nebraska energy conservation plan

SMALL HYDROELECTRIC POTENTIAL IN NEBRASKA:

AN INVENTORY OF EXISTING DAM SITES IN THE STATE

Progress Report Number Two

March, 1981

Prepared by the Nebraska Energy Office under a grant from the U.S. Department of Energy, Region VII, as authorized under Title IV, Public Utilities Regulatory Policy Act of 1978, P.L. 95-617.

INVENTORY OF EXISTING HYDROELECTRIC DAM SITES IN NEBRASKA

Introduction

The U.S. Department of Energy, Region VII, Kansas City, Missouri, has provided a small federal grant to the Nebraska Energy Office for the purpose of reporting the status of hydroelectric generation in the State, and to prepare an inventory of existing dam sites that have the potential of generating up to 30 megawatts of power.

This progress report under the grant is the second of three documents to be prepared. It surveys the history of hydroelectric generation in the State, reviews analytic work prepared by the U.S. Corps of Engineers (under the National Hydroelectric Development Feasibility Study), reports on a previous hydro feasibility study for the Big Blue River, and offers a draft inventory of existing hydro sites with expanded data provided by state and federal agencies.

The final report will complete the information assembly for the inventory of dam sites in the State. It will also identify some significant issues related to small-scale hydroelectric development in Nebraska for 1981 and activity that proposes to address the same.

Status of Hydroelectric Generation in Nebraska

In 1970, there were 20 operative hydroelectric plants in Nebraska, excluding the federal installation at Gavins Point Dam on the Missouri River which is intertied with the Missouri River Basin Project power and transmission system. The individual capacity of ten of these plants was less than one megawatt each. Their combined output totalled only 3.3 megawatts. Four other plants had capacities from one to five megawatts totalling 10.1 megawatts of capacity. The other six plants had capacities from 8.25 to 40 megawatts, producing a combined total of about 128 megawatts.

These 20 plants had individual rights to divert streamflow ranging from 35 to 3,500 cubic feet per second (cfs). Total rights for diversion amount to 16,070 cfs, including 68 cfs for the two small plants that are inoperative. The locations of these existing hydroelectric plants and some of their characteristics are shown in the draft inventory contained at the end of this report.

The Framework Study

The Study, prepared by the Nebraska Soil and Water Conservation Commission in May, 1971, after reporting on the 22 existing plant sites described above, drew the following conclusions:

"Hydroelectric power generation in the State is being replaced by other methods. In recent years the cost of generating electricity at hydroelectric plants has also increased, resulting in phasing out of a number of small plants.

No new hydroelectric plants have been built in the State since 1941 because of the lack of feasible sites and increased costs. Dams and power plants more recently have been build on the Missouri River where high flows were available and where power was only one purpose of the overall project.

The importance of hydroelectric generation within Nebraska is likely to continue to decline. The Nebraska Power Industry Committee (NPIC), composed of representatives of many of the State's subdivisions which supply power recently established a committee to study the industry and investigate generation and transmission facilities which might be needed in the future. The construction of new hydroelectric plants was not assigned any consideration in those studies, and of the existing hydroelectric facilities, none were mentioned beyond the 1980's in future plans.

The six largest hydroelectric power plants in the State are licensed by the Federal Power Commission (now the U.S. Department of Energy Western Area Power Administration) and have a total generating capacity of only 128 megawatts. No plans were proposed for their expansion. The NPIC has estimated that the statewide demand for power will reach 8,950 megawatts by 1990, when these six plants will be about 50 years old and the Federal Power Commission licenses will expire. Their output will be only 1.4 percent of the estimated 1990 demand, declining to 0.8 percent of the demand by the end of the century.* Repairs and replacement will probably be uneconomical and the plants will likely be phased out."

The Framework Study, also known as State Water Plan, Publication Number 101, viewed both water problems for hydro plants and the economic future for further hydro development gloomily. Its analysis concludes:

*For 1978, actual electrical capacity was 3,889 megawatts of which 189.40 (or 4,87%) was attributed to hydro units.

> "Power is an industry, and as an industry it has third preference in the use of water supplies.....domestic and agricultural uses having higher preference. This has caused a conflict in the recent past when applications for the storage and use upstream of water presently being used for downstream hydroelectric power generation have been made for a higher preference use. Water reserved for hydropower generation downstream cannot be taken and used consumptively for irrigation and other agricultural and domestic purposes upstream unless the hydropower producers are reimbursed for damage suffered through loss of power production. As the development of water resources continues, problems concerning present power rights will likely increase.
>
> The demand for electrical energy is not constant. .....peak demands are satisfied most easily with energy generated by hydroelectric power plants that can rapidly vary their energy output. However, existing plants in Nebraska are unable to meet present peaks and virtually no additional suitable sites remain in the State for economical hydroelectric power production under current economic criteria."

All of this evaluation was made, of course, before the petroleum embargo of 1973 created serious energy supply concerns and rapidly escalating liquid fuel prices made existing hydro sites much more attractive as energy sources.

National Hydropower Study

The National Hydropower Study, created by the Water Resources Development Act of 1976, sought:

> "...to study the most efficient methods of utilizing the hydroelectric power resources at water resource development projects under the jurisdiction of the Secretary of the Army, and to prepare a plan based upon the findings of such study."

The objectives have been to:

1. Define the needs for hydroelectric power.
2. Assess the potential for increasing hydropower.
3. Determine the feasibility of increasing capacities through new sites, added generation facilities, and uprating existing systems.
4. Analyze current institutional and policy setting
5. Assess environmental and socio-economic impacts.
6. Recommend to Congress a national hydroelectric power development program.

Under the Study, hydroelectric generation was seen as a substantial contribution to solving the nation's energy shortage by fully utilizing the power potential of streams and rivers. The production of electricity from flowing water dates back to 1882 when the first hydroelectric plant was build on the Fox River at Appleton, Wisconsin. Since then, the inventory of hydroelectric facilities owned and operated by electric utilities, federal and state agencies and other producers has grown to 1,145 plants with a yearly output of 221 billion kilowatt hours and a capacity of 68,294 megawatts.

The Study was assigned to the U.S. Army Corps of Engineers, a hydropower builder and producer for 70 years, which now furnishes about 26% of the nation's hydroelectric capacity. The Institute for Water Resources, Fort Belvoir, Virginia, is managing the study, scheduled for completion by the fall of 1981.

The Study has been divided into two major elements.

a. A comprehensive inventory of hydropower resources across the nation, plus projected regional demands for hydropower through the year 2000.

b. The identification of socio-economic, environmental, institutional and other policy issues affecting hydropower developments.

The draft document prepared by the Corps in September, 1980, narrowed the field of study from 115 Nebraska sites originally identified as having hydro potential, to three recommended for serious consideration. The original 115 sites are included in the draft inventory at the end of this report. The 3 sites showing sufficient potential to merit feasibility work are

1. Merritt Dam in Cherry County, southwest of Valentine on the Snake River:

   An analysis of this facility has been completed by the Water Power Resources Services. A portion of that analysis is included in Appendix "A" of this report.

   It has no present hydro facility.

2. The Calamus River in Garfield County, near Burwell on the upstream (west) side:

   It is now in construction primarily as an irrigation irrigation project, without hydroelectric facilities included.

3. The proposed Norden Dam on the Niobrara River:

   This site continues under study by the Water Power Resources Service of the U.S. Department of the Interior, for the purpose of evaluating hydroelectric potential.

Because the draft document recently released by the Corps focuses on such a small number of Nebraska sites, the document has not been reproduced here nor made the subject of further examination. The computer analysis performed for the original 115 sites, paying special attention to sites having the potential of over 50 MW, has also not been evaluated. Rather, all 115 sites have been included in the draft inventory so that their small-scale hydro potential could be studied under criteria far different in scale and scope than those used in the Corps study.

Big Blue River Hydroelectric Study

The Big Blue River Co-Dependent Hydroelectric Development Study was jointly funded by the U. S. Department of Energy and the Nebraska Municipal Power Pool in early 1979. The proposed development comprised a series of seven existing dams on a 65-mile stretch of the Big Blue River in southern Nebraska, running roughly southeast from Crete to the Kansas state line south of Barneston. All seven site owners cooperated in the study although all of them subsequently declined to seek further federal funds for design or development. The objective of the study was to establish technical and economic feasibility for developing hydroelectric power potential at the seven sites.

The project was found to be a technically feasible concept. The proposed redevelopment would have included seven installations with a recommended nominally rated capacity of 3,920 KW. The average annual gross generation expected from the seven sites was expected to be 11,555,000 KWh. It was estimated that the cost of redevelopment (at 1979 price levels) was slightly over $14 million. Both the Feasibility Report and the second volume of Appendices have been reproduced and were included with the first phase of this Report.

The Nebraska Municipal Power Pool has reported to the Energy Office that there is continued interest for development of one or more of the studied sites. In addition, other municipalities have expressed willingness to seek federal funds for future feasibility studies. A letter from the Power Pool is included in this Report at Appendix "B". A more thorough analysis of municipal interest will be provided in the final report.

Proposed Statewide Hydroelectric Feasibility Study

The Nebraska Municipal Power Pool (NMPP) is proposing that a comprehensive analysis of the hydro potential be made by a consulting engineering firm for all existing hydro sites.

Their view is that a statewide study identifying the sites with greatest potential for restoration, ranked in priority based upon all relevant factors, will result in an immediate action plan for development of hydropower potential in the State (See Appendix "C"). A site-by-site analysis clearly produces far less information without the comparative aspects of the statewide study. In addition, the costs for site-by-site evaluation are much higher and achieve none of the economies of scale that a single statewide analysis could be expected to produce. Finally, the NMPP envisions a cooperative venture by the several State agencies having interest in water development projects. This parallel review of the study process, control over techniques for evaluation, and joint study of project results could be expected to produce a common plan for site development that has not previously existed for State water issues. The Energy Office endorses the proposed statewide study and, within the limit of rapidly disappearing federal conservation funds, will participate as a partner in the venture.

