Certificate of Need Application for Mankato Energy Center

Mankato, Minnesota

Wenck

Prepared for

Mankato Energy Center, LLC

March 2, 2004

PUBLIC DOCUMENT – TRADE SECRET DATA HAS BEEN EXCISED

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February 26, 2004

Mr. Burl Haar
Executive Secretary
Minnesota Public Utilities Commission
Suite 350
121 Seventh Place East
St. Paul, MN 55101-2147

Re: Certificate of Need Application by Mankato Energy Center, LLC
Docket No. IP6345/CN-03-1884

Dear Mr. Haar,

Mankato Energy Center, LLC (Mankato Energy), a wholly owned subsidiary of Calpine Corporation submits the enclosed application to the Minnesota Public Utility Commission for a Certificate of Need for a 355 megawatt (based on winter conditions) natural gas-fired combined cycle power plant. The facility, to be known as the Mankato Energy Center, will be located in Lime Township, Blue Earth County, north of the City of Mankato.

Enclosed please find an original and six copies of the Trade Secret Version of the Certificate of Need Application for the Mankato Energy Center. An original and nine copies of the Public Version of the Application also are enclosed. It is our understanding that the Commission will forward copies internally as necessary, including copies to the Minnesota Attorney General's Office. Four copies of the Certificate of Need Application also have been sent to the Minnesota Department of Commerce. Mankato Energy also has enclosed a check in the amount of $6,937.50, which is 25 percent of the required processing fee for the Certificate of Need application.

As required by recent changes to the Minnesota Environmental Quality Board (EQB) rules, Mankato Energy is submitting the Site Permit Application separately. Mankato Energy will furnish any additional environmental information requested by the EQB in preparing the environmental assessment for the Project.

Sincerely,

MANKATO ENERGY CENTER, LLC

James J. Shield
Vice President, Business Development

cc: Jason Goodwin – Calpine Corporation
Kent Morton – Calpine Corporation

Jon Sandstedt – Wenck Associates

Enclosures

PUBLIC DOCUMENT – TRADE SECRET DATA HAS BEEN EXCISED

Certificate of Need Application for Mankato Energy Center

Mankato, Minnesota

Docket No. IP6345/CN-03-1884

Wenck File #1294-01

Prepared for:

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March 2, 2004

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Executive Summary – Needs Summary

ES - 1.1 BACKGROUND

The Minnesota Public Utilities Commission ("MPUC" or "Commission") approved the resource planning process proposed by Northern States Power Company ("NSP") d/b/a Xcel Energy, in Docket E-002/RP-00-787, *In the Mater of Northern States Power Company's Application for Approval of its 2000-2014 Resource Plan*, Order Approving Xcel Energy's 2000-2014 Resource Plan. A part of that approved process included a solicitation of proposals to increase its supply portfolio by 1,000 MW. To meet this objective, on December 6, 2001 Xcel Energy issued a Request for Supply Proposals with Power Deliveries Beginning 2005-2009 (the "RFP"). The RFP outlined the baseload and peaking supply needs of Xcel Energy for the period at issue, and encouraged potential bidders to propose any type of resource that they believed would enhance Xcel Energy's supply portfolio beginning in 2005 and extending into the year 2009.

Calpine Corporation ("Calpine")[1] responded to the RFP on March 14, 2002 with a bid of approximately 280 megawatts ("MW") baseload capacity (based on winter ambient conditions) and approximately 360 MW in initial peaking capacity (based on winter ambient conditions) with step increases in the peaking portion of the proposal of approximately 180 MW in the latter years of the timeframe set by Xcel Energy in the RFP.

