F	Lake Lundberg Project.	*****
191.	Montrail	30	151	91	500	5,000	VII	F	Legion Lake Project.	*****
192.	McLean	16/17	150	88	500	5,000	VII	F	Lake Susie Project.	*****

TOTAL EXISTING RESERVOIRS: 74,032 \$1,004,600

TABLE A (Cont'd.)

EXISTING RESERVOIRS

MISSOURI RIVER BASIN

LEGEND:

- * Constructed by CCC
- ** Constructed by FERA and WPA
- *** Constructed by Individuals
- **** Constructed by Railways and Municipalities
- ***** Constructed by U. S. Biological Survey

USE:

- II Irrigation
- III Recreation
- IV Stock Watering and Water Conservation
- VI Railway Supply
- VII Waterfowl Refuge

DESIGNATION:

- E Excellent
- G Good
- F Fair
- P Poor

TABLE B PROPOSED IMPROVEMENTS IN WATER SUPPLY

MISSOURI RIVER BASIN

PLATE I	Objec-tion to Present Supply	Proposed Improvements	Surveys	Wells	Treatment Plant	Dist. System	Total Estimate		
MAP. NO.	Municipality	Fop.							
1.	Appan	113	Inadequate	Survey and 1 well	100	600	700		
2.	Alamo	211	Inadequate	Survey and 1 well	100	600	700		
3.	Ashley	1033	Unsatisfactory and Inadequate. No water system	Survey and 4 wells Distribution System and treatment plant	100	2400	15,000	20,000	37,500
4.	Blaisdell	100	Inadequate	Survey and 1 well	100	600	700		
5.	Burnstad	200	Inadequate and unsatisfactory	Survey and 1 well	100	600	700		
6.	Coleharbor	150	Inadequate	Survey and 1 well	100	600	700		
7.	Dawson	306	Inadequate	Survey and 2 wells	100	1200	1,300		
8.	Grenora	1187	Inadequate-Needs System. Inadequate	Survey, 2 wells, and distribution system	100	1200	13,000	17,000	31,300
9.	Garrison	1024	Inadequate Construction Changes	Survey and 4 wells Eliminate pit	100	2100	2,000	4,500	
10.	Goodrich	1168	Unsatisfactory. Danger of pollution	Distribution system, Treatment plant, Construction changes.		13,000	17,000	30,000	

TABLE B (Cont'd)

PROPOSED IMPROVEMENTS IN WATER SUPPLY

MISSOURI RIVER BASIN

PLATE I MAP NO.	Municipality	Pop.	Objection to Present Supply	Proposed Improvements	Surveys	Wells	Treatment Plant	Dist. System	Total Estimate
11.	Hanks	213	Inadequate Unsatisfactory	Survey and 1 well	100	600			700
12.	Hazelton	146	Unsatisfactory	Distribution System Treatment Plant.			13,000	17,000	30,000
13.	Hague	364	Inadequate	Survey and 2 wells	100	1200			1,300
14.	Lehr	158	Unsatisfactory	Distribution system Treatment Plant.			13,000	17,000	30,000
15.	Linton	1192	Unsatisfactory Danger of pollution	Remove wells from pits. Treatment plant			15,000	1,500	16,500
16.	Max	500	Unsatisfactory and Inadequate. No water system	Survey and 2 wells Distribution system and treatment plant	100	1200	10,000	20,000	31,300
17.	Mercer	250	Inadequate	Survey and 1 well	100	600			700
18.	McKenzie	125	Inadequate	Survey and 1 well	100	600			700
19.	Moffitt	128	Inadequate	Survey and 1 well	100	600			700
20.	Napoleon	709	Unsatisfactory No water system	Distribution system treatment plant			12,000	23,000	35,000

TABLE B (Cont'd) PROPOSED IMPROVEMENTS IN WATER SUPPLY

MISSOURI RIVER BASIN

PLATE I MAP NO.	Municipality	Pop.	Objection to Present Supply	Proposed Improvement	Survey Wells	Treatment Plant	Dist. System	Total Estimate
21.	Power Lake	382	Inadequate	Survey and 2 wells	100	1200		1,300
22.	Farshall	470	Unsatisfactory Inadequate	Survey and 2 wells distribution system and treatment plant	100	1200	20,000	31,300
23.	Ray	621	Inadequate No water system	Survey, 3 wells, distribution system and treatment plant	100	1800	20,000	36,900
24.	Ryder	457	Unsatisfactory	Survey 2 wells, dis- tribution system and treatment plant.	100	1200	17,000	31,300
25.	Regan	162	Inadequate	Survey and 1 well	100	600		700
26.	Robinson	185	Inadequate	Survey and 1 well	100	600		700
27.	Stanley	936	Unsatisfactory High soda content	Water treatment plant. Repair pump house, floors provide new pit cover.			20,000	20,050
28.	Sanish	463	Inadequate No water system	Water system and treatment using Miss- ouri River supply			10,000	30,000

