U.S. Hydropower Resource Assessment
for
North Dakota

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MASTER *EP*

ABSTRACT

The Department of Energy is developing an estimate of the hydropower development potential in this country. The Hydropower Evaluation Software (HES) is a computer model that was developed by the Idaho National Engineering Laboratory for this purpose. The HES measures the potential hydropower resources available in the United States, using uniform criteria for measurement. The software was developed and tested using hydropower information and data provided by the Southwestern Power Administration. It is a dBASE menu-driven software application that allows the personal computer user to assign environmental attributes to potential hydropower sites, calculate development suitability factors for each site based on the environmental attributes present, and generate reports based on these suitability factors. This report details the resource assessment results for the state of North Dakota.

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U.S. Hydropower Resource Assessment for North Dakota

INTRODUCTION

In June 1989, the U.S. Department of Energy initiated the development of a National Energy Strategy to identify the energy resources available to support the expanding demand for energy in the United States. Public hearings conducted as part of the strategy development process indicated that potential hydropower resources were not well defined. As a result, the Department of Energy established an interagency Hydropower Resource Assessment Team to ascertain the hydropower potential. In connection with these efforts by the Department of Energy, the Idaho National Engineering Laboratory designed the Hydropower Evaluation Software (HES), which has been used to perform a resource assessment of the undeveloped hydropower potential in North Dakota (as well as several other states). This report presents the results of the hydropower resource assessment for the state of North Dakota. Pumped storage hydropower potential is not included.

The HES was developed as a tool to measure hydropower potential by regional power marketing administrations and state energy agencies, because they were the most likely to have and need accurate hydropower information. The HES was not intended to provide precise development factors for individual sites, but to provide regional or state capacity totals. Because the software was developed as a generic measurement tool encompassing national issues, regional and state totals must be considered judiciously; various local issues may skew hydropower potential totals. The information for the resource assessment was compiled from the Federal Energy Regulatory Commission's Hydropower Resource Assessment database and several other sources. Refer to DOE/ID-10338, the User's Manual (Francfort, Matthews, Rinehart, 1991) for the specifics of the software and to DOE/ID-10430,

the Status Report (Francfort, Moore, Rinehart, 1993) for an overview of all resource assessment activities to date.

Model Development

Hydropower Evaluation Software, both a probability-factor computer model and a data base, is a dBASE, menu-driven software application that is intended to be user-friendly. Computer screens and report generation capabilities were developed to meet the needs of users nationwide. The software uses environmental attribute data to generate an overall project environmental suitability factor (PESF) between 0.1 and 0.9, where 0.9 indicates the highest likelihood of development and 0.1 indicates the lowest likelihood of development. Suitability factors depend on environmental attributes of a potential site. They reflect the considerations that (a) environmental concerns can make a potential site unacceptable, prohibiting its development (for a suitability factor of 0.1), or (b) absence of environmental concern can have little or no effect on the likelihood of site development (for a suitability factor of 0.9). A combination of attributes results in a lower suitability factor because multiple environmental considerations reduce the likelihood that a site may be developed to its physical potential.

Model Goal

The goal of the HES is to assemble an accurate resource database of all potential hydropower sites in the United States for use as a planning tool to determine the viable national hydropower potential. Potential hydropower is not limited to the development of new sites; it also includes the development of additional hydropower at sites that currently have hydropower but are not developed to their full potential. This hydropower potential is a source of nonpolluting, renewable energy available to meet the growing power needs of the United States. The HES should make

this goal attainable and help assure a set of uniform criteria for national assessment.

Dam Status

The effects of environmental attributes vary by dam status. The dam status classifications follow the Federal Energy Regulatory Commission (FERC) standard, which is

- W = Developed hydropower site with power. The total hydropower capacity has not been fully developed. Only the undeveloped capacity is discussed in this report.
- W/O = Developed site without power generation. The site has some type of developed impoundment or diversion structure but no hydropower generating capacity.
- U = Undeveloped site. The site does not have power generation capability nor a developed impoundment or diversion structure.

ASSESSMENT RESULTS

Summary Results

A total of 14 sites have been identified and assessed for their hydropower potential. Information as to the potential megawatts of capacity for 2 of the sites was not available; however, these sites have been identified as having hydropower potential and are included in the group of 14. The Hydropower Evaluation Software results for site capacities range from 1 kilowatt to 43 megawatts. Most of the sites have potential capacities of under 1 megawatt (Figure 1).