On June 19, 2003, Calpine was notified that Xcel Energy had selected it for negotiation of a purchased power agreement ("PPA"). The negotiations, which are expected to be completed in the very near future, contemplate the sale by Calpine and purchase by NSP of up to 290 MW baseload capacity (based on winter ambient conditions) and 85 MW of peaking capacity (year round availability). The baseload capacity will be generated by a natural gas fired combined

[1] Calpine is the parent company of Mankato Energy Center, LLC, which is the project company organized to own the Mankato Energy Center. There are places in this Application where Calpine and Mankato Energy Center, LLC

cycle power plant. The peaking capacity will be generated by supplementally firing the duct burners associated with the same source. The portion of the power plant that will supply this electric energy is statutorily exempt from the Certificate of Need process pursuant to Minn. Stat. §§ 216B.243; 216B.2422, subd. 5(c). The MPUC agreed with this characterization in its order dated February 6, 2004, *In the Matter of the Application of Calpine Corporation for a Certificate of Need for a Large Electric Generating Facility*, Order Granting Exemptions from Filing Requirements and Limiting Scope (the "Exemption Order").

In order to achieve certain construction and operational efficiencies, conserve resources (land, water, labor, materials, etc.), and meet the expected energy growth needs in Minnesota in a timely manner, Calpine proposes to configure the power plant that will supply power to Xcel Energy larger than would be required solely to satisfy its obligations under the PPA. The power supply obligations under the PPA will be met with a power plant configured with one combustion turbine generator, one heat recovery steam generator, one steam turbine generator, one condenser, one multi-cell cooling tower, and certain other appurtenant pieces of machinery and equipment that are required for a safe and efficient operating power plant in the configuration described.[2] Calpine proposes to add one additional combustion turbine generator and one additional heat recovery steam generator to the facility. The same steam turbine generator, condenser, cooling tower, and appurtenant machinery and equipment used for the supply of Commission-approved power will be used to supply the additional power that is intended for sale to wholesale customers. It is the additional equipment and associated generating capacity (approximately 355 MW (winter) and 325 MW (summer) of capacity) that is the subject of this Certificate of Need Application ("Application").[3]

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are apparently used interchangeably. The intent is to be accurate in describing which entity may have been responsible for a certain action.

[2] The power plant configuration consisting of one combustion turbine generator ("CT"), one heat recovery steam generator {"HRSG"), one steam turbine generator ("ST"), and other appurtenant pieces of machinery and equipment described above is commonly referred to as a "1x1" configuration (meaning one CT/HRSG and one ST) or sometimes as a "1x1x1" configuration (meaning one CT, one HRSG, and one ST).

[3] The type of power plant proposed by Calpine is commonly referred to as a "2x1" configuration or sometimes as a "2x2x1" configuration.

ES - 1.2 FACILITY DESCRIPTION

Mankato Energy Center, LLC ("Mankato Energy"), a subsidiary of Calpine Corporation proposes to develop, construct, and operate a 2x1 natural gas-fired combined cycle power plant to be known as the Mankato Energy Center ("Facility" or "Project") at a location in Blue Earth County, just north of the current Mankato city limits in Lime Township. Pursuant to the terms of the Joint Resolution for Orderly Annexation between Lime Township and the City of Mankato that was executed on November 12, 1997, once the Facility has received the appropriate permits and approvals, the City of Mankato will annex the land comprising the Facility site.

The Facility as a whole will be capable of generating approximately 655 MW of electric power at summer ambient conditions (730 MW at winter ambient conditions). This generating capacity includes both baseload capacity (approximately 505 MW) and peaking capacity (approximately 150 MW) to be obtained from power augmentation equipment, i.e., duct firing and steam injection. The operation of the power plant in both baseload and peaking modes is described in more detail below.

The major equipment associated with the Facility as a whole includes the following:

- Two natural gas-fired combined cycle combustion turbine generators capable of using low sulfur distillate oil for a back-up fuel.
- Two heat recovery steam generators each equipped with natural gas-fired duct burners.
- One steam turbine generator/condenser.
- One multi-cell mechanical draft-cooling tower.

The portion of the Facility that is the subject of this Application includes one combustion turbine, one heat recovery steam generator, and two additional cells on the mechanical draft-cooling tower. In addition, both the lateral natural gas pipeline that will connect the Project to the nearby natural gas pipeline owned by Northern Natural Gas Company and the water supply

and discharge pipelines will be sized slightly larger than they would otherwise were the Facility built only to satisfy the requirements of the PPA.