TABLE B (Cont'd) PROPOSED IMPROVEMENTS IN WATER SUPPLY

MISSOURI RIVER BASIN

PLATE I MAP NO.	Municipality	Pop.	Objection to Present Supply	Proposed Improvements	Surveys	Wells	Treatment Plant	Dist. System	Total Estimate
29.	Sterling	110	Inadequate	Survey and 1 well	100	600			700
30.	Strasburg	695	Unsatisfactory No water system	Distribution system and treatment plant			13,000	17,000	30,000
31.	Tioga	1,35	Unsatisfactory	Water distribution system			13,000	17,000	30,000
32.	Turtle Lake	579	Inadequate. No water system	Survey 3 wells, dis- tribution system and treatment plant	100	1800	13,000	17,000	31,000
33.	Tuttle	383	Inadequate	Survey and 2 wells	100	1200			1,300
34.	Underwood	1,448	Inadequate	Survey and 2 wells distribution system and treatment plant	100	1200	13,000	17,000	31,300
35.	Van Hook	372	Inadequate Unsatisfactory	Survey and 2 wells	100	1200			1,300
36.	Wild Rose	518	Inadequate No water system	Survey and 2 wells distribution system and treatment plant	100	1200	13,000	17,000	31,300
37.	Washburn	753	Needs filter plant Danger of pollution	Filter plant, coagu- lation, settling tank, filter, and chlorination. Const- ruction changes.			50,000	1,000	51,000

TABLE B (Cont'd)

PROPOSED IMPROVEMENTS IN WATER SUPPLY

MISSOURI RIVER BASIN

PLATE I MAP NO.	Municipality	Pop.	Objection to Present Supply	Proposed Improvements	Surveys	Wells	Treatment Plant	Dist. System	Total Estimate
38.	Wilton	1001	Unsatisfactory	Replace pumps and improve construction.			10,000	10,000	10,000
39.	Wishek	1116	Unsatisfactory No water system	Distribution system and treatment plant			13,000	17,000	30,000
40.	Wing	237	Unsatisfactory Inadequate	Survey and 1 well	100	500			700
41.	Zeeland	419	Unsatisfactory	Dist. System and treatment plant			13,000	17,000	30,000
Sub-Totals:					\$2,800	\$29,100	\$313,000	\$344,550	

\$689,750

TOTAL PROPOSED IMPROVEMENTS IN WATER SUPPLY:

TABLE B (Cont'd) PROPOSED IMPROVEMENTS IN WATER SUPPLY

MISSOURI RIVER BASIN

SUMMARY

CLASS "A" PROJECTS DEMANDING IMMEDIATE ATTENTION:

Local surveys of available sources	\$ 2,800
Distribution Systems--Ashley, Garrison, Linton, Max Napoleon, Ray, Stanley, Strasburg, Turtle Lake, Wildrose, Washburn, Wilton, and Wishek	168,550
Treatment Plants--Ashley, Max, Napoleon, Ray, Strasburg, Turtle Lake, Wildrose, Washburn, and Wishek	154,000
Total Class "A" Projects	\$ 325,350

CLASS "B" PROJECTS DEMANDING IMMEDIATE ATTENTION UPON COMPLETION OF SURVEY:

Shallow Wells	29,400
---------------	--------

CLASS "C" PROJECTS IN PLAN NOT INCLUDED IN CLASSES "A" AND "B":

Distribution Systems	176,000
Treatment Plants	159,000
Total Class "C" Projects	335,000

TOTAL PROPOSED IMPROVEMENTS IN WATER SUPPLY:

\$ 689,750

PROPOSED IMPROVEMENTS IN SEWAGE DISPOSAL

MISSOURI RIVER BASIN

PLATE I MAP NO.	Municipality	Pop. of Sewage Treatment	Type and Adequacy	Proposed Improvements	Estimated Cost
CLASS "A" PROJECTS DEMANDING IMMEDIATE ATTENTION:					
42.	Wishek	1,116	No Sewage System	Sewage System with Treatment Plant	\$ 60,000
43.	Ashley	1,033	No Sewage System	Sewage System with Treatment Plant	60,000
44.	Wilton	1,001	Sep. No Treatment Inadequate	Treatment Plant	110,000
45.	Napoleon	709	No Sewage System	Sewage System with Treatment Plant	110,000
46.	Strasburg	695	No Sewage System	Sewage System with Treatment Plant	35,000
47.	Ray	621	No Sewage System	Sewage System with Treatment Plant	110,000
48.	Turtle Lake	579	No Sewage System	Sewage System with Treatment Plant	35,000
49.	Wild Rose	518	No Sewage System	Sewage System with Treatment Plant	35,000
50.	Max	500	No Sewage System	Sewage System with Treatment Plant	35,000
51.	Linton	1,192	Sep. Septic Tank, P.S. Inadequate	Treatment Plant	110,000
52.	Steele	519	Inadequate	Treatment Plant	10,000
53.	Stanley	936	Imhoff Tank, Inadequate	Treatment Plant	10,000
TOTAL CLASS "A" PROJECT					\$ 1,110,000

TABLE C (Cont'd) PROPOSED IMPROVEMENTS IN SEWAGE DISPOSAL

MISSOURI RIVER BASIN

PLATE I MAP NO.	Municipality	Pop.	Type and Adequacy of Sewage Treatment	Proposed Improvements	Estimated Cost
54.	Underwood	1,188	No Sewage System	Sewage System with Treatment Plant	35,000
55.	Grenora	1,187	No Sewage System	Sewage System with Treatment Plant	35,000
56.	Parshall	1,170	No Sewage System	Sewage System with Treatment Plant	35,000
57.	Goodrich	1,168	No Sewage System	Sewage System with Treatment Plant	35,000
58.	Sanish	1,163	No Sewage System	Sewage System with Treatment Plant	35,000
59.	Lehr	1,158	No Sewage System	Sewage System with Treatment Plant	35,000
60.	Ryder	1,157	No Sewage System	Sewage System with Treatment Plant	30,000
61.	Hazelton	1,146	No Sewage System	Sewage System with Treatment Plant	35,000
62.	Tioga	1,135	No Sewage System	Sewage System with Treatment Plant	35,000
63.	Zeeland	1,119	No Sewage System	Sewage System with Treatment Plant	30,000
64.	Plaza	1,108	No Sewage System	Sewage System with Treatment Plant	35,000
Total Class "C" Projects					\$ 375,000
TOTAL PROPOSED IMPROVEMENTS IN SEWAGE DISPOSAL:					\$ 815,000