The unadjusted hydropower potential for North Dakota was identified as being 100 megawatts. The Hydropower Evaluation Software results lower this estimate 50% to 50 megawatts. The greatest reduction in undeveloped potential occurs at sites with some hydropower already installed. These sites have a Hydropower Evaluation Software estimated capacity of 43 megawatts, a 50% reduction in capacity (Figure 2). The number of sites does not change, only the identified capacity is reassessed (Figure 3).

Figure 1. Number of sites with various capacity potentials. The unknown category is for sites that have hydropower potential but the size of the potential is undefined.

Figure 2. The Hydropower Evaluation Software identified potential hydropower capacity and the unadjusted potential capacity.

Figure 3. The number of sites with potential hydropower capacity and the total megawatts of potential capacity.

The 14 identified sites are located within 10 river basins. The number of sites per river basin ranges from 1 site in several river basins to 3 sites in the Red River of the North River Basin (Figure 4). The Missouri River Basin has the most undeveloped potential hydropower capacity of the North Dakota river basins (Figure 5).

Detailed Results

The appendices contain, in the form of Hydropower Evaluation Software generated reports, detailed information of the potential hydropower capacity in North Dakota. The appendices contain the following information:

Appendix A The hydropower capacity summary for North Dakota categorizes sites by dam status. The number of sites, unadjusted capacity, and Hydropower Evaluation Software adjusted capacity are provided based on the dam status.

Appendix B The hydropower resource assessment by river basin includes the FERC project number, project name, stream name, dam status,

unadjusted capacity, and Hydropower Evaluation Software adjusted capacity for each of the individual sites. Subtotals are provided for each river basin.

Appendix C This is a listing of the project numbers, plant name, stream name, if a site is Federally owned, unadjusted capacity, and Hydropower Evaluation Software adjusted capacity. The sites are grouped by dam status.

Appendix D This section contains a resource database listing for each of the 14 sites in North Dakota. Information includes plant, stream, state, county, river basin and owner names; project number; name plate and Hydropower Evaluation Software adjusted capacity ratings; the unit and plant types, dam status; latitude; longitude; and the environmental factors that the Hydropower Evaluation Software uses to determine the project environmental suitability factor.

Figure 4. Number of sites with potential hydropower capacity in the North Dakota river basins.

Figure 5. Potential hydropower capacity in the North Dakota river basins.

OBTAINING INDIVIDUAL STATE INFORMATION

Additional copies of the hydropower resource assessment results for individual states are available and can be obtained by writing or calling the National Technical Information Service (NTIS).

Telephone Orders – (703) 487-4650. NTIS sales desk and customer services are available between 8:30 a.m. and 5:00 p.m., Eastern Standard Time.

Fax – (703) 321-8547. Customers may fax their orders to NTIS. These orders may be charged to a NTIS deposit account, American Express, VISA, or MasterCard.

Mail Orders – Mail orders should be sent to National Technical Information Service, Document Sales, 5285 Port Royal Road, Springfield, VA 22161. Call the sales desk for prices before placing an order.

Method of Payment – Customers may pay for reports (and other NTIS products and services) by (a) credit card (American Express, Visa, or MasterCard); (b) check or money order on a United States bank payable to NTIS; (c) a NTIS deposit account; or (d) by asking to be billed (add \$7.50 per order, United States, Canada, and Mexico, only).

Handling Fee – A \$3.00 handling fee per total order applies to orders from the United States, Canada, and Mexico. Handling charges do not apply to rush order service or pick-up orders.

Postage and Shipping – Orders are shipped first class mail, or equivalent, to addresses in the United States, Canada, and Mexico.

Order Turnaround Time – Orders for technical reports generally are shipped within 2 to 8 days of receipt. For faster service, NTIS offers rush order service.

Rush Order Service – Call 1-800-533-NTIS. In Virginia, Canada, and Mexico call (703) 487-4700. For NTIS rush order service add

\$15.00 per item. This guarantees that an order will be processed through NTIS within 24 hours of its receipt. These orders receive immediate, individual attention. The items ordered are delivered by first call mail. Call NTIS for information on rush order service for computer products.

For Help in Tracing an Order – Call (703) 487-4650 and request the customer service option.

ADDITIONAL HYDROPOWER EVALUATION SOFTWARE INFORMATION

Additional information concerning the Hydropower Evaluation Software can be obtained by contacting Ben Rinehart or Jim Francfort at the addresses provided below. Copies of the software and the User's Manual may also be obtained from these individuals.