Proposed Legislation

Legislative Bill 132, presently on General File (first reading) in the 1981 Unicameral, and cited as the Municipal Cooperative Financing Act, provides (in section 2) for:

"cooperative action by cities and villages of this state in the fields of the supplying, treatment, and distribution of water, the generation, transmission, and distribution of electric power and energy, and the collection, treatment, and disposal of sewerage and solid waste is in the public interest; that there is a need in order to insure the stability and continued viability of such systems to provide for a means by which municipalities may cooperate with one another in the financing, acquisition, and operation of such facilities and interests therein and rights thereto in all ways possible; that the creation of agencies through which the municipalities of this state may act cooperatively is in the best interest of this state and the inhabitants thereof; and that the necessity in the public interest for the provisions included in this act is declared as a matter of legislative determination. It is further declared that the intent of this act is to replace normal competition between participating municipalities in connection with the projects described in this act by allowing such municipalities to combine and cooperate in connection with the acquisition, construction, operation, financing, and all other functions authorized by this act with respect to such projects."

The Governor has indicated his support of the Bill's intent in his "State-of-the-State" speech, and the Energy Office supports the concept as well. The progress of LB 132 will be indicated in the final report.

Interim Observations

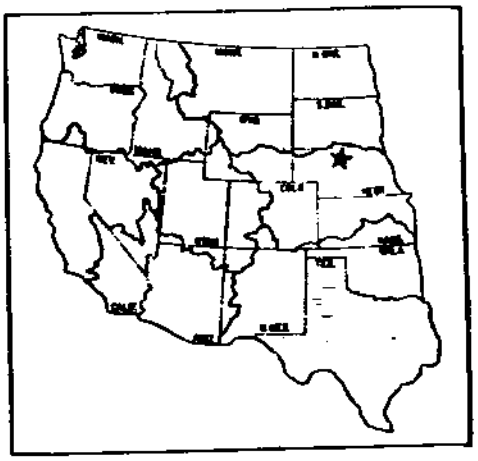
More than 100 existing hydro, recreation, irrigation, or flood control sites have been identified in the State (See the existing sites inventory at Appendix "D"). Because of their prior claim to precious water rights, because exisitng

facilities have fewer capital and environmental hurdles to overcome, and because energy alternatives are being sought on every hand, the sites need to be scrutinized very closely. The reporting of available information under the grant to the Nebraska Energy Office is a valuable first step in that necessary process. The final report under the grant is expected to be released to the Governor and the Unicameral in April, 1981.

Pick-Sloan Missouri Basin Program
Ainsworth Unit

Nebraska: Brown, Cherry, and Rock Counties

Lower Missouri Region
Water and Power Resources Service
(Formerly Bureau of Reclamation)

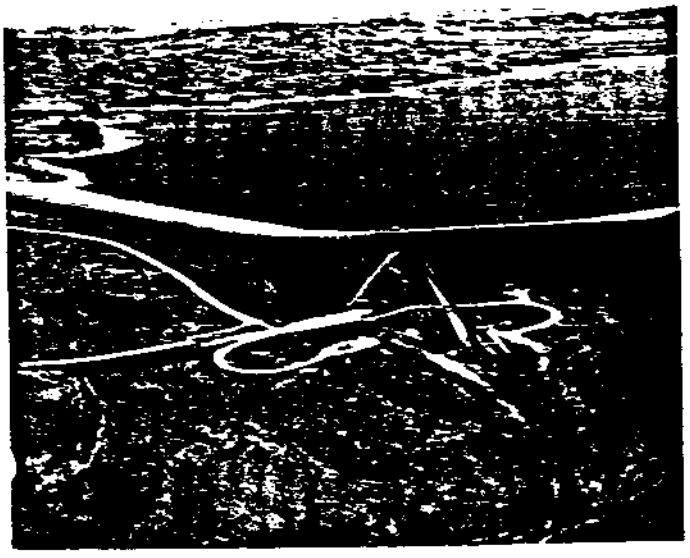


The Ainsworth Unit is located in north-central Nebraska. The storage facilities are on the Snake River approximately 14 miles upstream from its confluence with the Niobrara River, in Cherry County southwest of Valentine. The irrigable lands extend 22 miles from west to east and 14 miles from north to south, beginning near Johnstown and continuing eastward to a point near Long Pine, all in Brown and Rock Counties.

PLAN

The unit provides a full water supply for the irrigation of 33,960 acres of land in the Ainsworth Irrigation District. Project facilities include Merritt Dam and Reservoir, the Ainsworth Canal, a system of laterals, and surface and subsurface drains. Although essentially a single-purpose irrigation development, additional benefits accrue from recreation, fish and wildlife, and water quality control.

The water supply for the unit comes from the Snake River and is stored in Merritt Reservoir for timely release into the Ainsworth Canal, by which it is conveyed to project lands for irrigation. The Snake River originates in the Sandhills region of Nebraska, an area characterized by highly permeable sands and many closed basins. Precipitation falling into these basins seeps into the ground or ponds temporarily, and feeds the streams with a large, steady baseflow. Because of the underground flow, the total drainage area contribution to the Snake River above Merritt Dam is about 600 square miles. Of this, only 83 square miles contribute surface runoff. Average annual runoff was 184,600 acre-feet for the period 1947-62. Average annual irrigation diversion requirement to provide a full supply for the 33,960 irrigable acres is 102,000 acre-feet.



Merritt Dam

Merritt Dam and Reservoir

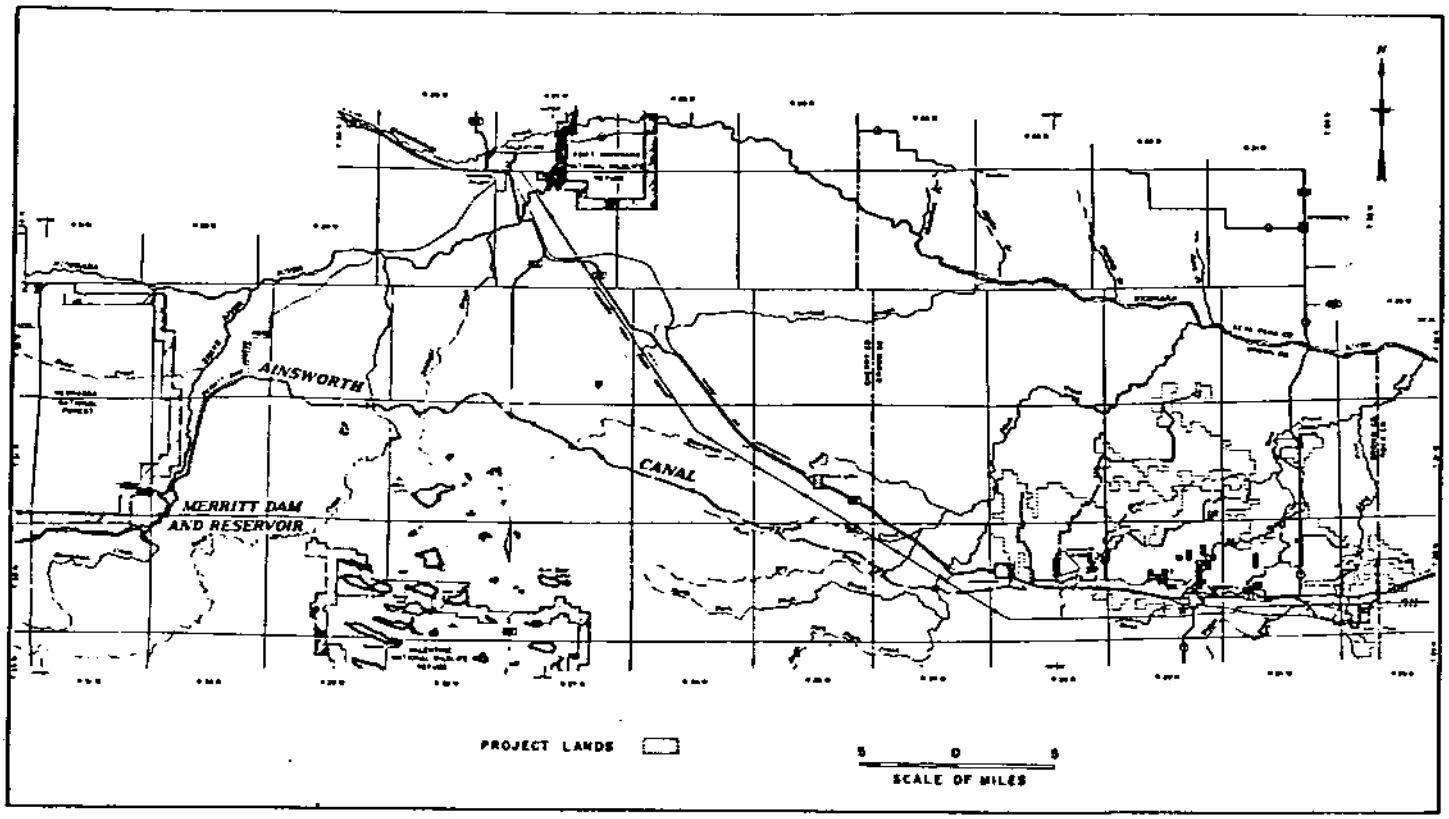
Merritt Dam has a structural height of 126 feet and a crest length of 3,222 feet. The zoned earthfill embankment consists of 1,548,000 cubic yards of material. It is the first Bureau of Reclamation earthfill dam to use soil cement instead of the traditional rock riprap to protect the upstream face.

The morning-glory ungated spillway protects the dam from damage by floods. It consists of a concrete intake structure, concrete conduit, concrete chute and stilling basin, and outlet channel. The spillway has a capacity of 2,080 cubic feet per second at water surface elevation 2949.8 feet.