LEGEND FOR SEWAGE AND SEWAGE TREATMENT: Sep. -- Separate System

TABLE D

PROPOSED IMPROVEMENTS IN USE OF SURFACE WATER RESOURCES

MISSOURI RIVER BASIN

Plate II Map No.	County	Sec.	Twp.	Rge.	Storage Cap.- A. F.-Est.	Irr. Land Acres Est.	Cost Est.	Use	Designation	Description and Remarks	Survey
<u>CLASS "A" PROJECTS DEMANDING IMMEDIATE ATTENTION:</u>											
1.	Burleigh	138/139	80		150	\$ 5,000	II	E		Construction of State Penitentiary irrigation project as a state demonstration project. Irrigation by pumping from the Missouri River.	**
2.	McLean	144 143	81 81		8,000	150,000	II	E		Construction of Painted Woods irrigation project as a federal state cooperative demonstration project. Irrigation by pumping from the Missouri River and using Painted Woods Lake as a temporary storage reservoir.	*****
3.	Williams	152 153 153	102 103 104		15,000	225,000	II	G		Rehabilitate and extend Buford-Trenton pumping project.	*****
4.	Williams	154 155	100 101		11,300	170,000	II	G		Rehabilitate Williston pumping project.	*****
5.	Burleigh	138	80			10,000	II			Survey of Bismarck pumping project.	*****

TABLE D (Cont'd.) PROPOSED IMPROVEMENTS IN USE OF SURFACE WATER RESOURCES

MISSOURI RIVER BASIN

Plate II Map No.	County	Sec.	Twp.	Rge.	Storage Cap.-- A. F.--Est.	Irr. Land Acres Est.	Cost Est.	Use	Designation	Description and Remarks	Survey
6.	Williams		154	96			\$ 2,500	II		Survey of Nesson Valley pumping project 35 miles east of Williston.	*****
7.	McLean		147 148	85 85			5,000	II		Survey of Fort Stevenson Flats pumping project.	*
8.	McLean		149	90			1,000	II		Survey of Deepwater Creek* reservoir and pumping pro- ject on Deepwater Creek and the Missouri River.	
9.	McLean		150	91			1,000	II		Survey of pumping pro- ject at confluence of Shell Creek with the Missouri River.	*
10.	Oliver		143 144	81 82			2,000	II		Survey of Sanger pump- ing project. Possibly supplemented by small reservoirs on a creek.	*
11.	Oliver		142	84	1,520	300	60,000	II,IV	G	Construction of Center Dam on Square Butte Creek for community gardens.	*****
12.	McLean		147	88	90		5,000	II,IV	G	Dam--Six Mile Creek.	*

PROPOSED IMPROVEMENTS IN USE OF SURFACE WATER RESOURCES

MISSOURI RIVER BASIN

Plate II Map No.	County	Sec.	Twp.	Rge.	Storage Cap. A. F. Est.	Irr. Land Acres Est.	Cost Est.	Use	Desig- nation	Description and Remarks	Survey
13.	McLean	9	149	89	26		\$ 3,000	III	E	Dam---Deepwater Creek.	*****
14.	Mountrail	17	153	92	25		3,000	III,IV	E	Dam---Little Knife River.	**
15.	Mountrail	19	157	93	2,000		76,000	III	E	Dam---White Earth Creek.	**
16.	Emmons	32	131	77	50		6,000	III,IV	G	Dam---Little Beaver Creek.	*****
17.	Mountrail	18/19	158	93	50		2,000	III,IV	E	Dam---White Earth Creek.	*****
18.	Williams	17	158	103	100		11,600	III	E	Dam---Creek.	**
19.	Emmons	19	135	78	200		12,000	II,VII	G	Livona Dam---Long Lake Creek.	*****
20.	Emmons	25	132	75	200		11,000	III,IV	G	Dam---Beaver Creek.	**
21.	McLean	26	148	83	231		15,000	III,VII	G	Hammel Dam---Snake Creek.	*****
22.	McLean	21	149	85	366		20,000	III	G	Dam---Douglas Creek.	*****
23.	McKenzie	11	151	96	96		4,000	IV	F	Dam---Creek.	*****
24.	Mercer	33	147	90	50		3,000	IV	F	Dam---Creek.	*
25.	McKenzie	18	149	94	60		4,000	IV	F	Dam---Couleco.	*

PROPOSED IMPROVEMENTS IN USE OF SURFACE WATER RESOURCES

TABLE D (Cont'd.)