Ben Rinehart
Idaho National Engineering Laboratory
P.O. Box 1625
Idaho Falls, ID 83415-3830
(208) 526-1002

Jim Francfort
Idaho National Engineering Laboratory
P.O. Box 1625
Idaho Falls, ID 83415-3875
(208) 526-6787

Information concerning the state of North Dakota involvement with the resource assessment or about the identified sites may be obtained by contacting:

Kim Christianson
Office of Intergovernmental Assistance
14th Floor - State Capital
600 East Boulevard Avenue
Bismarck, North Dakota 58105-3526
(701) 224-2094

REFERENCES

Francfort, J. E., S. D. Matthews, and B. N. Rinehart, 1991, *Hydropower Evaluation Software User's Manual*, DOE/ID-10338, Idaho National Engineering Laboratory, Idaho Falls, Idaho.

Francfort, J. E., K. M. Moore, and B. N. Rinehart, 1993, *Uniform Criteria for U.S. Hydropower Resource Assessment, Hydropower Evaluation Software Status Report*, DOE/ID-10430, Idaho National Engineering Laboratory, Idaho Falls, Idaho.

Appendix A
Hydropower Capacity Summary

DATE: 10/05/93

H Y D R O P O W E R C A P A C I T Y S U M M A R Y

<u>State</u>	<u>Category</u>	<u>Number of Projects</u>	<u>Name Plate Capacity (KW)</u>	<u>HES Adjusted Capacity (KW)</u>
ND	With Power	2	86108.50	43054.25
	W/O Power	10	13431.55	6718.34
	Undeveloped	2	39	35.10
	STATE TOTAL	14	99579.05	49807.69
TOTALS	With Power	2	86108.50	43054.25
	W/O Power	10	13431.55	6718.34
	Undeveloped	2	39	35.10
GRAND TOTAL		14	99579.05	49807.69

Appendix B
Hydropower Resource Assessment by River Basin

HYDROPOWER RESOURCE ASSESSMENT BY RIVER BASIN

FERC Number	Plant Name/ Stream	Dam Stat	Name Plate Rating (KW)	PESF	PESF * KW
** River Basin MISSOURI - GRAND RIVER					
ND013	BOWMAN-HALEY DAM NORTH FORK GRAND RIVER	WO	1.50	0.50	0.75
** Subtotal **			1.50		0.75
** River Basin MISSOURI - HEART					
ND010	DICKINSON DAM HEART RIVER	WO	2.85	0.50	1.43
ND011	LAKE TSCHIDA (HEART BUTTE) HEART RIVER	WO	31.00	0.50	15.50
** Subtotal **			33.85		16.93
** River Basin MISSOURI - JAMES RIVER					
ND008	JAMESTOWN DAM JAMES RIVER	WO	110.00	0.50	55.00
** Subtotal **			110.00		55.00
** River Basin MISSOURI MAIN STREAM					
ND004	BISMARCK (MANDAN) MISSOURI R	U	0.00	0.10	0.00
** Subtotal **			0.00		0.00
** River Basin MISSOURI RIVER - MCCLUSKY					
ND006	LINCOLN VALLEY CHUTE MCCLUSKY CANAL	WO	10448.00	0.50	5224.00
ND007	LONETREE RESERVOIR MCCLUSKY CNL (MISSOURI R)	WO	2665.00	0.50	1332.50
** Subtotal **			13113.00		6556.50
** River Basin MISSOURI RIVER BASIN					
ND005	GARRISON DAM - RIVERDALE MISSOURI R	W	86000.00	0.50	43000.00
** Subtotal **			86000.00		43000.00

HYDROPOWER RESOURCE ASSESSMENT BY RIVER BASIN

FERC Number	Plant Name/ Stream	Dam Stat	Name Plate Rating (KW)	PESF	PESF * KW
** River Basin MISSOURI-JAMES-PIPESTEM					
ND009	PIPESTEM LAKE DAM PIPESTEM CREEK	WO	42.20	0.50	21.10
** Subtotal **			42.20		21.10
** River Basin RED - PEMBINA RIVERS					
ND014	PEMBILIER DAM PEMBINA RIVER	W	108.50	0.50	54.25
** Subtotal **			108.50		54.25
** River Basin RED RIVER OF THE NORTH					
ND002	KINDRED DAM SHEYENNE RIVER	U	39.00	0.90	35.10
ND001	DRAYTON DAM RED RIVER OF THE NORTH	WO	0.00	0.50	0.00
ND012	GRAND FORKS RIVERSIDE DAM RED RIVER	WO	124.60	0.50	62.30
** Subtotal **			163.60		97.40
** River Basin RED-SHEYENNE					
ND003	BALDHILL DAM SHEYENNE R	WO	6.40	0.90	5.76
** Subtotal **			6.40		5.76
*** Total ***			99579.05		49807.69