ES - 1.3 PROJECT SATISFIES CERTIFICATE OF NEED CRITERIA

The Commission has established criteria to assess the need for a Large Electric Generating Facility in Minnesota Rules 7849.0120. The Project satisfies all four of the Commission's criteria for granting certification of the Project:

1) The Project will result in a more adequate, reliable, and efficient energy supply to Mankato Energy's customers and the people of Minnesota and neighboring states. (7849.0120A).

2) The Project is the best alternative, given its size, type, and timing; and considering its cost and its effect on the natural and socioeconomic environment (7849.0120 B).

3) The Project will benefit society by meeting overall state energy needs in an environmentally responsible manner (7849.0120C).

4) The Project is consistent with overall state energy needs and will comply with all applicable polices rules and regulations (7849.0120D).

ES - 1.4 MORE ADEQUATE RELIABLE, AND EFFICIENT ENERGY SUPPLY

The Mankato Energy Center will supply approximately 730 MW (winter conditions) of capacity to meet the electricity needs of Minnesota and the region.

- This additional capacity enhances the adequacy and reliability of the energy supply by serving to reduce part of the Mid-Continent Area Power Pool ("MAPP") region's capacity shortages predicted to appear in 2009.

- The Project enhances the adequacy and reliability of the energy supply by serving to increase reserve margins predicted to fall below the MAPP required level of 15 percent in 2006. This will help to minimize the cost of electricity and ensure a reliable energy supply.

The Project enhances the adequacy and reliability of the energy supply by serving to reduce the reliance on power that might otherwise be imported from outside the MAPP region. The Project will economically provide electricity at the same time increasing the self-sufficiency of the MAPP region. It will optimize the use of the stressed North American transmission system

ES - 1.5 BEST ALTERNATIVE

The portion of the Facility that is not subject to the statutory exemption from the Certificate of Need process pursuant to Minn. Stat. §§ 216B.243; 216B.2422, subd. 5(c) is the best alternative for meeting the energy needs of the local area in the near term. The Facility fits within the boundaries of the site selected by Calpine for the statutorily exempt portion of the Facility, it comports with the business model of Calpine, it is cost-effective when compared to the portion of the Facility that is the subject of this Application, and, finally, it uses commercially proven technology. All other alternatives reviewed by Mankato Energy, including the no-build alternative, the alternative of using other conventional fuel sources, and the alternative of using renewable resources or emerging technologies, fall short in one or more of these categories.

ES - 1.6 BENEFITS TO LOCAL AND REGIONAL COMMUNITY

The Facility will benefit the local and regional communities as well as the State of Minnesota:

- Construction of the Facility is estimated to cost approximately $150 million and will employ as many as 450 construction workers at peak construction periods;
- The State of Minnesota and Blue Earth County will receive sales and income tax revenue from the construction of the Project as well as income taxes from both the Project and the permanent full-time employees once the Facility is up and operating;
- The Facility will generate additional tax revenue for local taxing authorities including the City of Mankato, Blue Earth County, and the local school district;
- Mankato Energy intends to be an active member of the local community, participating in charitable events, community service organizations, and outreach programs:
- The Facility will be a clean, reliable, and economically feasible source of power thus promoting economic development to the local area and region.

ES - 1.7 REGULATORY REQUIREMENTS

The Minnesota Rules describe in detail the data an applicant seeking a Certificate of Need is required to submit to the MPUC. Minn. R. Ch.7849. The Rules allow an applicant, before submitting a Certificate of Need application, to seek an exemption from data that "is unnecessary to determine the need for the proposed facility or may be satisfied by submitting another document." Minn. R. 7849.0200, subp. 6. Such an exemption was granted by the MPUC on January 22, 2004. Accordingly, this Application will address only those requirements for which an exemption has not been allowed or in accordance with the data requirements specified in the Exemption Order.

ES - 1.8 REQUEST FOR CERTIFICATION

Calpine requests that the MPUC certify the need of approximately 325 MW (based on summer ambient conditions) to be generated by a portion of the Mankato Energy Center. The portion of the Facility that is subject to this request will be located alongside the portion of the Facility that is statutorily exempt from the Certificate of Need process.