MISSOURI RIVER BASIN

Plate II Map No.	County	Sec.	Twp.	Rge.	Stg. Cap.- A. F.-Est.	Irr. Land Acres Est.	Cost Est.	Use	Designation	Description and Remarks	Survey
26.	Entire Basin						\$ 15,000			Survey of small dams proposed for flood irrigation, recreation, and waterfowl refuge purposes. Survey of available water resources for stock watering where present supplies are inadequate or unsatisfactory. Recommendations to be made for the most satisfactory and economical solution of the problem through the construction of community wells or surface reservoirs.	*

Total Class "A" Projects: 5,064 34,750 \$822,100

CLASS "B" PROJECTS DEMANDING IMMEDIATE ATTENTION UPON COMPLETION OF SURVEY:

5.	Burleigh	138	80	10,000	310,000	II	G		Construction of Bismarck pumping project.	*****
6.	Williams	154	96	16,500	330,000	II	G		Construction of Nesson Valley pumping project.	*****
7.	McLean	147 148	85 85	20,000	600,000	II	G		Construction of Fort Stevenson Flats pumping project.	*

TABLE D (Cont'd.) PROPOSED IMPROVEMENTS IN USE OF SURFACE WATER RESOURCES

MISSOURI RIVER BASIN

Plate II Map No.	County	Sec.	Twp.	Rge.	Storage Cap.- A. F.-Est.	Irr. Land Acres Est.	Cost Est.	Use	Designation	Description and Remarks	Survey
8.	McLean	149	90	90	5,000	10,000	\$400,000	II	G	Construction of Deepwater Creek Reservoir and pumping project on Deepwater Creek and the Missouri River.	*
9.	McLean	150	91	91		18,000	555,000	II	G	Construction of Shell Creek pumping project at confluence of Shell Creek with Missouri River.	*
10.	Oliver	143 144	81 82	81 82		1,000	25,000	II	G	Construction of Sanger pumping project.	*
27.	Oliver	13	143	82	2,000		25,000	II	F	Construction of reservoir on a creek to supplement the Sanger pumping project if feasible.	*
Total Class "B" Projects:					7,000	76,000	2,245,000				
<u>CLASS "C" PROJECTS IN PLAN NOT INCLUDED IN CLASSES "A" AND "B":</u>											
28.	McLean	149	90	90		1,000	31,000	II	F	Survey (and construction if feasible) of Independence pumping project on both sides of Missouri River.	*
		150	91	91							

TABLE D (Cont'd.) PROPOSED IMPROVEMENTS IN USE OF SURFACE WATER RESOURCES

MISSOURI RIVER BASIN

Plate II Map No.	County	Sec.	Twp.	Rge.	Storage Cap.- A. F.-Est.	Irr. Land Acres Est.	Cost Est.	Use	Designation	Description and Remarks	Survey
29.	Mountrail	151	151	91	2,000	\$21,000	II	F		Survey (and construction if feasible) of Shell Creek diversion project.	*
30.	Mountrail	152 153	152 153	93 92	2,000	62,000	II	F		Survey (and construction if feasible) of Black's Ranch pumping project at confluence of the Little Knife River with the Missouri.	*
31.	McLean	145	145	84	1,000	31,000	II	F		Survey (and construction if feasible) of Stanton Flats pumping project.	*
32.	Emmons	135	135	78	4,000	84,000	II	F		Survey (and construction if feasible) of Livona irrigation project.	*
33.	Emmons	132	132	79	1,000	33,000	II	F		Survey (and construction if feasible) of Beaver Creek Flats pumping project.	*
34.	Emmons	25	132	75	500	11,000	II	F		Survey (and construction if feasible) of Beaver Creek Basin diversion and flood irrigation project.	*

TABLE D (Cont'd.)

PROPOSED IMPROVEMENTS IN USE OF SURFACE WATER RESOURCES

MISSOURI RIVER BASIN

Plate II Map No.	County	Sec.	Twp.	Rge.	Storage Cap.- A. F.-Est.	Irr. Land Acres Est.	Cost Est.	Use	nation	Design-	Description and Remarks	Survey
35.	Mountrail	31	154	92	3,000	1,000	\$ 43,000	II	F	F	Survey (and construction if feasible) of the Gibbs Ranch reservoir and pumping project. Reservoir is to store the output from a 1500 G. F. M. spring.	*
36.	Emmons	130	79	79	5,000	5,000	110,000	II	F	F	Survey (and construction if feasible) of the Winona Flats pumping project.	*
37.	Emmons	129 129	78 79	79	2,500	2,500	55,000	II	F	F	Survey (and construction if feasible) of the Emmons County pumping project. Project would extend into South Dakota so cooperation by that state would be needed.	*
38. (a)	Burleigh	24	139	79	5,000	3,000	105,000	II	F	F	Survey (and construction if feasible) of Apple Creek reservoir and gravity flow irrigation works.	*
38. (a)	Burleigh	27 34	138 138	80 80	(8,000)	(3,500)		II	F	F	Alternate location for No. 38. In this location the reservoir would supplement the Bismarck pumping project No. 5.	*

TABLE D (Cont'd.)

PROPOSED IMPROVEMENTS IN USE OF SURFACE WATER RESOURCES

MISSOURI RIVER BASIN

Plate II Map No.	County	Sec.	Twp.	Rge.	Storage Cap. A. F.-Est.	Irr. Land Acres Est.	Cost Est.	Use	Designation	Description and Remarks	Survey
39.	Morton		140	81	3,500	3,500	\$140,000	II	F	Survey (and construction if feasible) of Square Butte Creek reservoir and irrigation project including gravity flow works and pumping equipment on Missouri River for supplementing the reservoir storage.	*
40.	Morton		138 139	80 81		3,000	90,000	II	F	Survey (and construction if feasible) of Mandan Flats pumping project.	*
41.	Morton		135 136	79 79		2,000	60,000	II	F	Survey (and construction if feasible) of Fort Rice pumping project.	*
42.	Mountain		156	94	10,000	5,000	109,000	II	F	Survey (and construction if feasible) of White Earth River reservoir and irrigation project.	*
43.	Williams	32	158 159	99 100	12,000	6,000	300,000	II	F	Survey (and construction if feasible) of Little Muddy Creek reservoir and irrigation project.	*
44.	McLean		145 146 147	84 84 84		6,000	183,000	II	F	Survey (and construction if feasible) of additional irrigation works for irrigating second bench lands in vicinity of Stanton Flats pumping project (No. 31).	*

TABLE D (Cont'd.)