Appendix C
North Dakota (ND) Sites

HYDROPOWER RESOURCE ASSESSMENT BY STATE

FERC Number	Plant Name/ Stream	Fed. Proj	Name Plate Rating (KW)	PESF	KW * PESF
** State Name ND					
** Dam Status: W					
ND005	GARRISON DAM - RIVERDALE MISSOURI R	Yes	86000.00	0.50	43000.00
ND014	PEMBILIER DAM PEMBINA RIVER		108.50	0.50	54.25
* Subsubtotal *			86108.50		43054.25
** Subtotal **			86108.50		43054.25
*** Total ***			86108.50		43054.25

HYDROPOWER RESOURCE ASSESSMENT BY STATE

FERC Number	Plant Name/ Stream	Fed. Proj	Name Plate Rating (KW)	PESF	KW * PESF
** State Name ND					
** Dam Status: WO					
ND003	BALDHILL DAM SHEYENNE R	Yes	6.40	0.90	5.76
ND006	LINCOLN VALLEY CHUTE MCCLUSKY CANAL	Yes	10448.00	0.50	5224.00
ND007	LONETREE RESERVOIR MCCLUSKY CNL (MISSOURI R)	Yes	2665.00	0.50	1332.50
ND008	JAMESTOWN DAM JAMES RIVER	Yes	110.00	0.50	55.00
ND009	PIPESTEM LAKE DAM PIPESTEM CREEK	Yes	42.20	0.50	21.10
ND010	DICKINSON DAM HEART RIVER	Yes	2.85	0.50	1.43
ND011	LAKE TSCHIDA (HEART BUTTE) HEART RIVER	Yes	31.00	0.50	15.50
ND013	BOWMAN-HALEY DAM NORTH FORK GRAND RIVER	Yes	1.50	0.50	0.75
ND001	DRAYTON DAM RED RIVER OF THE NORTH		0.00	0.50	0.00
ND012	GRAND FORKS RIVERSIDE DAM RED RIVER		124.60	0.50	62.30
* Subsubtotal *			13431.55		6718.34
** Subtotal **			13431.55		6718.34
*** Total ***			13431.55		6718.34

HYDROPOWER RESOURCE ASSESSMENT BY STATE

FERC Number	Plant Name/ Stream	Fed. Proj	Name Plate Rating (KW)	PESF	KW * PESF
** State Name ND					
** Dam Status: U					
ND004	BISMARCK (MANDAN) MISSOURI R		0.00	0.10	0.00
ND002	KINDRED DAM SHEYENNE RIVER		39.00	0.90	35.10
* Subsubtotal *			39.00		35.10
** Subtotal **			39.00		35.10
*** Total ***			39.00		35.10

DATE: 10/05/93

H Y D R O P O W E R C A P A C I T Y S U M M A R Y

<u>State</u>	<u>Category</u>	<u>Number of Projects</u>	<u>Name Plate Capacity (KW)</u>	<u>HES Adjusted Capacity (KW)</u>
ND	With Power	2	86108.50	43054.25
	W/O Power	10	13431.55	6718.34
	Undeveloped	2	39	35.10
	STATE TOTAL	14	99579.05	49807.69
TOTALS	With Power	2	86108.50	43054.25
	W/O Power	10	13431.55	6718.34
	Undeveloped	2	39	35.10
GRAND TOTAL		14	99579.05	49807.69

Appendix D
Resource Database Listing

RESOURCE DATABASE LISTING

DATE: 10/05/93

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FERC Number	Plant Name	Stream	State Name
ND001	DRAYTON DAM	RED RIVER OF THE NORTH	ND

County Name	River Basin
PEMBINA	RED RIVER OF THE NORTH

Class	Owner Name
M	DRAYTON, CITY OF

Name Plate Rating (KW)	PESF	PESF*KW	Annual Energy Rating (MWh)	PESF Annual Energy Rating (MWh)
0.00	0.50	0.00	0.00	0

Unit Type	Plant Type	Project Status	Dam Status	Latitude Longitude	4835.43 9709.06
Z	ROR	XX	WO		

Factor	Exist	Prob	Factor	Exist	Prob
Wild/Scenic Protection	Y	0.50	Wildlife Value	Y	0.75
Wild/Scenic Tributary or Upstream/Downstream			Threatened/Endangered Fish		0.90
Wild/Scenic Location		0.90	Threatened/Endangered Wildlife		0.90
Cultural Value		0.90	Federal Land Code 103		0.90
Fish Presence Value	Y	0.75	Federal Land Code 104		0.90
Geologic Value		0.90	Federal Land Code 105		0.90
Historic Value		0.90	Federal Land Code 106		0.90
Other Value		0.90	Federal Land Code 107		0.90
Recreation Value	Y	0.75	Federal Land Code 108		0.90
Scenic Value	Y	0.90	Federal Land Code 198		0.90