Completeness of Rules Checklist

Minnesota Rule	Required Information	Applicability/ Location in the Document
7849. 0100	Purpose of Criteria – Criteria for assessment of need to be used by the commission as set forth in 7849.0120	Section 1.1
7849.0110	Consideration of Alternatives – with respect to each of the criteria listed in 7849.0120	Section 5.0
7849.0120	Criteria – Probable result of denial would be an adverse effect upon the future adequacy reliability, or efficiency of energy supply to applicant, customers, people of MN and neighboring states.	Section 6.0
A 1	Accuracy of the applicants forecast	Exemption Request, Section 1.1.2
A 2	Effects of the applicant's existing or expected conservation programs and state and federal conservation programs	Exemption Request Section 1.1.2
A 3	Effects of promotional practices on energy demand	Exemption Request, Section 1.1.2
A 4	Ability of current and planned facilities, not requiring certificates of need, to meet future demand	Exemption Request, Section 1.1.2
A 5	Effect of proposed facility in making efficient use of resources	Exemption Request, Section 1.1.2
7849.0120	Criteria – A more reasonable and prudent alternative has not been demonstrated	Section 5.0
B 1	Appropriate size, type and timing compared to reasonable alternatives	Section 5.0
B 2	Cost of the facility and its energy compared to reasonable alternatives	Section 5.3
B 3	Effects of the facility on natural and socioeconomic environments compared to the effects of reasonable alternative	Section 4.1
B4	Expected reliability compared to reasonable alternatives	Section 5.0
7849.0120	Criteria - Project will provide benefits to society	
C 1	Relationship of the proposed facility, or suitable modification to overall state energy needs to overall energy needs	Section 4.1
C 2	Effects of the facility on natural and socioeconomic environments compared to the effects of not building	Section 4.1
C 3	Effects of the facility or suitable modification in inducing future development	Section 4.2
C 4	Social beneficial uses of the output of the facility, or suitable modification including its uses to protect or enhance environmental quality	Section 2.7
D	Proposed facility or suitable modification will not fail to comply relevant policies, rules and regulations of other state, federal, local government agencies	Section 7.0

Minnesota Rule	Required Information	Applicability/ Location in the Document
7849.0200	Applications for Certificates of Need	See Below
Subpart 1	Form and Manner – Application must apply in form and manner prescribed in following subparts	See Application
Subpart 2	Copies, Title, Table of Contents - Submittal of original and 13 copies with a title page and complete table of contents	See Application
Subpart 3	Changes to Application - Changes or corrections to the application must comply with Subpart 2	Not Applicable at this Time
Subpart 4	Cover Letter - Application must be accompanied by a cover letter signed by the authorized officer	See Cover Letter
Subpart 5	Complete Applications - Commission must notify applicant within 30 days if application is not substantially complete	Not Applicable at this Time
Subpart 6	Exemptions – Request exemptions in writing, show that data requirements are unnecessary and commission responds to request and states exemptions granted.	See Appendix A
7849.0210	Filing Fees and Payment Schedule	Section 1.5
7849.0240	Need Summary and Additional Considerations	Executive Summary
Subpart 1	Need Summary – Summary of major factors justifying need for the facility	Executive Summary
Subpart 2 A	Additional Considerations – Socially beneficial uses of the output of the facility, including to protect or enhance environmental quality	Section 2.7
B	Additional Considerations – Promotional activities that may have given rise to the demand for the facility	Exemption Request, Section 1.1.2
C	Additional Considerations – Effects of facility in inducing future developments	Section 4.2
7849.0250	Description of Proposed LEGF and Alternatives	See Below
A 1	Description – Nominal generating capability and effects of economies of scale on the facility size and timing	Section 2.1 and Section 3.0
A 2	Description – Anticipated operating cycle and annual capacity factor	Section 2.8
A 3	Description – Type of fuel, reason for selection, projection of availability over life of the facility, and alternative fuels	Section 2.3
A 4	Description – Anticipated heat rate of the facility	Section 5.2.9
A 5	Description – Anticipated areas where facility will be located	Section 2.2 and 5.2.1
B 1	Discussion of Alternatives – Purchased power	Section 5.2.2
B 2	Discussion of Alternatives – Increased efficiency of existing facilities including transmission lines	Section 5.2.4
B 3	Discussion of Alternatives – New transmission lines	Section 5.2.5
B 4	Discussion of Alternatives – New generating facilities of a different size and energy source	Section 5.0
B 5	Discussion of Alternatives – Reasonable combinations of alternatives	Section 5.0
C	Proposed Facility and Viable Alternatives	Section 5.0
C 1	Discuss – Capacity cost in current dollars/kilowatt	Section 5.3
C 2	Discuss – Service life	Section 5.3
C 3	Discuss – Estimated average annual availability	Section 5.3
C 4	Discuss – Fuel costs in current dollars/ kilowatt hour	Section 5.3
C 5	Discuss – Viable operating and maintenance costs in current dollars/kilowatt hour	Section 5.3