A branched outlet works in the dam provides for diverting water to the Ainsworth Canal or for controlling releases to the Snake River through the stilling basin.

The canal outlet works consists of a 78-inch-diameter steel pipe, concrete control house for two 4-foot-square high-pressure gates, stilling basin, wave suppressor, gage house, and Parshall flume.

The river outlet works consists of a concrete intake structure, concrete conduit, gate chamber for one 5- by 6-foot high-pressure gate, access shaft and access house, a 54-inch-diameter steel pipe, control house for two 2.75-foot-square high-pressure gates, and a stilling basin.



Ainsworth Unit

Merritt Reservoir has a total capacity of 74,500 acre-feet at elevation 2946.0, an active conservation capacity of 67,686 acre-feet between elevations 2896.0 and 2946.0, and a surface area of 2,906 acres at elevation 2946.0.

Ainsworth Canal and Distribution System

The Ainsworth Canal originates at Merritt Dam outlet works and extends eastward through the Sandhills to the project lands. The canal is concrete lined for its entire length to minimize seepage losses in the sandy soils it traverses, is 52.9 miles long, and has an initial capacity of 580 cubic feet per second.

The lateral system which delivers the water to the project lands has a total length of 169.7 miles and the initial capacities range from 530 to 4 cubic feet per second. Five miles of surface water disposal drains and several disposal ponding areas have been constructed. Other surface water disposal and subsurface drainage facilities will be constructed as necessary.

DEVELOPMENT

Early History

Settlement of the territory was slow until 1860-70, when the Homestead Act of 1862, demobilization of Civil War veterans, establishment of military posts on the frontier, and completion in 1867 of a transcontinental railway running through Nebraska combined to stimulate settlement. By 1890, nearly all of the irrigable lands in the Ainsworth Unit area had been homesteaded.

Early interest in the possibilities of irrigation development in the Ainsworth area is evidenced by the recording of applications for water rights in the 1880's along the Niobrara River and its tributaries. Many of the developments were unsuccessful or did not materialize, mainly because of the inability of the farmers to finance the construction and maintenance.

Investigations

The Bureau of Reclamation began a comprehensive investigation of the land and water resources of the Niobrara River Basin in 1946 after local residents attended a public hearing at Valentine, Nebr., to present evidence and discuss possibilities of developments for irrigation, power generation, flood control, and other functions associated with water resource development. At this hearing, the people of the basin appealed to the Federal Government for assistance in investigating the opportunities for future development. A basin report dated June 1953 recommended that four units—Mirage Flats Extension, Lavaca Flats, O'Neill (excluding the proposed

ng Pine and Meadville Powerplants), and the Ainsworth Unit—be considered for development. Both engineering and economic reasons prompted the selection of the Ainsworth Unit for early construction.

Authorization

The Ainsworth Unit was authorized as an integral part of the Missouri River Basin Project on August 21, 1954, by Presidential approval of Public Law 612, 83d Congress, 2d session (68 Stat. 757).

Construction

Construction of Merritt Dam and Reservoir began in August 1961, and storage of water was started in February 1964. Construction of the dam was completed in May 1964, and the dam and reservoir were transferred from construction to operation and maintenance status on March 10, 1965.

Construction of the irrigation distribution system began in April 1962, was completed in June 1966, and was transferred to operation and maintenance status on September 1, 1966.

Operating Agencies

Merritt Dam and Reservoir, the Ainsworth Canal, and the laterals and drains are operated and maintained by the Ainsworth Irrigation District. The Nebraska Game and Parks Commission administers the recreation and fish and wildlife aspects of the reservoir.

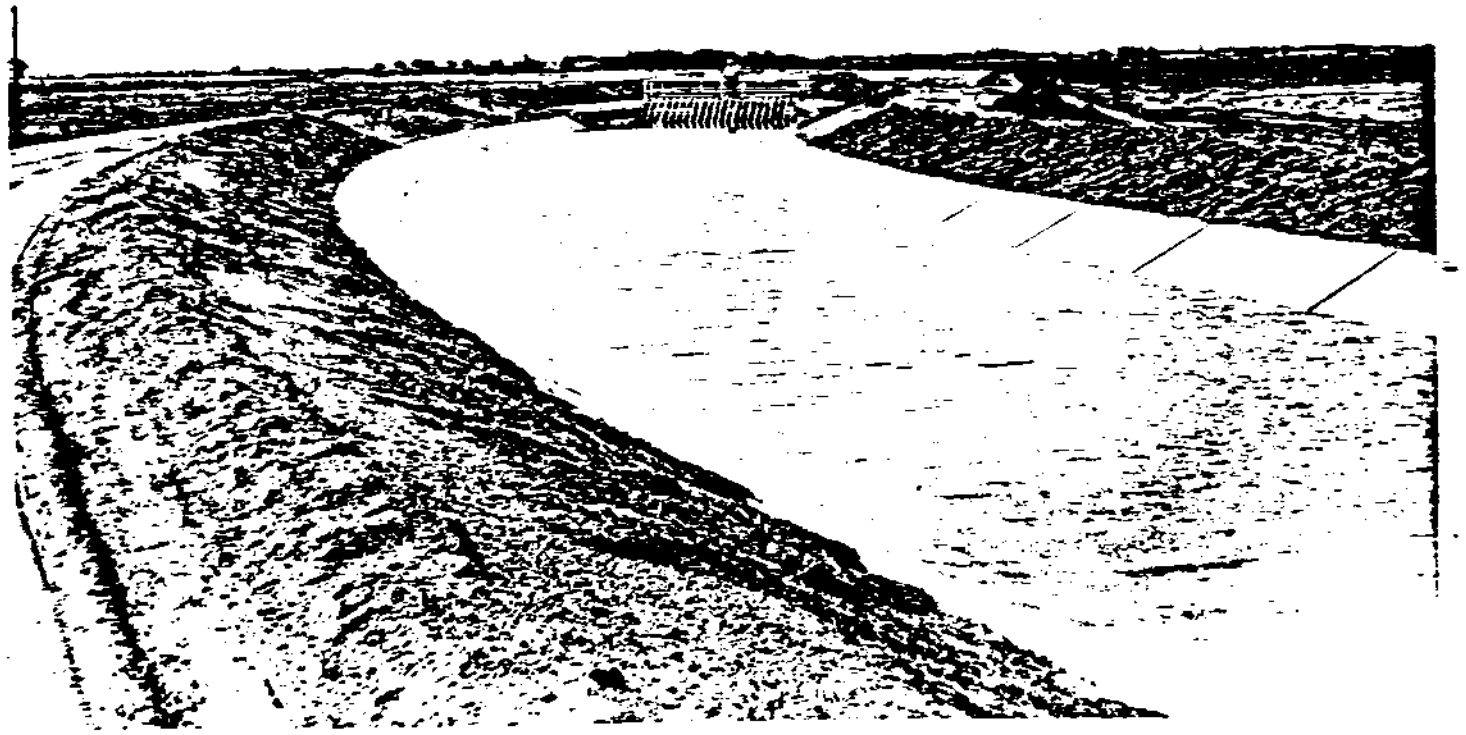
BENEFITS

Irrigation

The local economy had been almost entirely dependent upon dryland agriculture. After development of the unit, the predominant type of farming became a livestock-general crop pattern in which the major income is derived from livestock and its products. The principal crops being irrigated are feed grains, alfalfa, and small grains.

Recreation and Fish and Wildlife

An all-weather road provides access to Merritt Reservoir as well as picturesque Snake River Falls and to the downstream section of the Snake River.



Ainsworth Canal

Improvement of upland game bird habitat has increased the number of game birds in the area and the reservoir water surface attracts great numbers of waterfowl. Several varieties of game fish have been stocked in the reservoir. Opportunities for boating, water skiing, camping, and picnicking are plentiful during the warm summer months at Merritt Reservoir. Picnic and sanitary facilities, parking areas, and boat ramps have been provided to facilitate outdoor recreation.

PROJECT DATA

Land Areas (1977)

Irrigable area:		
Full irrigation service	34,539	acres
Number of irrigated farms	242	

Area Irrigated and Crop Value

Year	Area irrigated, acres	Crop value,[1] dollars
1968	21,144	2,451,602
1969	22,666	2,585,540
1970	28,175	3,333,430
1971	30,964	4,018,989
1972	28,200	4,467,718
1973	30,200	6,511,561
1974	32,537	9,922,584
1975	33,694	10,277,182
1976	33,934	9,664,380
1977	34,513	6,219,597

[1]Includes additional revenue.