RESOURCE DATABASE LISTING

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FERC Number	Plant Name	Stream	State Name		
ND002	KINDRED DAM	SHEYENNE RIVER	ND		
County Name	River Basin				
RANSOM	RED RIVER OF THE NORTH				
Class	Owner Name				
M	RANSOM COUNTY WRD				
Name Plate Rating (KW)	PESF	PESF*KW	Annual Energy Rating (MWh)	PESF Annual Energy Rating (MWh)	
39.00	0.90	35.10	170.90	153.81	
Unit Type	Plant Type	Project Status	Dam Status	Latitude Longitude	4632.00 9818.00
Z	RES	ZZ	U		
Factor	Exist	Prob	Factor	Exist	Prob
Wild/Scenic Protection		0.90	Wildlife Value		0.90
Wild/Scenic Tributary or Upstream/Downstream			Threatened/Endangered Fish		0.90
Wild/Scenic Location		0.90	Threatened/Endangered Wildlife		0.90
Cultural Value		0.90	Federal Land Code 103		0.90
Fish Presence Value		0.90	Federal Land Code 104		0.90
Geologic Value		0.90	Federal Land Code 105		0.90
Historic Value		0.90	Federal Land Code 106		0.90
Other Value		0.90	Federal Land Code 107		0.90
Recreation Value		0.90	Federal Land Code 108		0.90
Scenic Value		0.90	Federal Land Code 198		0.90

RESOURCE DATABASE LISTING

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FERC Number	Plant Name	Stream	State Name
ND003	BALDHILL DAM	SHEYENNE R	ND

County Name	River Basin
BARNES	RED-SHEYENNE

Class	Owner Name
F	CORPS OF ENGINEERS

Name Plate Rating (KW)	PESF	PESF*KW	Annual Energy Rating (MWh)	PESF Annual Energy Rating (MWh)
6.40	0.90	5.76	34.60	31.14

Unit Type	Plant Type	Project Status	Dam Status	Latitude Longitude	4702.12 9804.48
Z	RES	XX	WO		

Factor	Exist	Prob	Factor	Exist	Prob
Wild/Scenic Protection		0.90	Wildlife Value		0.90
Wild/Scenic Tributary or Upstream/Downstream			Threatened/Endangered Fish		0.90
Wild/Scenic Location		0.90	Threatened/Endangered Wildlife		0.90
Cultural Value		0.90	Federal Land Code 103		0.90
Fish Presence Value		0.90	Federal Land Code 104		0.90
Geologic Value		0.90	Federal Land Code 105		0.90
Historic Value		0.90	Federal Land Code 106		0.90
Other Value		0.90	Federal Land Code 107		0.90
Recreation Value		0.90	Federal Land Code 108		0.90
Scenic Value		0.90	Federal Land Code 198		0.90

RESOURCE DATABASE LISTING

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FERC Number	Plant Name	Stream	State Name
ND004	BISMARCK (MANDAN)	MISSOURI R	ND

County Name	River Basin
BURLEIGH	MISSOURI MAIN STREAM

Class	Owner Name
-------	------------

0

Name Plate Rating (KW)	PESF	PESF*KW	Annual Energy Rating (MWh)	PESF Annual Energy Rating (MWh)
0.00	0.10	0.00	0.00	0

Unit Type	Plant Type	Project Status	Dam Status	Latitude Longitude	0.00 0.00
Z	ROR	ZZ	U		

Factor	Exist	Prob	Factor	Exist	Prob
--------	-------	------	--------	-------	------

Wild/Scenic Protection		0.90	Wildlife Value	Y	0.25
Wild/Scenic Tributary or			Threatened/Endangered Fish		0.90
Upstream/Downstream			Threatened/Endangered Wildlife		0.90
Wild/Scenic Location		0.90	Federal Land Code 103		0.90
Cultural Value	Y	0.50	Federal Land Code 104		0.90
Fish Presence Value	Y	0.25	Federal Land Code 105		0.90
Geologic Value		0.90	Federal Land Code 106		0.90
Historic Value	Y	0.50	Federal Land Code 107		0.90
Other Value		0.90	Federal Land Code 108		0.90
Recreation Value	Y	0.25	Federal Land Code 198		0.90
Scenic Value	Y	0.50			

R E S O U R C E D A T A B A S E L I S T I N G

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FERC Number	Plant Name	Stream	State Name
ND005	GARRISON DAM - RIVERDALE	MISSOURI R	ND