Minnesota Rule	Required Information	Applicability/ Location in the Document
C 6	Discuss – Total cost in current dollars/kilowatt hour	Section 5.3
C 7	Estimate – Effect on rates system wide and in MN	Exemption Request, Section 1.1.2
C 8	Efficiency – Expressed for a generating facility as the estimated heat rate	Section 5.2.9, Section 5.3
C 9	Major Assumptions – For providing information relating to Items 1-8, including projected escalation rates for fuel costs, operating and maintenance costs as well as projected capacity factors	Section 5.3 and Appendix B
D	Map Showing Applicants System	Exemption Request, Section 1.1.2
E	Other Information – Relevant information about the proposed facility and alternatives necessary to determine need	Section 5.0
7849.0270	Peak Demand and Electrical Consumption Forecast	See Below
Subpart 1	Scope – application shall contain pertinent data concerning peak demand and annual electrical consumption within the applicant's service area and system	Exemption Request and Section 3.0
Subpart 2	Content of Forecast	Exemption Request and Section 3.0
Subpart 3	Forecast Methodology	Exemption Request and Section 3.0
Subpart 4	Data Base for Forecasts	Exemption Request and Section 3.0
Subpart 5	Assumptions and Special Information	Exemption Request and Section 3.0
Subpart 6	Coordination of Forecast with Other Systems	Exemption Request and Section 3.0
7849.0280	System Capacity	Exemption Request and Section 3.0
A	Describe – Power planning programs	Exemption Request and Section 3.0
B	Describe – Seasonal firm purchases and seasonal firm sales	Exemption Request and Section 3.0
C	Describe – Seasonal participation purchases and seasonal participation sales	Exemption Request and Section 3.0
D	Generation Capacity Data – For the summer and winter season corresponding to each forecast year provide the load and generation capacity data requested under Item D (1-13), including the anticipated purchases, sales, capacity requirements, and capacity additions, except those that depend on certificates of need not yet issued by the commission	Exemption Request and Section 3.0
E	Generation Capacity Data – For the summer and winter season corresponding to each forecast year subsequent to the year of application, provide the load and generation capacity data requested under Item D (1-13), purchases, sales, and generating capabilities contingent on the proposed facility	Exemption Request and Section 3.0
F	Generation Capacity Data – For the summer and winter season corresponding to each forecast year subsequent to the year of application, provide the load and generation capacity data requested under Item D (1-13), including all projected	Exemption Request and Section 3.0