Facilities in Operation

Storage dams	1	
Canals	52.9	mi
Laterals	169.7	mi

Climatic Conditions

Annual precipitation	21	in
Temperature:		
Maximum	112	°F
Minimum	−33	°F
Mean	49	°F
Growing season	157	days
Elevation of irrigable area	2300 to 2600.0	ft

Settlement

Number of persons served with project water (1977):	415	

ENGINEERING DATA

Water Supply

SNAKE RIVER

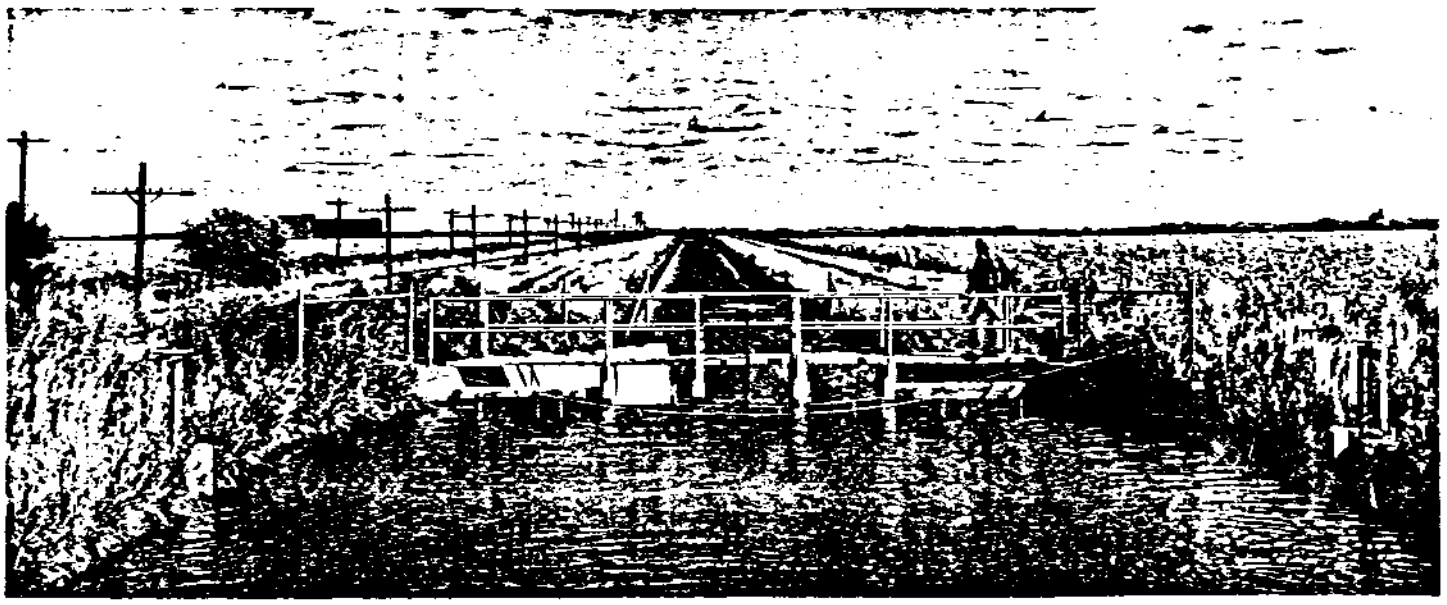
Drainage area above Merritt Dam	600	mi²
Average annual discharge at Merritt Dam	151,658	acre-ft
Maximum (1973)	185,054	acre-ft
Minimum (1970)	96,475	acre-ft
Estimated average annual diversion to project lands	64,488	acre-ft

Storage Facilities

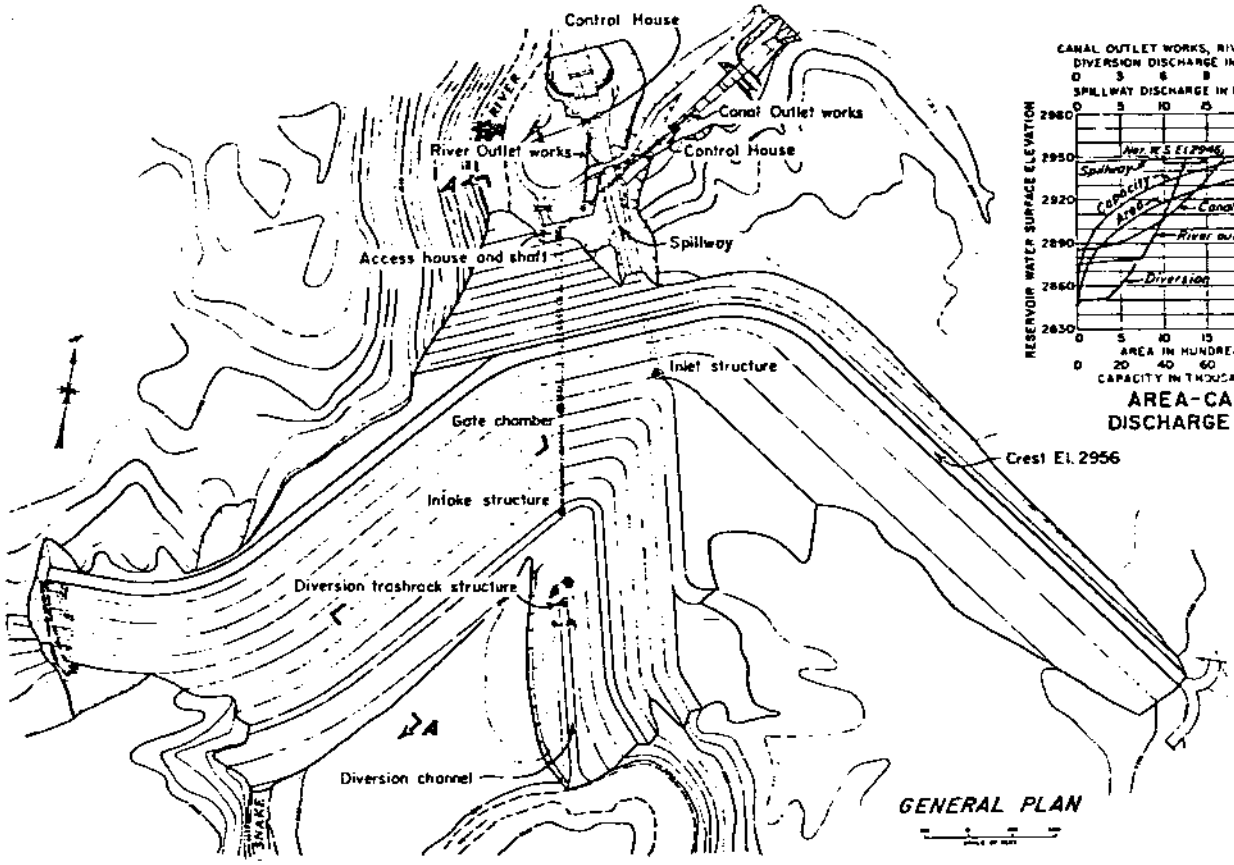
MERRITT DAM

Type: Zoned earthfill
Location: On Snake River 14 mi upstream from the confluence of the Snake and Niobrara Rivers
Construction period: 1961-64

Reservoir, Merritt:		
Average annual inflow	166,102	acre-ft
Total capacity to El. 2946	74,486	acre-ft
Active capacity, El. 2896-2946	67,686	acre-ft
Surface area	2,906	acres
Dimensions:		
Structural height	126	ft
Hydraulic height	111	ft



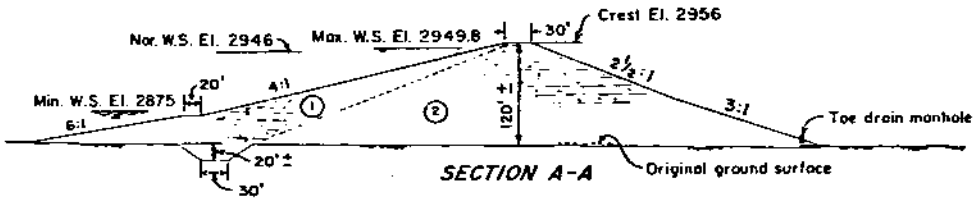
Bone Lateral



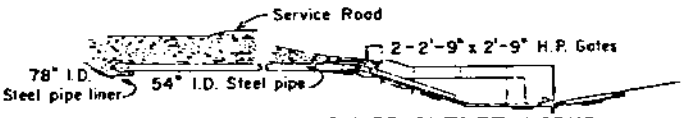
AREA-CAPACITY-DISCHARGE CURVES

EMBANKMENT EXPLANATION

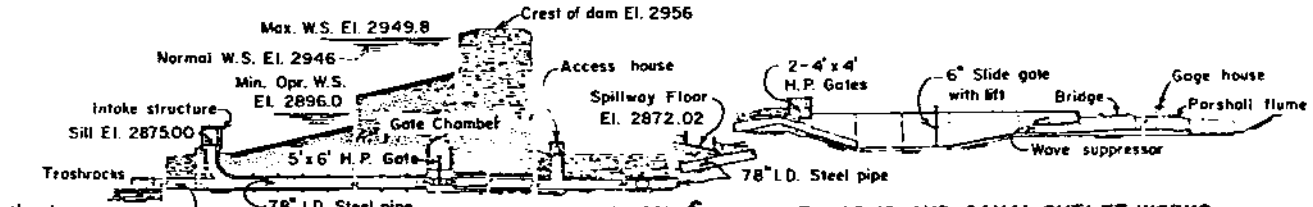
1. Selected silt and sand compacted by tamping rollers to 6-inch layers.
2. Selected sand compacted by crawler-type tractor to 6" layers.



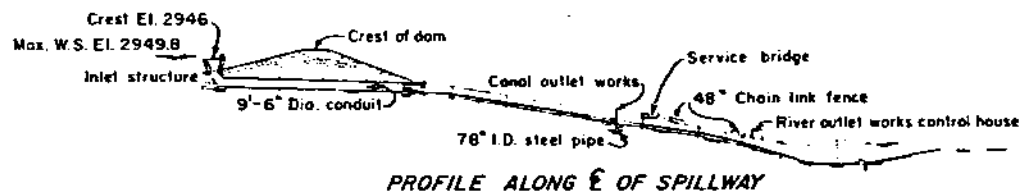
SECTION A-A



RIVER OUTLET WORKS



SECTION ON ℄ OUTLET WORKS AND CANAL OUTLET WORKS



PROFILE ALONG ℄ OF SPILLWAY

Merritt Dam, Plan and Sections

APPENDIX "B"

NEBRASKA MUNICIPAL POWER POOL

1335 L Street
Lincoln, Nebraska 68508
Telephone: (402) 474-4759

January 5, 1981

Mr. Leonard Pewthers
Nebraska State Energy Office
P. O. Box 95085
Lincoln, NE 68509

Subject: Low-Head Hydro Status Report

Dear Leonard:

Pursuant to your request last week, this letter is written to inform the State Energy Office of the present status of activity in the area of low-head hydro by members of the Nebraska Municipal Power Pool.