County Name	River Basin
MCLEAN-MERCER	MISSOURI RIVER BASIN

Class	Owner Name
F	CORPS OF ENGINEERS

Name Plate Rating (KW)	PESF	PESF*KW	Annual Energy Rating (MWh)	PESF Annual Energy Rating (MWh)
86000.00	0.50	43000.00	773000.00	386500

Unit Type	Plant Type	Project Status	Dam Status	Latitude	Longitude
C	STG	FA	W	4730.06	10125.54

Factor	Exist	Prob	Factor	Exist	Prob
Wild/Scenic Protection		0.90	Wildlife Value	Y	0.75
Wild/Scenic Tributary or			Threatened/Endangered Fish		0.90
Upstream/Downstream			Threatened/Endangered Wildlife		0.90
Wild/Scenic Location		0.90	Federal Land Code 103		0.90
Cultural Value	Y	0.75	Federal Land Code 104		0.90
Fish Presence Value	Y	0.75	Federal Land Code 105		0.90
Geologic Value		0.90	Federal Land Code 106		0.90
Historic Value	Y	0.75	Federal Land Code 107		0.90
Other Value		0.90	Federal Land Code 108		0.90
Recreation Value	Y	0.75	Federal Land Code 198		0.90
Scenic Value	Y	0.90			

RESOURCE DATABASE LISTING

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FERC Number	Plant Name	Stream	State Name
ND006	LINCOLN VALLEY CHUTE	MCCLUSKY CANAL	ND

County Name	River Basin
SHERIDAN	MISSOURI RIVER - MCCLUSKY

Class	Owner Name
F	BUREAU OF RECLAMATION

Name Plate Rating (KW)	PESF	PESF*KW	Annual Energy Rating (MWh)	PESF Annual Energy Rating (MWh)
10448.00	0.50	5224.00	59088.00	29544

Unit Type	Plant Type	Project Status	Dam Status	Latitude Longitude
Z	CMB	ZZ	WO	4742.00 10020.15

Factor	Exist	Prob	Factor	Exist	Prob
Wild/Scenic Protection		0.90	Wildlife Value	Y	0.75
Wild/Scenic Tributary or			Threatened/Endangered Fish		0.90
Upstream/Downstream			Threatened/Endangered Wildlife		0.90
Wild/Scenic Location		0.90	Federal Land Code 103		0.90
Cultural Value	Y	0.75	Federal Land Code 104		0.90
Fish Presence Value	Y	0.75	Federal Land Code 105		0.90
Geologic Value		0.90	Federal Land Code 106		0.90
Historic Value	Y	0.75	Federal Land Code 107		0.90
Other Value		0.90	Federal Land Code 108		0.90
Recreation Value	Y	0.75	Federal Land Code 198		0.90
Scenic Value	Y	0.90			

RESOURCE DATABASE LISTING

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FERC Number	Plant Name	Stream	State Name
ND007	LONETREE RESERVOIR	MCCLUSKY CNL (MISSOURI R)	ND

County Name	River Basin
SHERIDAN	MISSOURI RIVER - MCCLUSKY

Class	Owner Name
F	BUREAU OF RECLAMATION

Name Plate Rating (KW)	PESF	PESF*KW	Annual Energy Rating (MWh)	PESF Annual Energy Rating (MWh)
2665.00	0.50	1332.50	14385.00	7192.50

Unit Type	Plant Type	Project Status	Dam Status	Latitude Longitude	4741.30 9959.00
C	RES	XX	WO		

Factor	Exist	Prob	Factor	Exist	Prob
Wild/Scenic Protection		0.90	Wildlife Value	Y	0.75
Wild/Scenic Tributary or Upstream/Downstream			Threatened/Endangered Fish		0.90
Wild/Scenic Location		0.90	Threatened/Endangered Wildlife		0.90
Cultural Value	Y	0.75	Federal Land Code 103		0.90
Fish Presence Value	Y	0.75	Federal Land Code 104		0.90
Geologic Value		0.90	Federal Land Code 105		0.90
Historic Value	Y	0.75	Federal Land Code 106		0.90
Other Value		0.90	Federal Land Code 107		0.90
Recreation Value	Y	0.75	Federal Land Code 108		0.90
Scenic Value	Y	0.90	Federal Land Code 198		0.90

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FERC Number	Plant Name	Stream	State Name
ND008	JAMESTOWN DAM	JAMES RIVER	ND

County Name	River Basin
STUTSMAN	MISSOURI - JAMES RIVER

Class	Owner Name
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F	BUREAU OF RECLAMATION
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Name Plate Rating (KW)	PESF	PESF*KW	Annual Energy Rating (MWh)	PESF Annual Energy Rating (MWh)
110.00	0.50	55.00	484.10	242.05