Minnesota Rule	Required Information	Applicability/ Location in the Document
	purchases, sales and generating capability	
G	Generation Capacity Data – For each forecast year subsequent to the year of application, a list of proposed additions and retirements in net generating capacity, including the probable date of application for additions.	Exemption Request and Section 3.0
H	Generation Capacity Data – Monthly adjusted net demand and monthly adjusted net capability as well as the difference between the adjusted net capability and actual, planned or estimated maintenance outages, for the previous calendar year, current year, first full year before operation and the first full year of operation	Exemption Request and Section 3.0
I	Discuss – Appropriateness of and the method of determining system reserve margins, considering the probability of forced outages, deviations from load forecasts, scheduled maintenance outages, power exchange arrangements, and transfer capabilities	Exemption Request and Section 3.0
7849.0290	Conservation Programs	Exemption Request, Section 1.1.2
A	List – Name of committee, department or individual responsible for conservation programs	Exemption Request, Section 1.1.2
B	List – Applicant's energy conservation and efficiency goals and objectives	Exemption Request, Section 1.1.2
C	Describe – Specific energy conservations and efficiency programs, listing those that have been implemented and why others have not been implemented	Exemption Request, Section 1.1.2
D	Describe – Major accomplishments regarding energy conservation and efficiency	Exemption Request, Section 1.1.2
E	Future plans for energy conservation and efficiency through forecast years.	Exemption Request, Section 1.1.2
F	Describe – Future plans for energy conservation and efficiency through forecast years	Exemption Request, Section 1.1.2
7849.0300	Consequences of Delay – Discuss anticipated consequences if proposed facility is delayed	Exemption Request and Section 6.0
7849.0310	Environmental Information – Provide environmental data in response to part 7849.0250, Item C or 7849,0260, Item C and information as requested in part 7849.320 to 7849.0340	Section 2.7
7849.0320	Generating Facilities	See Site Permit Application
A	Provide Information – For each alternative LEGF, the estimated range of land requirements, including water storage, cooling systems and solid waste storage	See Site Permit Application
B	Provide Information – Vehicular, rail and barge traffic generated by construction and operation of the LEGF	See Site Permit Application
C	Fossil-Fueled Facilities	See Site Permit Application
C 1	Discuss – Expected regional sources of fuel	See Site Permit Application
C 2	Discuss - Typical fuel requirements during operation and expected annual fuel requirements	See Site Permit Application
C 3	Describe – Heat input in Btu/hr during operation at rated	See Site Permit

Minnesota Rule	Required Information	Applicability/ Location in the Document
	capacity	Application
C 4	Describe – Typical range of heat value and typical average heat value	See Site Permit Application
C 5	Describe – Typical ranges of sulfur, ash and moisture content of fuel	See Site Permit Application
D	Fossil – Fueled Facilities	See Site Permit Application
D 1	Provide Information – Estimated range of trace element emission and maximum emission of sulfur dioxide, nitrogen oxides and particulates in pounds per hour of operation at rated capacity	See Site Permit Application
D 2	Provide Information – Estimated range of maximum contributions to 24-hour average ground level concentrations at specified distance from the stack for sulfur dioxide, nitrogen oxides and particulates in micrograms per cubic meter at rated capacity and worst case meteorological conditions	See Site Permit Application
E	Water Use	See Site Permit Application
E 1	Describe – groundwater pumping and surface water appropriations; maximum use	See Site Permit Application
E 2	Describe – Groundwater appropriations in million gallons/year	See Site Permit Application
E 3	Describe – Annual consumption in acre-feet	See Site Permit Application
F	Describe – Potential sources and types of discharges due to operation of the facility	See Site Permit Application
G	Radioactive Releases	See Site Permit Application
H	Describe – Potential types and quantities of solid wastes in tons/year	See Site Permit Application
I	Describe – Audible noise generated	See Site Permit Application
J	Describe – Estimated work force required for construction and operation	See Site Permit Application
K	Describe – Minimum number and size of transmission facilities required to provide a reliable outlet	See Site Permit Application
7849.0340	Alternative of No Facility	See Site Permit Application
A	Describe – Expected operation of existing and committed generating and transmission facilities	See Site Permit Application
B	Describe – Changes in resource requirements and wastes produced by facilities discussed in A and in items B 1-11 including land, traffic, fuel, emissions, water consumption and discharge, reject heat, radioactive releases, solid waste, noise and labor	See Site Permit Application
C	Describe – Equipment and measures that may be used to reduce the environmental impact of the no facility alternative	See Site Permit Application

1.0 Introduction

1.1 PURPOSE OF CERTIFICATE OF NEED APPLICATION

A large electric generating facility ("LEGF") having an output of greater than 50 MW, any high-voltage transmission line (with a capacity of 200 kilovolts ("KV") or more or with a capacity of 100 KV that meets other specific criteria), and any pipeline (greater than six inches in diameter that meet certain criteria or for transporting natural or synthetic gas at pressures in excess of 200 psi) must first receive a Certificate of Need from the Minnesota Public Utilities Commission ("MPUC") before the Environmental Quality Board ("EQB") can issue a Site Permit.