Presently, the following cities are making applications to the Department of Energy's regional office in Kansas City for loans to be used in feasibility studies for low-head hydro facilities located at or near those cities: Beatrice, Burwell, Fairbury and Valentine. Other members of the Municipal Power Pool have indicated a desire to pursue similar feasibility studies; however, up to this point in time, no other cities have initiated any activity of this nature.

We will keep you posted on the progress of these studies as they are being conducted.

Yours truly,

Stan Feuerberg
Coordinating Engineer

SF:plo

cc: Richard Duxbury

APPENDIX "C"

NEBRASKA MUNICIPAL POWER POOL

1335 L Street
Lincoln, Nebraska 68508
Telephone: (402) 474-4759

January 23, 1981

Mr. William Palmer
Director
Nebraska Energy Office
P. O. Box 95085
Lincoln, Nebraska 68509

Dear Mr. Palmer:

The Nebraska Municipal Power Pool is pleased to transmit herewith a proposal for an investigation of a subject of importance to the entire state citizenry, the development of hydroelectric energy along Nebraska's streams. We are convinced, and hope you will agree, that our state has a history of careful utilization of resources while attempting to meet the energy, water, and environmental needs of our citizens. We are also convinced that the state's citizens have the right to expect that this pattern will continue, and that we will develop the most economic energy possible.

The study as proposed herein should be immediately authorized because the state water planning process is currently evaluating beneficial uses of flows in our streams, hydropower is experiencing a comeback, the federal government has recently expressed expanded interests in helping states develop their hydroelectric power potential, and any such development within the state should be accomplished according to a state plan rather than on a site-by-site basis.

The objective of this proposal is to develop a criterion by which decisions can be made regarding the feasibility of hydroelectric energy development at any particular river point in the state. The study will also identify the power that can be produced and the impacts that the development will have on the surrounding region.

A recent national survey of hydroelectric power potential by the U. S. Army Corps of Engineers revealed that one-third of the nation's power was once

H. Steve Wacker, General Manager

generated by low cost, non-polluting hydroelectric power plants. Presently, this figure has dropped to less than 15%, and continues to decline as more and more fossil fuel and nuclear plants are developed. Other facts that you may not be familiar with are:

- Nebraska has more than 80 sites at which hydroelectric power facilities exist or could be installed.

- Nebraska's potential if developed would serve 100,000 households, would be equivalent to a savings of 405,000 tons of coal (at $14,200,000) per year, would be equivalent to a savings of 1,600,000 barrels of oil (at $87,800,000) per year and would add 240 megawatts of installed capacity to Nebraska's power scene.

- Experts feel that because of technical, environmental, and political constraints, only about 50% of the theoretical maximum potential could be developed. This means that half the above figures could realistically be achieved.

- Worldwide, the hydroelectric generation is about 23% of the total generation, yet the U. S. value is only 14.9%.

- Many small up-graded hydro plants are producing energy for as little as 20 to 35 mills per kWh.

- Federal legislation has provided both incentives and financing for hydropower development.

- The Federal Energy Regulatory Commission is relaxing its criteria for licensing, especially in the case of hydro-electric development.

Private interests from outside Nebraska have contacted municipalities offering financing assistance to obtain preliminary permits from the Federal Energy Regulatory Commission to construct low-head hydro facilities. The power generated would be under the control of the private interests. This result may not necessarily be in the best interests of the people of the State of Nebraska.

Hydropower is a renewable energy source, the construction and hook-up time is short; water is used in a beneficial and nonconsumptive fashion; the power is available for local control and use; environmental disruption and impacts are minimal; and hydropower development is relatively free from the effects of inflation because the plants are capital-intensive and the fuel is free.

You may recall the early days of hydroelectric power usage in Nebraska, and the fact that these sites were a center of recreational activity for all seasons. The pressing need for expanded water-based recreation in the state has led some to propose large scale projects, but the opposition to these may force the State to meet this need with many smaller scale developments. It is a proven fact that the milling and hydroelectric sites around the state can help meet this important need.

The State of Nebraska, through the creative urging of the Legislature, has initiated an accelerated State Water Planning and Review process. This process has as one of its objectives of highest priority the investigation of a state policy on in-stream flow uses. Hydropower is included as part of this study, but the funding and time dedicated are inadequate for a thorough analysis through the funded planning process.

Of all the in-stream uses that are being assessed in the planning process, hydroelectric power offers the greatest compromise to the schism that exists between the out-of-stream user and the in-stream preservationist. Along with other uses of our streams, low-head hydroelectric power generation offers a suitable and beneficial use meeting the needs of our expanding economy and our growing numbers of recreationists.

Nebraska is a net energy importer. We either import our energy or we import the fuels which produce the energy which we consume. Even though low-head hydropower development will never bring us to self-sufficiency, it will provide supplemental power and political and technical leverage which should give us a better base for competing in the future for energy resources. One of our greatest natural resources is our streamflow, and the development of some or most of our hydroelectric power potential allows us to use our own natural resources more effectively and to rely less on the resources of other states.

The enclosed proposal has the necessary and sufficient components to complete a statewide survey and analysis of the potential for hydroelectric power. The investigations would be completed to a level of detail which would allow direct determination of feasibility on a site-by-site and stream-by-stream basis. Detail would also be available to meet all requirements of the Federal Energy Regulatory Commission and the Department of Energy for licensing and financing hydropower units. This statewide approach would avoid the inefficiency of investigating sites on an uncoordinated, individual basis by a host of interests with mixed or competitive concerns for the state's streamflows.

Please note that construction of such facilities is to be financed through the issuance of tax-exempt revenue bonds. The proposed municipal joint financing legislation would allow such an issuance on a collective basis,

resulting in the lowest possible financing costs. This legislation has been discussed with you on previous occasions. The funds requested here are solely for study purposes.

In preparing this proposal, we relied heavily on advice and guidance given by water, environmental, and energy resource consultants within the state. The cost estimates, time schedule, and work tasks were suggested by those specialists and are indicative of the requirements of a project with this scope and scale. Should this project be authorized, it is our recommendation that the consultants utilized in the preliminary proposal also perform the services described. We are comfortable with their capabilities and experience in this field, and we are prepared to show that they are uniquely equipped to perform the requirements.

We would like to discuss further our thinking about the benefits of such a study, and would welcome the opportunity to meet with you to answer questions and explain our conviction that Nebraska needs this study and its conclusions.

Sincerely,

H. Steve Wacker
General Manager

HSW:njg
Attach:

APPENDIX "D"

DRAFT INVENTORY OF EXISTING HYDROELECTRIC DAMSITES

IN NEBRASKA

March, 1981

Information reported as available:

1. Site Identification (Agency), Project Name
2. Stream
3. Owner
4. County/Nearest Downstream Town
5. Location
6. Purpose/Status
7. New Power Head (ft)
8. Inflow (cubic feet per second)
9. Average Annual Flow (acre feet/year)
10. Existing Capacity (kw)/Average Annual Energy (mwh)
11. Incremental Capacity/Energy
12. Condition Power House and Facilities
13. Present use of Dam
14. Type and Condition of Dam
15. Access Road Condition
16. Environmental and Institutional Barriers
17. Energy Demand in Area

Inventory of existing Hydroelectric Damsites in Nebraska

Site Identification (Agency) Project Name	Stream	Owner	County/ Nearest Downstream Town	Location[1]	Purpose/ Status	Net Power Head (ft)	Inflow[2] (cubic feet per second)	Avg. Annual Flow (acre feet/year)	Existing[2] Capacity (kw)/ Average (mwh) Annual Energy	Incremental Capacity Energy	Condition Power House & Facilities	Present use of Dam	Type & Condition of Dam	Access Road Condition
Valentine #1	Minnechaduza	City of Valentine	Cherry		Inactive		40.0	24,560	---					
Valentine #2	Minnechaduza	NPPD	Cherry		Hydroelectric Operational		35.0		(220) 250 (388)					
Valentine #3	Niobrara	NPPD	Cherry		Inactive[3]		2,150.0	562,700	(250) 1,850					
Spencer	Niobrara	NPPD	Holt Spencer		Hydroelectric Operational		1,450.0	1,012,000	(1,800) 3,900 (11,580)					
NE1MR00 237 (USCE) Maloney North Platte	North & South Platte R.	NPPD	Lincoln North Platte	41° 3.3" 100° 46.9"	Hydroelectric Operational	213 Gross	2,550.0		(24,000 KW / 111,125 KWH)		Very Good	Storage, Rec., FEW	Very Good	Very Good
NE1MR00 238 (USCE) Gothenburg	Platte R.	NPPD	Lincoln Gothenburg	40° 59.2" 100° 20.5"	Inactive	45 Gross	188.0		400 / 0		Fair/Poor	Rec., FEW	Good	Good
NE1MR00 202 (USCE) Kearney Diversion	Platte R.	NPPD	Buffalo Kearney	40° 41.2" 99° 20.9"	Irrigation & Hydroelectric Operational	54 Gross	625.0		1,500KW / 900,000KWH		Good	Storage, Rec.	Good	Good
NEHMR00 235 (USCE) Jeffrey Reservoir	North & South Platte R.	CNPP & ID	Lincoln Brady	40° 57.6" 100° 23.9"	Irrigation & Hydroelectric Pes./Div. Operational	115.0	2,220.0	1,071,000	18,000 101,000		Very Good			
NE1MR00 225 (USCE) Johnson #1	North & South Platte R.	CNPP & ID	Gosper Elwood	40° 41.6" 99° 49.0"	Irrigation, Hydro. & Flood Operational	113.0	2,200.0	748,000	(19,000) 18,000 68,000					
Johnson #2	North & South Platte R.	CNPP & ID	Gosper Lexington	40° 41.1" 99° 44.7"	Irrig, Hydro & Flood/Operational	145.0	2,200.0	743,000	(19,000) 18,000 87,000					
Ericson	Cedar River	Lake Ericson Dev. Corp	Wheeler		Inactive		175.0		440		Removed			
Spalding	Cedar River	City of Spalding	Greeley		Inactive		290.0	111,600	150					
Boelus	Middle Loup R.	NPPD	Howard	30-13-12	Inactive		1,000.0		2,500		Removed		Removed	
NE1MR00 801 (USCE) Monroe	Loup R.	LPPD	Platte Columbus	41° 30.0" 97° 35.9"	Hydroelectric Pes./Div. Operational		3,500.0		8,250[4]	0				
NEHMR00 243 (USCE) Columbus - Lake Babcock	(canal) Loup R.	LPPD	Platte Columbus	41° 28.0" 97° 22.0"	Hydroelectric Pes./Div. Operational		3,500.0		39,900[4] 19,540					
Norfolk	North Fork Elkhorn R.	Norfolk Feed Mills	Madison	23-24-1	Inactive		100.0	297,000	80					
NEGMRK0 116 (USCE) Imperial	Frenchman Creek	City of Imperial	Chase	40° 26.0" 101° 37.9"	Hydroelectric Pes./Div. Retired P.P.		(68) 55.0	47,600	140					
Champion Mills	Frenchman Creek	Carl Hill	Chase	21-6-39	Retired		28.3		---					
NEMMRK0 121 (USCE) Holmesville	Big Blue R.	Robert L Cunning	Gage Holmesville	40° 12.0" 96° 37.9"	Hydroelectric Pes./Div. Retired P.P.	12.1	(325.0) 500.0		(280) 350 900	4,377 6,542	House abandoned, no equipment	Recreational & Boat Club	Concrete Gravity - Good	New Bridge upstream