Unit Type	Plant Type	Project Status	Dam Status	Latitude Longitude	4656.00 9842.36
C	RES	XX	WO		

Factor	Exist	Prob	Factor	Exist	Prob
Wild/Scenic Protection		0.90	Wildlife Value	Y	0.75
Wild/Scenic Tributary or Upstream/Downstream			Threatened/Endangered Fish		0.90
Wild/Scenic Location		0.90	Threatened/Endangered Wildlife		0.90
Cultural Value		0.90	Federal Land Code 103		0.90
Fish Presence Value	Y	0.75	Federal Land Code 104		0.90
Geologic Value		0.90	Federal Land Code 105		0.90
Historic Value		0.90	Federal Land Code 106		0.90
Other Value		0.90	Federal Land Code 107		0.90
Recreation Value		0.90	Federal Land Code 108		0.90
Scenic Value		0.90	Federal Land Code 198		0.90

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FERC Number	Plant Name	Stream	State Name
ND009	PIPESTEM LAKE DAM	PIPESTEM CREEK	ND

County Name	River Basin
STUTSMAN	MISSOURI-JAMES-PIPESTEM

Class	Owner Name
F	CORPS OF ENGINEERS

Name Plate Rating (KW)	PESF	PESF*KW	Annual Energy Rating (MWh)	PESF Annual Energy Rating (MWh)
42.20	0.50	21.10	184.10	92.05

Unit Type	Plant Type	Project Status	Dam Status	Latitude Longitude	4657.42 9845.00
C	RES	XX	WO		

Factor	Exist	Prob	Factor	Exist	Prob
Wild/Scenic Protection		0.90	Wildlife Value	Y	0.75
Wild/Scenic Tributary or Upstream/Downstream			Threatened/Endangered Fish		0.90
Wild/Scenic Location		0.90	Threatened/Endangered Wildlife		0.90
Cultural Value		0.90	Federal Land Code 103		0.90
Fish Presence Value	Y	0.75	Federal Land Code 104		0.90
Geologic Value		0.90	Federal Land Code 105		0.90
Historic Value		0.90	Federal Land Code 106		0.90
Other Value		0.90	Federal Land Code 107		0.90
Recreation Value		0.90	Federal Land Code 108		0.90
Scenic Value		0.90	Federal Land Code 198		0.90

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FERC Number	Plant Name	Stream	State Name
ND010	DICKINSON DAM	HEART RIVER	ND

County Name	River Basin
STARK	MISSOURI - HEART

Class	Owner Name
F	BUREAU OF RECLAMATION

Name Plate Rating (KW)	PESF	PESF*KW	Annual Energy Rating (MWh)	PESF Annual Energy Rating (MWh)
2.85	0.50	1.43	9.98	4.99

Unit Type	Plant Type	Project Status	Dam Status	Latitude	Longitude
C	RES	XX	WO	4652.12	10249.36

Factor	Exist	Prob	Factor	Exist	Prob
Wild/Scenic Protection		0.90	Wildlife Value	Y	0.75
Wild/Scenic Tributary or Upstream/Downstream			Threatened/Endangered Fish		0.90
Wild/Scenic Location		0.90	Threatened/Endangered Wildlife		0.90
Cultural Value		0.90	Federal Land Code 103		0.90
Fish Presence Value	Y	0.75	Federal Land Code 104		0.90
Geologic Value		0.90	Federal Land Code 105		0.90
Historic Value		0.90	Federal Land Code 106		0.90
Other Value		0.90	Federal Land Code 107		0.90
Recreation Value		0.90	Federal Land Code 108		0.90
Scenic Value		0.90	Federal Land Code 198		0.90

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FERC Number	Plant Name	Stream	State Name
ND011	LAKE TSCHIDA (HEART BUTTE)	HEART RIVER	ND

County Name	River Basin
GRANT	MISSOURI - HEART

Class	Owner Name
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F	BUREAU OF RECLAMATION
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Name Plate Rating (KW)	PESF	PESF*KW	Annual Energy Rating (MWh)	PESF Annual Energy Rating (MWh)
31.00	0.50	15.50	203.90	101.95

Unit Type	Plant Type	Project Status	Dam Status	Latitude	Longitude
C	RES	XX	WO	4635.48	10149.00