PROPOSED IMPROVEMENTS IN USE OF SURFACE WATER RESOURCES

MISSOURI RIVER BASIN

Table II Map No.	County	Sec.	Twp.	Rge.	Storage Cap. A. F. Est.	Irr. Land Acres Est.	Cost Est.	Use	Design nation	Description and Remarks	Survey
5.	McLean	27	149	90	35		\$ 2,000	IV	F	Dam---Charging Creek on open range.	*
6.	Williams	34	157	100	100		5,000	II, III	E	Dam---Little Muddy Creek.	*
7.	Williams	22	158	98	100		5,000	III	G	Dam---Little Muddy Creek.	*
8.	Divide	8	162	102			1,000	V, IV	E	Develop springs.	*
9.	Mountrail	22	153	91	1,000		5,000	IV	F	Dam---Coulee.	*
10.	Mountrail	28	152	92	60		2,500	IV	F	Dam---Coulee.	*****
11.	Mountrail	10	154	89	4,000		1,000	III	F	Dam---Outlet of Lake McAlmond.	**
12.	Mountrail	9	153	88	40		5,000	IV	F	Dam---Conserve flow of spring fed creek.	**
13.	Sioux	21	131	80	1,000		40,000	III, IV	E	Dam---Porcupine Creek. Standing Rock ICE falling & cooperate.	*****
14.	Sioux	6	129	79	20		2,000	II	G	Dam---Creek for subsistence garden projects.	*
15.	Williams	9	158	101	100		5,000	III	F	Dam---Creek.	**
16.	Williams	30	157	98	75		10,000	IV	F	Dam---East Branch of Little Muddy Creek.	*****
17.	Williams	23	153	103	40		5,000	II, IV	F	Dam---Ottertail Creek.	**

TABLE D (Cont'd.) PROPOSED IMPROVEMENTS IN USE OF SURFACE WATER RESOURCES

MISSOURI RIVER BASIN

Plate II Map No.	County	Sec.	Twp.	Rge.	Storage Cap.-- A. F.--Est.	Irr. Land Acres Est.	Cost Est.	Use	Designation	Description and Remarks	Survey
58.	Williams	5	154	95	50		\$7,000	III	E	Dam--Creek.	**
59.	Williams	10	153	102	800		35,000	II	E	Dam--Painted Woods Creek.	**
60.	Williams	28	158	97	50		5,000	III	E	New Home Dam--Creek.	*
61.	Williams	36	155	104	100		6,000	III	F	Hebron Twp. Dam--Creek.	*****
62.	Williams	16	155	98	75		4,000	III	F	Brooklyn Twp. Dam--Creek.	*****
63.	McKenzie	35	152	98	40		4,000	IV	E	Dam--Tobacco Gardens Creek.	*
64.	Emmons		136	74	100		1,000	VII	F	Dam--Goose Lake Outlet	*
65.	Emmons	6	135	77	25		2,000	IV	F	Badger Creek Dam.	*
66.	Burleigh	7	140	80	36		7,700	IV	G	Dam--Creek.	*****
67.	Sioux	21	130	80	20		3,000	II	E	Dam--Creek.	*
68.	Burleigh	4	138	77	2,000		5,000	VII	F	Dam--McKenzie Slough.	*
69.	Oliver	35	141	82	18		1,000	II,IV	E	Kiebert Dam--Square Butte Creek.	**
70.	Williams	18	158	100	100		5,000	II	E	Dam--Little Muddy Creek.	**
71.	McIntosh	5	131	70	2,240		5,000	III,VII	F	Dam--Lake Outlet.	*****
72.	Williams	17	157	101	32		7,000	IV	F	Dam--Coulee.	**
73.	Mountrail	19	155	91	25		3,000	II	E	Dam--Little Knife River.	**

TABLE D (Cont'd.)

PROPOSED IMPROVEMENTS IN USE OF SURFACE WATER RESOURCES

MISSOURI RIVER BASIN

Plate II Map No.	County	Sec.	Twp.	Rge.	A. F.-Est.	Storage Cap.- Irr. Land Acres	Land Est.	Cost Est.	Use	nation Design	Description and Remarks	Survey
(26).	Entire Basin							\$100,000			Construction of community wells * for stock watering and the con- struction of surface water resources in certain communities after surveys have shown that ground water re- sources in the areas are unsatisfactory. Possible reservoir sites are: Williams County, Twp. 156-101, Twp. 156-102, Twp. 156-103, S 14-159-95, S 16-159-98, S 15-157-101, and S 8-155-100; Divide County, S 27-160-101, S 13-163-102, S 10-162-101, S 16-162-101, S 6-162-101, S 13-161-102, S 4-160-98, and S 33-160-96; Emmons County, S 36-127-78, S 1-134-74, S 13-130-75, S 21-130-76, S 32-133-77, S 18-132-75, S 6-135-76, S 11-135-78, S 22-135-75, S 11-131-75, S 4-130-74, S 30-129-76, S 26-129-77, S 7-133-75, S 5-135-77, S 32-133-77, and S 36-129-78; McIntosh, S 30-131-67, and S 14-131-71; Sioux County, S 9-130-82, S 12-130-82, S 36-133-81, and S 23-129-82; Morton County, S 36-137-83; Burleigh County, S 12-140-75, S 6-142-75, S 31-142-78, and S 26-138-75; and McLean County, S 10-149-89 and S 36-150-89.	