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3. Has been in operation at 250 KW accredited capability. Now is inactive awaiting determination of feasibility to repair dam.

4. Combined accredited capability of Columbus/Monroe is 40,000 KW
Average annual energy for Columbus/Monroe combine is 120,000 MWH

Inventory of existing Hydroelectric Damsites in Nebraska

Site Identification (Agency) Project Name	Stream	Owner	County/ Nearest Downstream Town	Location[1]	Purpose/ Status	Net Power Head (ft)	Inflow[2] (cubic feet per second)	Avg. Annual Flow (acre feet/year)	Existing[2] Capacity (kw)/ Average (mwh) Annual Energy	Incremental Capacity Energy	Condition Power House & Facilities	Present use of Dam	Type & Condition of Dam	Access Road Condition
NEGMRKO 120 (USCE) Blue Springs	Big Blue R.	NPPD	Gage Barneston	40° 8.0" 96° 39.0"	Hydroelectric Res./Div. Retired P.P		(725) 450.0		420 1,200	18 722	House - fair Equipment - operable but poor	Recreational	Concrete faced wood - Poor	Private Drive
NEGMRKO 133 (USCE) DeWitt	Big Blue R.	Zwonechek Estate	Saline Beatrice	40° 23.0" 96° 56.0"	Hydroelectric Res./Div. Retired P.P.	10	(368) 200.0	398,000 (375)	240 800	178 1,159	Powerhouse - Good Equipment repairable	National Register of Historical Places	Concrete faced wood piles - Breached	Private Drive
NEYMRKO 133 (USCE) Barneston	Big Blue R.	Norris PPD	Gage Barneston	40° 3.1" 96° 35.2"	Hydroelectric Recreational Res./Div. Retired P.P.		(762) 500.0	569,500 (750)	720 1,200	158 2,076	House - Good Equipment - Poor	Recreational	Concrete Gravity - Good	Private Drive
NECMROO 209 (USCE) Merritt Reservoir	Snake River	DOI USBR	Cherry Valentine	42° 38.0" 100° 52.3"	Irrigation Recreation Non-existent	110.0	244.0	108,700	0 0	2,040 12,381				
NEIMROO 208 (USCE) Pierce Mill	Minnecha-duza R.	NPPD	Cherry Valentine	42° 53.0" 100° 33.1"	Hydroelectric Non-existent		33.8	24,560	0 0	0 0				
NE6MROO 205 (USCE) Reservoir	Niobrara R.		Cherry	42° 51.9" 100° 14.5"	Hydro & Irrigation	75.0	656.8		0 0	8,980 34,755				
NE6MROO 206 (USCE) Sparks	Niobrara R.		Cherry	42° 54.4" 100° 22.9"	Hydro & Irrigation	60.0	838.0	563,700	0 0	7,829 30,558				
NE6MROO 207 (USCE) Thacher	Niobrara R.		Cherry	42° 51.5" 100° 30.0"	Hydro & Irrigation	106.0	588.2		0 0	8,594 33,155				
NE6MROO 226 (USCE) Phoenix 2	Niobrara R.		Holt	42° 54.0" 98° 58.9"	Hydro & Irrigation	100.0	1,177.1		0 0	15,516 62,419				
NE6MROO 227 (USCE) Otter Creek	Niobrara R.		Holt	42° 49.5" 99° 12.5"	Hydro & Irrigation	145.0	923.1		0 0	18,314 73,530				
NE6MROO 252 (USCE) Redbird	Niobrara R.		Boyd	42° 46.5" 98° 22.5"	Hydro & Irrigation	100.0	1,392.1		0 0	17,061 74,109				
NECMROO 240 (USCE) Norden	Niobrara R.	Water Power Resource Service	Brown Butte	42° 28.2" 100° 0.0"	Irrigation Recreation	175.0	934.6	625,200	0 0	21,992 70,116				
NEGMROO 228 (USCE) Northern N.	Niobrara R.	NPPD	Holt Niobrara	42° 48.5" 98° 39.4"	Hydroelectric	18.0	1,395.3		(1,800) 2,640 (11,580) 7,343	0 0	Duplication of Spencer - Page 1			
NECMROO 211 (USCE) Box Butte	Niobrara R.	DOI USBR	Dawes Dunlap	42° 27.4" 103° 3.9"	Irrigation	56.0	26.7	19,260	0 0	0 0				
NECMROO 675 (USCE) Antelope C.	Tri-Antelope	City of Gordon	Sheridan Gordon	42° 48.5" 102° 16.0"	Flood Control	25.0	8.9		0 0	0 0				
NECMROO 676 (USCE) Antelope C.	Antelope Creek	City of Gordon	Sheridan Gordon	42° 48.9" 102° 12.7"	Flood Control	27.0	4.0		0 0	0 0				
NECMROO 677 (USCE) Whitney Reservoir	White R.	Whitney Irrigation Dist.	Dawes Whitney	42° 46.7" 103° 18.6"	Irrigation	12.0	15.0	14,630	0 0	0 0				
NE6MROO 253 (USCE) Long Pine	Long Pine R.		Keya Paha	42° 43.4" 99° 37.9"	Hydro & Irrigation	150.0	142.6	99,260	0 0	1,285 9,054				
NE6MROO 201 (USCE) Saint Claire	Elkhorn R.	DOI USBR	Antelope	42° 2.3" 97° 56.2"	Hydro & Irrigation	105.0	877.0	167,000	0 0	13,252 39,097				

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Inventory of existing Hydroelectric Damsites in Nebraska

Site Identification (Agency) Project Name	Stream	Owner	County/ Nearest Downstream Town	Location[1]	Purpose/ Status	Net Power Head (ft)	Inflow[2] (cubic feet per second)	Avg. Annual Flow (acre feet/year)	Existing[2] Capacity (kw)/ Average (mwh) Annual Energy	Incremental Capacity Energy	Condition Power House & Facilities	Present use of Dam	Type & Condition of Dam	Access Road Condition
NE6MR00 250 (USCE) Pender Dam	Logan Creek	DOI USBR	Thurston	42° 7.8' 96° 43.6'	Hydro & Irrigation	52.0	123.9	91,290	0 0	100 797				
NE6MR00 210 (USCE) Monterrey	Pebble Creek		Cuming	41° 46.7' 96° 49.3'		90.0	20.0	25,940	0 0	0 0				
NECMR00 247 (USCE) Calamus	Calamus R.	Water Power Resource Service	Garfield Burwell	41° 49.9' 99° 12.4'	Irrigation Recreation	80.0	300.0	217,400	0 0	1,652 11,114				
NECMR00 223 (USCE) Burwell - Sumter	North Loup R.	North Loup	Garfield Burwell	41° 47.5' 99° 7.8'	Irrigation	0	705.7		0 0	0 0				
NECMR00 239 (USCE) Taylor - Ord	North Loup R.	North Loup	Loup Taylor	41° 47.7' 99° 27.6'	Irrigation	0	446.9	331,800	0 0	0 0				
NECMR00 241 (USCE) Fullerton	Cedar R.	City of Fullerton	Nance Fullerton	41° 22.5' 97° 57.9'	Hydroelectric	0	239.7	173,900	0 0	0 0				
NECMR00 218 (USCE) Papillion	Papillion		Douglas Omaha	41° 18.9' 96° 7.2'	Flood Control Recreation	58.0	30.5		0 0	0 0				
NECMR00 219 (USCE) Irvington	Papillion		Douglas Omaha	41° 20.3' 96° 3.2'	Flood Control Recreation	46.0	7.3		0 0	0 0				
NECMR00 671 (USCE) Lonergan R.	Tri-Knight	Lonergan	Douglas Omaha	41° 22.3' 96° 2.3'	Recreation	75.0	1.0		0 0	0 0				
NEGMR00 220 (USCE) Site 3A	Papillion		Douglas	41° 22.8' 96° 9.9'	---	67.0	29.4		0 0	0 0				
NEGMR00 221 (USCE) Papio Site	Papillion		Douglas	41° 16.7' 96° 9.9'	---	59.0	4.2		0 0	0 0				
NEGMR00 222 (USCE) Papio Site	Papillion		Douglas	41° 13.2' 96° 9.0'		75.0	4.5		0	0				
NECMR00 204 (USCE) Beaver Lake	Rock Creek	Beaver Lake	Cass Rock Bluff	40° 55.4' 95° 52.1'	Recreation Water Supply	90.0	4.4		0	0				
NEGMRK0 128 (USCE) Palmyra Res.	Hooper Creek		Otoe	40° 42.8' 96° 19.3'	---	0	24.0		0 0	0 0				
NEGMRK0 127 (USCE) Auburn Reservoir	Muddy Creek		Nemaha	40° 19.9' 95° 56.0'	---	0	24.0		0 0	0 0				
NEGMRK0 129 (USCE) Humboldt Reservoir	Long Branch		Richardson	40° 10.8' 95° 58.3'	---	0	20.0		0 0	0 0				
NEGMRK0 130 (USCE) Stella Reservoir	Little Muddy		Richardson	40° 12.4' 95° 47.6'	---	0	18.0		0 0	0 0				
NEGMRK0 126 (USCE) Tecumseh Reservoir	Yankee Creek		Johnson	40° 21.9' 96° 18.1'	---	0	25.0		0 0	0 0				
NECMRK0 122 (USCE) Big Indian	Tri-Big Indian	Lower Big	Gage Wymore	40° 5.5' 96° 43.0'	Flood Control	0	71.0		0 0	0 0				
NECMR00 230 (USCE) Wagon Train	Hickman Branch		Lancaster Hickman	40° 37.1' 96° 35.0'	Flood Control Recreation	42.0	9.6		0 0	0 0				
NECMR00 231 (USCE) Pawnee Dam	North Branch		Lancaster Emerald	40° 50.3' 96° 51.8'	Flood Control Recreation	60.0	11.4		0 0	0 0				