This application submittal fulfills the data request requirements as prescribed under Minn. R. Part 7849 (7849.0010 -7849.0400). There are a variety of criteria set forth under Minnesota Rules Part 7849 that the MPUC uses in evaluating need, including energy demand forecasts, conservation improvements, enhancements to regional reliability, environmental issues, and alternates to satisfying the demand. This submittal provides necessary information to assist the MPUC in completing that evaluation.

1.1.1 Scope of Application

Mankato Energy Center, LLC ("Mankato Energy") has committed to supply approximately 375 MW (winter conditions) of electric power to Northern States Power ("NSP") d/b/a Xcel Energy, after being selected in a bidding process approved by the MPUC in its acceptance of Xcel Energy's resource planning process. See Docket E-002/RP-00-787. An electric power plant, selected in a bidding process, approved by the MPUC is exempt from Certificate of Need proceedings. See Minn. Stat. §§ 216B.243; 216B.2422, subd. 5(c). In the Exemption Order dated February 6, 2004, the MPUC concurred with this statement by establishing that the scope

of data required in the Application for a Certificate of Need relates only to demonstrating a need for the power it would generate for the wholesale market, not the power to be sold to Xcel Energy. The MPUC clarified this statement by requiring the applicant to provide information on the Project as a whole, including both the portion of the Facility that will supply power to Xcel Energy and the additional facilities associated with supplying power to the wholesale market if deemed necessary to issue the Certificate of Need. This document focuses on the non-exempt portion of the facility.

1.1.2 Exemptions from Submittal of Data

Minn R. 7849.0200, subp. 6allows an applicant, before submitting a Certificate of Need Application, to seek an exemption from data that "is unnecessary to determine the need for the proposed facility or may be satisfied by submitting another document." Such an exemption was granted by the MPUC on February 6, 2004. See Order Granting Exemptions from Filing Requirements and Limiting Scope, *In the Matter of the Application of Calpine Corporation for a Certificate of Need for a Large Electric Generating Facility* (the "Exemption Order"). A copy of this Exemption Order and supporting documentation is provided in Appendix A. Accordingly, this Application will address only those requirements for which an exemption has not been allowed or in accordance with the data requirements specified in the Exemption Order.

Data requirements Minnesota Rules deemed to be exempt or modified by the Commission in the exemption order include the following:

- Part 7849.0250, Items B(1) to B(3) (Alternatives) – In its request for exemption from certain data requirements, specifically those set forth in Part 7849.0250, Items B(1) to B(3), Mankato Energy stated that it is not in the business of purchasing power, nor it does not have existing generation facilities in Minnesota to which efficiency improvements could be applied, and that it does not own or operate transmission facilities. Accordingly, Mankato Energy argued that it cannot address these alternatives in the Application. Instead, Mankato Energy proposed to fully discuss the alternatives of a generating facility of a different size or using a different energy source pursuant to Part 7849.0250, Item B(4). Based on the

arguments presented and the alternative proposed, the MPUC agreed to grant the exemption for the data requirements in Items B(1) to B(3).