Total Class "C" Projects: 46,281 49,000 \$1,757,200

TOTAL PROPOSED IMPROVEMENTS
IN USE OF SURFACE WATER RE-
SOURCES:

58,345 159,750 \$4,824,300

TABLE D (Cont'd.)

PROPOSED IMPROVEMENTS IN USE OF SURFACE WATER RESOURCES

MISSOURI RIVER BASIN

SURVEY:	USE:
*	II Irrigation
**	III Recreation
****	IV Stock Watering and Water Conservation
*****	V Municipal Water Supply
*****	VII Waterfowl Refuge

DESIGNATION:

- E Excellent
- G Good
- F Fair
- P Poor

TABLE E PROPOSED IMPROVEMENTS IN STREAM GAGING AND WEATHER OBSERVATION FACILITIES
MISSOURI RIVER BASIN

PLATE III 1-17-70	Station	New or Rehabilitated	Type of Station	Reading to be Taken	Cost Estimated
<u>CLASS "C" PROJECTS IN PLAN NOT INCLUDED IN CLASSES "A" AND "B":</u>					
1.	Stanley	New	Cooperative	Temperature and precipitation	\$ 50
2.	Center	New	Cooperative	Temperature and precipitation	50
3.	Carlson	New	Cooperative	Precipitation	15
4.	Garrison	New	Bureau of Air Commerce	Temperature, Precipitation, and barometric pressure	300

\$ 415

TOTAL PROPOSED IMPROVEMENTS IN STREAM GAGING AND WEATHER OBSERVATION FACILITIES:

TABLE F

PROPOSED PROJECTS

MISSOURI RIVER BASIN

SUMMARY

CLASS "A" PROJECTS DEMANDING IMMEDIATE ATTENTION:

Proposed Improvements in Water Supply	\$ 325,350
Proposed Improvements in Sewage Disposal	140,000
Proposed Improvements in Use of Surface Water Resources	822,100

Total Class "A" Projects

\$ 1,587,450

CLASS "B" PROJECTS DEMANDING IMMEDIATE ATTENTION UPON COMPLETION OF SURVEY:

Proposed Improvements in Water Supply	29,400
Proposed Improvements in Use of Surface Water Resources	2,245,000

Total Class "B" Projects

2,274,400

CLASS "C" PROJECTS IN PLAN NOT INCLUDED IN CLASSES "A" AND "B":

Proposed Improvements in Water Supply	335,000
Proposed Improvements in Sewage Disposal	375,000
Proposed Improvements in Use of Surface Water Resources	1,757,200
Proposed Improvements in Stream Gaging and Weather Observation Facilities	115