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Inventory of existing Hydroelectric Damsites in Nebraska

Site Identification (Agency) Project Name	Stream	Owner	County/ Nearest Downstream Town	Location[1]	Purpose/ Status	Net Power Head (ft)	Inflow[2] (cubic feet per second)	Avg. Annual Flow (acre feet/year)	Existing[2] Capacity (kw)/ Average (mwh) Annual Energy	Incremental Capacity Energy	Condition Power House & Facilities	Present use of Dam	Type & Condition of Dam	Access Road Condition
NECMR00 232 (USCE) Stagecoach	Hickman Branch		Lancaster Hickman	40° 36.3′ 96° 38.2′	Flood Control Recreation	39.0	5.2		0 0	0 0				
NECMR00 233 (USCE) Branched Oak	Salt Creek		Lancaster Raymond	40° 58.2′ 96° 51.2′	Flood Control Recreation	77.0	19.3		0 0	0 0				
NECMR00 234 (USCE) Bluestem Lake	Olive Branch		Lancaster Sprague	40° 37.6′ 96° 47.3′	Flood Control Recreation	49.0	6.2		0 0	0 0				
NECMR00 701 (USCE) Conestoga	Holmes Creek		Lancaster Lincoln	40° 45.9′ 96° 50.6′	Flood Control Recreation	30.0	6.2		0 0	0 0				
NECMR00 702 (USCE) Yankee Hill	Cardwell Branch		Lancaster Lincoln	40° 43.8′ 96° 46.9′	Flood Control Recreation	40.0	5.5		0 0	0 0				
NECMR00 703 (USCE) Holmes Lake	Antelope Creek		Lancaster Lincoln	40° 46.9′ 96° 38.2′	Flood Control Recreation	52.0	2.9		0 0	0 0				
NECMR00 704 (USCE) Olive Creek	Olive Creek		Lancaster Sprague	40° 35.1′ 96° 50.8′	Flood Control Recreation	25.0	8.1		0 0	0 0				
NEGMRK0 131 (USCE) Wilber	Big Blue R.		Saline Wilber	40° 33.9′ 96° 56.9′	Hydroelectric	0	360.0		200 600	29 1,247				
NEYMRK0 498 (USCE) City of Crete	Big Blue R.	City of Crete	Saline Wilber	40° 36.6′ 96° 56.9′	Inactive	11.5	342.0	253,600	0 0	1 0				
NE6MRK0 132 (USCE) Shestak Dam	Turkey Creek		Saline DeWitt	40° 33.9′ 97° 3.5′	Reservoir with power - Breached	0	78.0	46,400	0 0	5,176 1,522				
NECMR00 248 (USCE) Twin Lakes	South Branch		Seward Lincoln	40° 49.5′ 96° 57.3′	Flood Control Recreation	45.0	4.6		0 0	0 0				
NEYMRK0 497 (USCE) Shady Trail	Big Blue R.	Ne. Game & Parks Comm.	Seward Crete	40° 43.9′ 97° 1.4′		14.39	122.0		0 0	1 0				
NEYMRK0 499 (USCE) Plant Site	West Fork	ABC Elec. Co., Inc.	Seward Crete	40° 42.1′ 97° 6.4′		13.5	167.0	123,900	0 0	85 719				
NE6MRK0 134 (USCE) Seward Vie.	Lincoln Creek		Seward Seward	40° 54.8′ 97° 8.7′		0	44.0	32,100	0 0	2,768 729				
NE6MRK0 135 (USCE) Beaver Crossing	West Fork		Seward Beaver Crossing	40° 46.7′ 97° 18.2′		0	170.0		0 0	8,483 4,029				
NE6MRK0 115 (USCE) Surprise D.	Big Blue R.		Butler	41° 6.3′ 97° 20.2′		0	27.0	17,400	0 0	0 0				
NE6MR00 203 (USCE) Skull Creek	Skull Creek		Butler	41° 22.1′ 96° 57.2′		95.0	11.6		0 0	0 0				
NEIMR00 242 (USCE) Loup Diversion	Loup	Loup River Power	Nance Genoa	41° 23.6′ 97° 49.3′	Hydroelectric	0	773.2	1,205,000	0 0	0 0				
NECMR00 251 (USCE) Hardenbrook	North Loup	North Loup	Valley Scotia	41° 35.7′ 98° 54.4′	Irrigation	0	589.5	627,400	0 0	0 0				
NECMR00 249 (USCE) Sherman Res.	Oak Creek	DOI-USBR	Sherman Ashton	41° 18.1′ 98° 52.0′	Irrigation Recreation	85.0	1.7		0 0	0 0				

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NECMR00 674 (USCE) Kearney Res.	Kearney Canal	Nebr Public Power Dist.	Buffalo Kearney	40° 42.2' 99° 5.9'	Hydroelectric Recreation	0	0		0 0	0 0				
NEIMR00 706 (USCE) Midstate P.	Wood River		Buffalo	41° 0.0' 98° 36.3'		138.0	0		0 0	0 0				
NECMR00 673 (USCE) Spring Creek	Tri-Spring	Dawson Co.	Dawson Lexington	41° 0.7' 99° 58.3'	Flood Control ---	31.0	1.5		0 0	0 0				
NECMR00 679 (USCE)	East Midway	Central Ne. P.P.I.D.	Dawson Cozad	40° 46.5' 100° 1.1'	Hydroelectric Irrigation	0	0		0 0	0 0				
NECMR00 683 (USCE) Earth Dam	Plum Creek	Central Ne. P.P.I.D.	Dawson Lexington	40° 42.0' 99° 55.1'	Hydroelectric Irrigation	66.0	0.6		0 0	0 0				
NECMR00 684 (USCE) Earth Dam	Gallagher	Central Ne. P.P.I.D.	Dawson Lexington	40° 44.4' 99° 58.9'	Hydroelectric Irrigation	41.0	2.9		0 0	0 0				
NECMR00 685 (USCE)	East Midway	Central Ne. P.P.I.D.	Dawson Cozad	40° 47.1' 100° 2.7'	Hydroelectric Irrigation	0	0		0 0	0 0				
NECMR00 686 (USCE) Earth Dam	Central Midway	Central Ne. P.P.I.D.	Dawson Cozad	40° 47.9' 100° 3.5'	Hydroelectric Irrigation	52.0	0.6		0 0	0 0				
NECMR00 687 (USCE)	Central Midway	Central Ne. P.P.I.D.	Dawson Cozad	40° 47.7' 100° 5.0'	Hydroelectric Irrigation	0	0		0 0	0 0				
NECMR00 688 (USCE)	Brown Canyon	Central Ne. P.P.I.D.	Dawson Cozad	40° 48.9' 100° 5.5'	Hydroelectric Irrigation	0	0		0 0	0 0				
NECMR00 689 (USCE)	Tri-Platte	Central Ne. P.P.I.D.	Dawson Cozad	40° 50.3' 100° 8.3'	Hydroelectric Irrigation	0	0		0 0	0 0				
NECMR00 212 (USCE) Earth Dam	Hiles (Litt)	Central Ne. P.P.I.D.	Dawson Gothenburg	41° 51.1' 100° 10.1'	Hydroelectric Irrigation	0	380.7		0 0	0 0				
NECMR00 213 (USCE) Earth Dam	Plum Creek	Central Ne. P.P.I.D.	Dawson Lexington	40° 42.2' 99° 55.3'	Hydroelectric Irrigation	17.0	250.0		0 0	0 0				
NECMR00 214 (USCE) Dawson County	Platte R.	Nebr Public Power	Dawson Lexington	40° 50.5' 99° 59.6'	Irrigation	0	540.5	(1979) 277,900	0 0	0 0				
NECMRK0 124 (USCE) Harlan County	Republican		Harlan Naponee	40° 3.9' 99° 12.6'	Flood Control Irrigation	0	436.0	200,700	0 0	1,439 3,341				
NECMR00 680 (USCE) Earth Dam	Platte off.	Central Ne. P.P.I.D.	Gosper Lexington	40° 41.6' 99° 46.9'	Hydroelectric Irrigation	46.0	2.9		0 0	0 0				
NECMR00 681 (USCE)	Platte off.	Central Ne. P.P.I.D.	Gosper Lexington	40° 41.8' 99° 47.3'	Hydroelectric Irrigation	0	0		0 0	0 0				
NECMR00 682 (USCE)	Platte off.	Central Ne. P.P.I.D.	Gosper Lexington	40° 41.8' 99° 48.4'	Hydroelectric Irrigation	0	0		0 0	0 0				
NEIMR00 224 Earth Dam	Platte off.	Central Ne. P.P.I.D.	Gosper Lexington	40° 40.8' 99° 44.6'	Hydroelectric Irrigation	0	0		0 0	0 0				
NECMRK0 118 (USCE) Harry Strunk Lake	Medicine Creek	DOI- USBR	Frontier Cambridge	40° 22.6' 100° 13.0'	Irrigation Flood Control Recreation	0	68.0	45,640	0 0	0 0				