Factor	Exist	Prob	Factor	Exist	Prob
Wild/Scenic Protection		0.90	Wildlife Value	Y	0.75
Wild/Scenic Tributary or Upstream/Downstream			Threatened/Endangered Fish		0.90
Wild/Scenic Location		0.90	Threatened/Endangered Wildlife		0.90
Cultural Value		0.90	Federal Land Code 103		0.90
Fish Presence Value	Y	0.75	Federal Land Code 104		0.90
Geologic Value		0.90	Federal Land Code 105		0.90
Historic Value		0.90	Federal Land Code 106		0.90
Other Value		0.90	Federal Land Code 107		0.90
Recreation Value		0.90	Federal Land Code 108		0.90
Scenic Value		0.90	Federal Land Code 198		0.90

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FERC Number	Plant Name	Stream	State Name
ND012	GRAND FORKS RIVERSIDE DAM	RED RIVER	ND

County Name	River Basin
GRAND FORKS	RED RIVER OF THE NORTH

Class		Owner Name	
M		CITY OF GRAND FORKS	
Name Plate Rating (KW)	PESF	PESF*KW	Annual Energy Rating (MWh)
124.60	0.50	62.30	1489.20
			PESF Annual Energy Rating (MWh)
			744.60

Unit Type	Plant Type	Project Status	Dam Status	Latitude Longitude
C	RES	XX	WO	4756.30 9702.42

Factor	Exist	Prob	Factor	Exist	Prob
Wild/Scenic Protection		0.90	Wildlife Value	Y	0.75
Wild/Scenic Tributary or Upstream/Downstream			Threatened/Endangered Fish		0.90
Wild/Scenic Location		0.90	Threatened/Endangered Wildlife		0.90
Cultural Value		0.90	Federal Land Code 103		0.90
Fish Presence Value	Y	0.75	Federal Land Code 104		0.90
Geologic Value		0.90	Federal Land Code 105		0.90
Historic Value		0.90	Federal Land Code 106		0.90
Other Value		0.90	Federal Land Code 107		0.90
Recreation Value		0.90	Federal Land Code 108		0.90
Scenic Value		0.90	Federal Land Code 198		0.90

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FERC Number	Plant Name	Stream	State Name
ND013	BOWMAN-HALEY DAM	NORTH FORK GRAND RIVER	ND

County Name	River Basin
BOWMAN	MISSOURI - GRAND RIVER

Class	Owner Name
F	CORPS OF ENGINEERS

Name Plate Rating (KW)	PESF	PESF*KW	Annual Energy Rating (MWh)	PESF Annual Energy Rating (MWh)
1.50	0.50	0.75	6.90	3.45

Unit Type	Plant Type	Project Status	Dam Status	Latitude	Longitude
C	RES	XX	WO	4358.54	10314.48

Factor	Exist	Prob	Factor	Exist	Prob
Wild/Scenic Protection		0.90	Wildlife Value	Y	0.75
Wild/Scenic Tributary or Upstream/Downstream			Threatened/Endangered Fish		0.90
Wild/Scenic Location		0.90	Threatened/Endangered Wildlife		0.90
Cultural Value		0.90	Federal Land Code 103		0.90
Fish Presence Value	Y	0.75	Federal Land Code 104		0.90
Geologic Value		0.90	Federal Land Code 105		0.90
Historic Value		0.90	Federal Land Code 106		0.90
Other Value		0.90	Federal Land Code 107		0.90
Recreation Value		0.90	Federal Land Code 108		0.90
Scenic Value		0.90	Federal Land Code 198		0.90

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FERC Number	Plant Name	Stream	State Name
ND014	PEMBILIER DAM	PEMBINA RIVER	ND

County Name	River Basin
PEMBINA	RED - PEMBINA RIVERS

Class	Owner Name
M	PEMBINA COUNTY WRD

Name Plate Rating (KW)	PESF	PESF*KW	Annual Energy Rating (MWh)	PESF Annual Energy Rating (MWh)
108.50	0.50	54.25	477.20	238.60

Unit Type	Plant Type	Project Status	Dam Status	Latitude Longitude	4853.36 9759.00
C	RES	XX	W		

Factor	Exist	Prob	Factor	Exist	Prob
Wild/Scenic Protection	Y	0.50	Wildlife Value	Y	0.75
Wild/Scenic Tributary or Upstream/Downstream			Threatened/Endangered Fish		0.90
Wild/Scenic Location	Y	0.75	Threatened/Endangered Wildlife		0.90
Cultural Value	Y	0.75	Federal Land Code 103		0.90
Fish Presence Value	Y	0.75	Federal Land Code 104		0.90
Geologic Value	Y	0.90	Federal Land Code 105		0.90
Historic Value	Y	0.75	Federal Land Code 106		0.90
Other Value	Y	0.75	Federal Land Code 107		0.90
Recreation Value	Y	0.75	Federal Land Code 108		0.90
Scenic Value	Y	0.90	Federal Land Code 198		0.90

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