Total Class "C" Projects

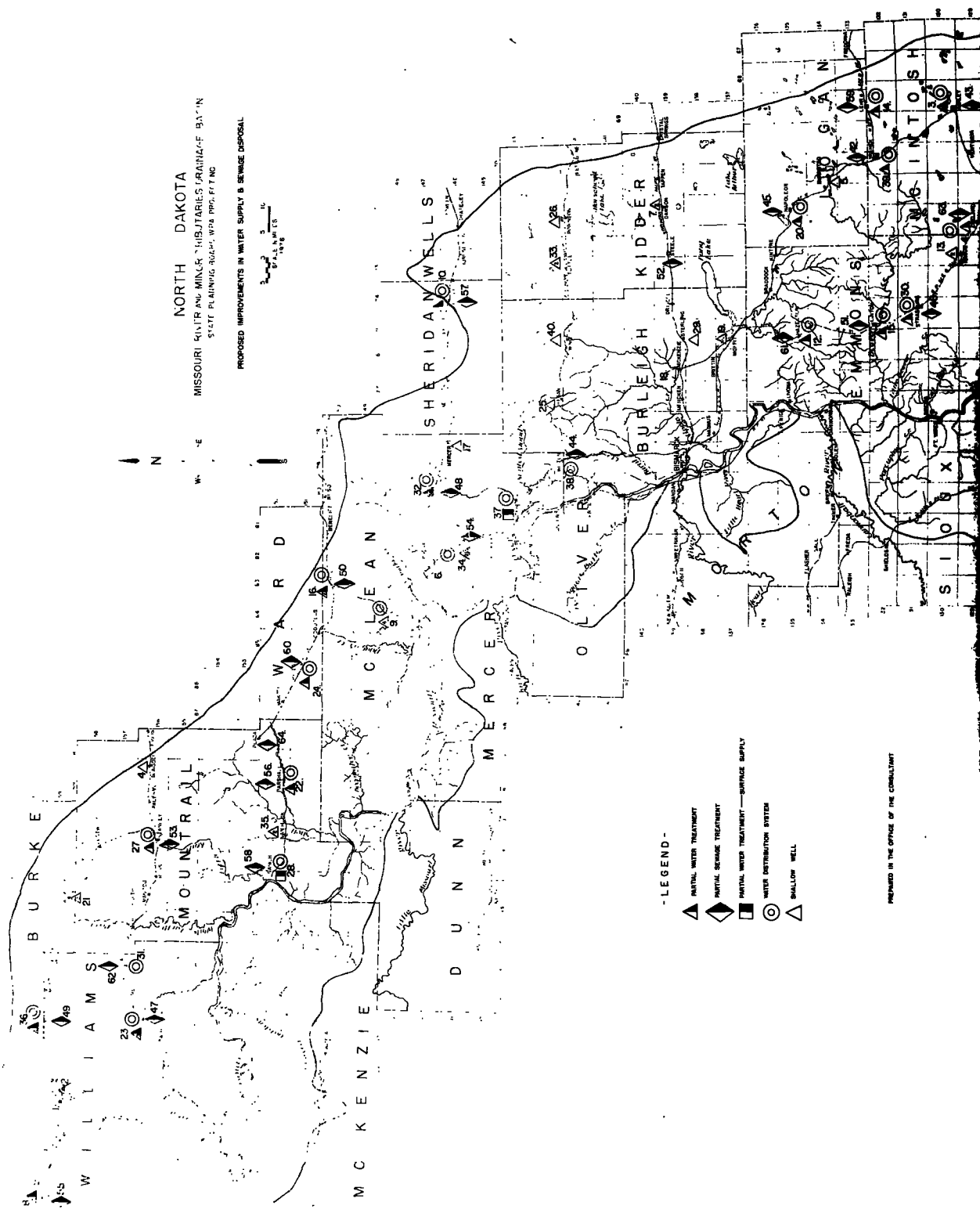
2,467,615

TOTAL PROPOSED PROJECTS:

\$ 6,329,465

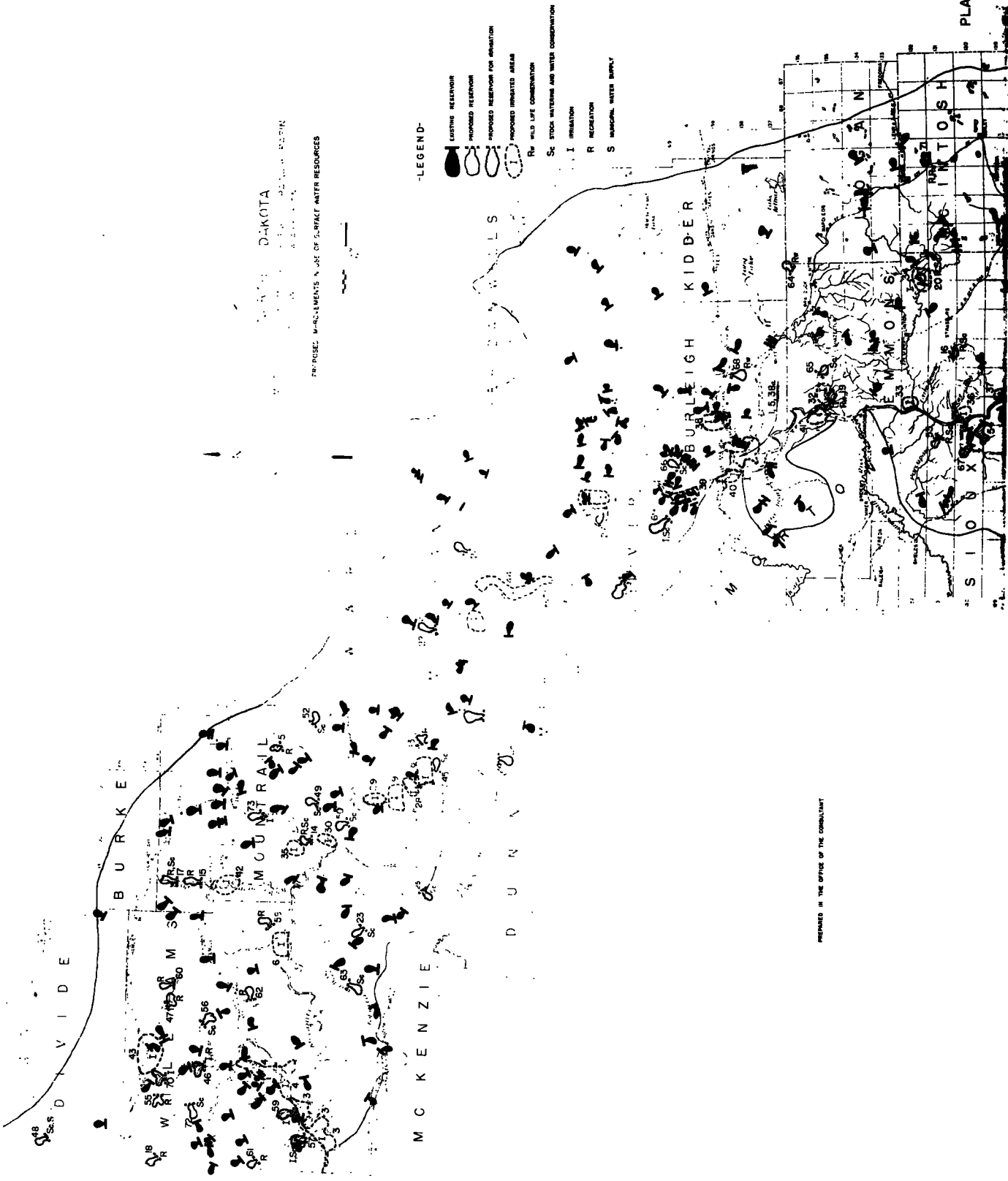
NORTH DAKOTA
MISSOURI CENTER AND MILK SUBSTITUTES PARALLEL BAYON
SECT. PLANNING, 1964-65; WPA PWD, FITC

PROPOSED IMPROVEMENTS IN WATER SUPPLY & SEWAGE DISPOSAL



- LEGEND -
- ▲ PARTIAL WATER TREATMENT
 - ◆ PARTIAL SEWAGE TREATMENT
 - PARTIAL WATER TREATMENT - SEWAGE SUPPLY
 - WATER DISTRIBUTION SYSTEM
 - △ SHALLOW WELL