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Inventory of existing Hydroelectric Damsites in Nebraska

Site Identification (Agency) Project Name	Stream	Owner	County/ Nearest Downstream Town	Location[1]	Purpose/ Status	Net Power Head (ft)	Inflow[2] (cubic feet per second)	Avg. Annual Flow (acre feet/year)	Existing[2] Capacity (kw)/ Average (mwh) Annual Energy	Incremental Capacity Energy	Condition Power House & Facilities	Present use of Dam	Type & Condition of Dam	Access Road Condition
NECMRKO 119 (USCE) Hugh Butler Lake	Red Willow	DOI USBR	Frontier Indianola	40° 21.5′ 100° 39.8′	Irrigation Flood Control Recreation	0	29.0	17,790	0 0	0 0				
NECMRKO 125 (USCE) Swanson Lake	Republican	DOI USBR	Hitchcock Trenton	40° 10.2′ 101° 3.5′	Irrigation Flood Control Recreation	0	138.0	64,410	0 0	786 1,729				
NECMRKO 117 (USCE) Enders Reservoir	Frenchman	DOI USBR	Chase Wauneta	40° 25.0′ 101° 30.8′	Irrigation Flood Control Recreation	0	68.0	46,730	0 0	0 0				
NEIMROO 802 (USCE) North Platte	Platte Canal	C.N.P.P.I.D.	Lincoln North Platte	41° 5.9′ 100° 48.0′	Irrigation Operational	0	0	45,570		0 0				
NECMROO 690 (USCE)	Tri-Platte	Central Ne. P.P.I.D.	Lincoln Brady	40° 58.2′ 100° 26.9′	Hydroelectric Irrigation	0	0		0 0	0 0				
NECMROO 691 (USCE)	Snell Canyon	Central Ne. P.P.I.D.	Lincoln Brady	40° 58.2′ 100° 28.0′	Hydroelectric Irrigation	0	0		0 0	0 0				
NECMROO 692 (USCE)	Target Can.	Central Ne. P.P.I.D.	Lincoln Brady	40° 58.8′ 100° 28.4′	Hydroelectric Irrigation	0	0		0 0	0 0				
NECMROO 693 (USCE)	Target Can.	Central Ne. P.P.I.D.	Lincoln Brady	40° 29.8′ 100° 29.2′	Hydroelectric Irrigation	0	0		0 0	0 0				
NECMROO 694 (USCE)	Target Can.	Central Ne. P.P.I.D.	Lincoln Brady	40° 59.9′ 100° 29.2′	Hydroelectric Irrigation	0	0		0 0	0 0				
NECMROO 695 (USCE)	Target Can.	Central Ne. P.P.I.D.	Lincoln Brady	41° 0.1′ 100° 29.7′	Hydroelectric Irrigation	0	0		0 0	0 0				
NECMROO 696 (USCE)	Target Can.	Central Ne. P.P.I.D.	Lincoln Brady	41° 0.5′ 100° 30.3′	Hydroelectric Irrigation	0	0		0 0	0 0				
NECMROO 697 (USCE)	Cottonwood	Central Ne. P.P.I.D.	Lincoln Brady	41° 0.7′ 100° 31.1′	Hydroelectric Irrigation	0	0		0 0	0 0				
NECMROO 698 (USCE)	Box Elder Creek	Central Ne. P.P.I.D.	Lincoln Maxwell	41° 1.7′ 100° 33.9′	Hydroelectric Irrigation	0	0		0 0	0 0				
NECMROO 699 (USCE)	Moran Canyon	Central Ne. P.P.I.D.	Lincoln Maxwell	41° 3.5′ 100° 37.1′	Hydroelectric Irrigation	0	0		0 0	0 0				
NECMROO 700 (USCE)	Platte	Central Ne. P.P.I.D.	Lincoln Maxwell	41° 6.7′ 100° 40.3′	Hydroelectric Irrigation	0	0		0 0	0 0				
NECMROO 236 (USCE) Sutherland	South Platte	Nebr. P.P.D.	Lincoln Sutherland	41° 7.6′ 101° 8.2′	Hydroelectric Irrigation	51.0	41.9		0 0	0 0				
NE6MROO 705 (USCE) Structure	Brule Water		Keith	41° 8.0′ 101° 54.0′	Hydroelectric Irrigation	0	5.8		0 0	0 0				
NEIMROO 215 (USCE) Lake McConaughy	North Platte	Central Ne. P.P.I.D.	Keith Keystone	41° 14.2′ 101° 39.9′	Hydroelectric Irrigation Flood Control	13.6	1,496.6		50,000 100,000	0 0				
NECMROO 216 (USCE) Platte Valley	South Platte	Nebr. P.P.D.	Keith Paxton	41° 7.1′ 101° 28.4′	Hydroelectric Irrigation	0	390.8		0 0	0 0				
NECMROO 217 (USCE) Keystone P.	North Platte	Nebr. P.P.D.	Keith Keystone	41° 12.8′ 101° 38.1′	Hydroeletric Irrigation	0	530.7		0 0	0 0				

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Inventory of existing Hydroelectric Damsites in Nebraska

Site Identification (Agency) Project Name	Stream	Owner	County/ Nearest Downstream Town	Location[1]	Purpose/ Status	Net Power Head (ft)	Inflow[2] (cubic feet per second)	Avg. Annual Flow (acre feet/year)	Existing[2] Capacity (kw)/ Average (mwh) Annual Energy	Incremental Capacity Energy	Condition Power House & Facilities	Present use of Dam	Type & Condition of Dam	Access Road Condition
NECMROO 672 (USCE) Brule Creek	Brule Canyon	Twin Platte	Keith Brule	41° 6.7' 101° 54.7'	Flood Control	46.0	6.5		0 0	0 0				
NECMROO 678 (USCE) Crescent Lake	Tri-Blue Creek	Lake Water	Garden Lewellen	41° 41.8' 102° 23.9'	Irrigation	2.0	0.0		0 0	0 0				
NECMROO 245 (USCE) Lake Alice	North Platte	D.O.I. U.S.B.R.	Scottsbluff Scottsbluff	41° 59.2' 103° 37.8'	Irrigation Recreation	24.0	94.2		0 0	0 0				
NECMROO 246 (USCE) Lake Minatare	North Platte	D.O.I. U.S.B.R.	Scottsbluff Bridgeport	41° 55.0' 103° 30.0'	Irrigation Recreation	43.0	98.0		0 0	0 0				
NECMROO 244 (USCE) Lake Alice	North Platte	D.O.I. U.S.B.R.	Scottsbluff Bridgeport	41° 58.8' 103° 35.6'	Irrigation Recreation	8.0	94.8		0 0	0 0				
NECMROO 229 (USCE) Oliver Reservoir	Lodgepole	Kimball Irrig.	Kimball Kimball	41° 13.2' 103° 48.5'	Irrigation	38.0	11.0	8,040	0 0	0 0				
(USCE) Chalco	West Papillion	USCE	Sarpy	23-14-11	Flood Control Recreation									
Fairbury Dam	Little Blue	City of Fairbury	Jefferson	15-2-2	Power		16.7		300					
School Creek Dam #3	School Creek		Clay	40° 38.4' 97° 52.5'	Flood Control Recreation Irrigation									
Donavon Project	Cottonwood Creek	D. E. Donavon	Franklin	25-2-16	Power	20	2.0		17.0					
Dunlap Dam	Niobrara		Dawes	25-29-48										
Bennett Res.	Lodge Pole		Kimball Dix	22-15-55										
Champion Creambry	Frenchman		Chase Champion	21-6-39	Power	34.4			37.5		Removed		Breached	
Callaway Mill	South Loup		Custer Callaway	21-15-23	Power	83.0					Removed		Breached	
Lamb Plant	Elk Creek		Rock	6-31-19	Power	3.0			3.13		Removed			

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Environmental and Institutional Barriers for the Big Blue River Damsites

1. Some initial displacement of wildlife during construction.
2. Some decrease in available land use due to increased storage.
3. There will be barriers to fish migration where dams have been breached.
4. There will be an increased sediment load during construction resulting in muddied discharge downstream.

Energy Demand in Area of the Big Blue River Damsites

The Nebraska Municipal Power Pool considers Beatrice to be the logical user of electricity from this source. Beatrice has no generating capacity of its own. Peak usage and projected peak usage are:

1977 27.4 Megawatts

1983 38 Megawatts

1995 68 Megawatts

ABBREVIATIONS

Abbreviations that appear in the Inventory of existing Hydroelectric Damsites in Nebraska.

USCE = United States Corps of Engineers

NPPD = Nebraska Public Power District

LPPD = Loup Public Power District

CNPP&ID = Central Nebraska Public Power and Irrigation District

Norris PPD = Norris Public Power District

Res/Div = Reservoir and Diversion

DOI USBR = Department of Interior, United States Bureau of Reclamation

kw = kilowatt

mw = megawatt

mwh = megawatt hour