PREPARED IN THE OFFICE OF THE CONSULTANT



DAKOTA

PREPARED BY MCKEON'S AGENCY OF SURFACE WATER RESOURCES

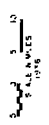
LEGEND

- EXISTING RESERVOIR
- PROPOSED RESERVOIR
- PROPOSED RESERVOIR FOR IRRIGATION
- PROPOSED IRRIGATED AREAS
- W WILD LIFE CONSERVATION
- Sc STOCK WATERING AND WATER CONSERVATION
- I IRRIGATION
- R RECREATION
- S MAJOR WATER SUPPLY

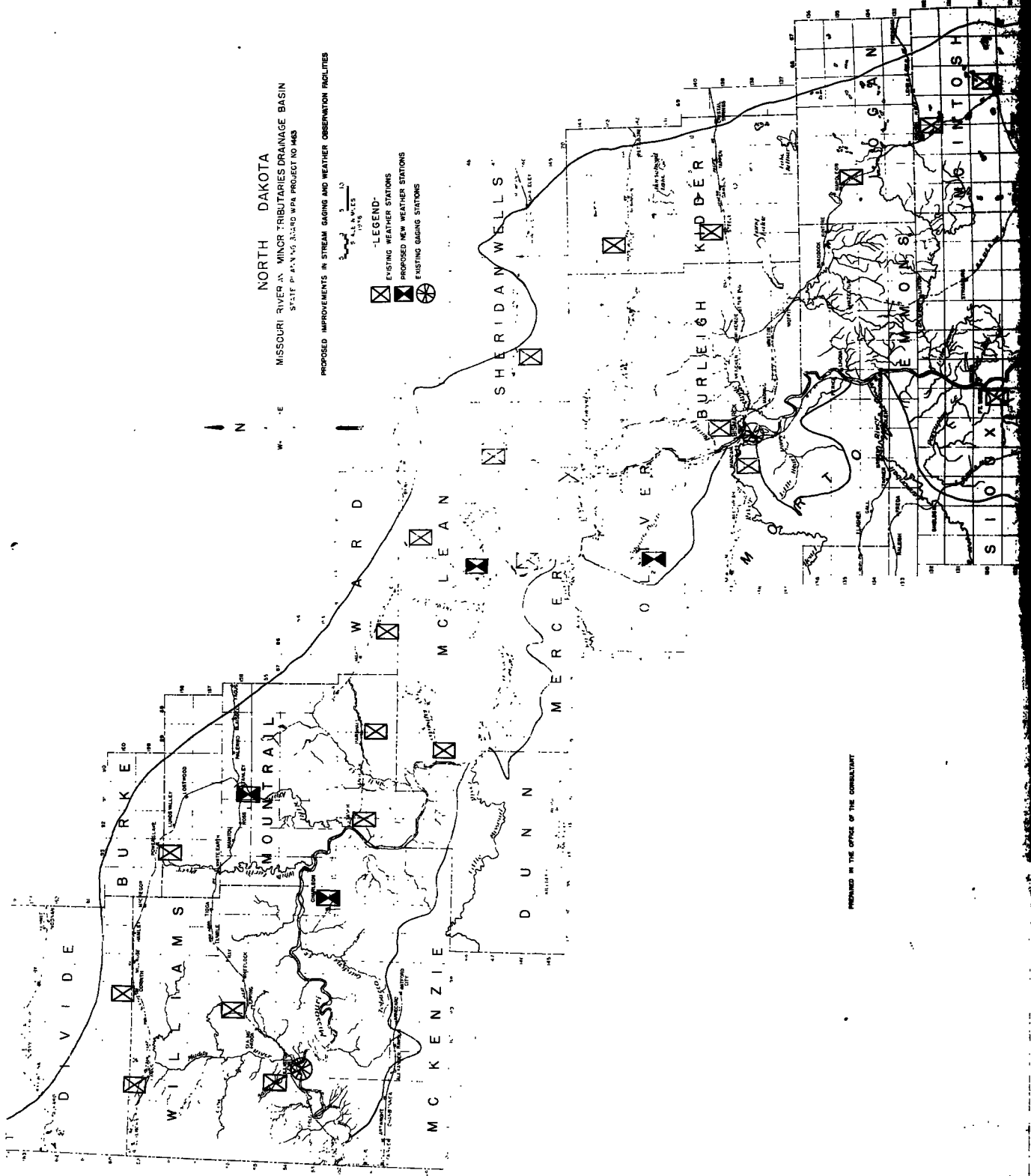
PREPARED IN THE OFFICE OF THE CONSULTANT

NORTH DAKOTA
MISSOURI RIVER AND MINOR TRIBUTARIES DRAINAGE BASIN
STATE PLANNING BOARD WPA PROJECT NO 4483

PROPOSED IMPROVEMENTS IN STREAM GAGING AND WEATHER OBSERVATION FACILITIES



- LEGEND-
- ☒ EXISTING WEATHER STATIONS
 - ☒ PROPOSED NEW WEATHER STATIONS
 - ☒ EXISTING GAGING STATIONS



PREPARED IN THE OFFICE OF THE CONSULTANT

NORTH DAKOTA
STATE PLANNING BOARD

SUMMARY REPORTS
OF
A PLAN OF WATER CONSERVATION
FOR
NORTH DAKOTA

- Volume 1 Letter of Transmittal
Forward
Red River of the North Drainage Basin
- Volume 2 James River Drainage Basin
- Volume 3 Souris River-Devils Lake Drainage Basins
- Volume 4 Main Stem Missouri River Basin
- Volume 5 Slope Area Drainage Basins