- Part 7849.0250, Item C(7) (Facility's Effect on Rates on Systemwide) – Mankato Energy requested an exemption from Part 7849.0250, Item C(7) based on the fact that it does not have a "system" as defined in the MPUC rules and does not have regulated rates for the power it will generate. Instead, Mankato Energy proposed to submit data on the Project's impact on state or regional wholesale prices. Based on the arguments presented and the alternative proposed, the MPUC agreed to grant the exemption for the data requirements in Item C(7).
- Part 7849.0250, Item D (System Map) – Mankato Energy requested an exemption from Part 7849.0250, Item D based on the fact that it does not have a system and therefore cannot prove a map of its system. Instead, Mankato Energy proposed to include maps showing the proposed site and its location relative to the power grid and natural gas supplies. Based on the arguments presented and the alternative proposed, the MPUC agreed to grant the exemption for the data requirements in Item D.
- Part 7849.0270 (Peak Demand and Annual Consumption) Mankato Energy requested an exemption from Part 7849.0270 based on the assertion that it cannot provide forecast data for its system (peak demand and annual electrical consumption) because it does not have a system. Instead, Mankato Energy proposed to submit regional demand, consumption, and capacity data from credible sources to show the need for the independently produced energy it would generate at the Facility. Based on the arguments presented and the alternative proposed, the MPUC agreed to grant the exemption for the data requirements in Part 7849.0270.
- Part 7849.0280 (Ability of Existing System to Meet Electrical Demand) – Mankato Energy requested an exemption from Part 7849.0280 based on the fact that it does not have a system as defined by the rules. Instead, Mankato Energy proposed to submit regional demand, consumption, and capacity data from credible sources to show the need for the independently produced energy it would generate at the Facility. Based on the arguments presented and the alternative proposed, the MPUC agreed to grant the exemption for the data requirements in Part 7849.0280.

- Part 7849.0290 (Energy and Conservation Plans) – Mankato Energy requested an exemption from Part 7849.0290 based on the fact that it is not a regulated utility that is required to give conservation the same consideration that it gives new generation when planning to meet the future needs of its service area. As "End-Use Conservation" does not have the same meaning for a wholesale supplier as it does for a utility with end-use customers, the MPUC agreed that Mankato Energy is exempt from this data element.
- Part 7849.0300 (Effect on Delay on Systems and Power Pool) – Mankato Energy requested an exemption from Part 7849.0300 based on the fact the requirements of this rule are inapplicable because it does not have a system. Instead, Mankato Energy proposed to provide data on the consequences of delay to its potential customers and to the region. Based n the arguments presented and the alternative proposed, the MPUC agreed to grant the exemption for the data requirements in Part 7849.0300.
- Part 7849.0340 ("No Facility" Requirement) – Mankato Energy requested an exemption from Part 7849.0340 based on the fact this rule is not directly applicable because Mankato Energy does not operate a system as defined by the rules. Instead, Mankato Energy proposed to provide data reasonably available to it regarding the impact on the wholesale market of the "no-facility" alternative.
- Part 7849.0240, subp 2, Item B (Relationship to Promotional Activities) – Mankato Energy requested an exemption from Part 7849.0240, subp 2, Item B based on the fact that such information is not necessary to determine the need for an independent power producer's project because the proponent has not engaged in any promotional activities and lacks data to report. Based on the arguments presented, the MPUC agreed to grant the exemption to Mankato Energy in its entirety.

1.2 APPLICANT INFORMATION

Mankato Energy, a wholly owned subsidiary of Calpine Corporation, is filing this Application for a Certificate of Need ("Application") to construct and operate a natural gas-fired combined cycle electric generating facility at a site near Mankato, Minnesota (the Facility).

Calpine Corporation is an innovative, fully integrated independent power producer committed to providing competitively priced, reliable energy. It is the world's largest producer of renewable geo-thermal power, and is focused on the development of clean, efficient, combined cycle, natural gas fired generation. Developments of projects like the Mankato Energy Center will position the company as the nation's most fuel-efficient power provider.

1.3 CORRESPONDENCE

Correspondence relative to the Mankato Energy Center should be directed as follows:

Company Representative
Mr. Jason M. Goodwin, P.E.
Regional Manager – Safety, Health & Environmental
Midwest Power Region
4100 Underwood
Pasadena, Texas 77507
(832) 476-4463
jgoodwin@calpine.com

1.4 GENERAL PROJECT DESCRIPTION

Mankato Energy proposes to build a power plant capable of producing approximately 655 megawatts of power at summer ambient conditions and 730 MW at winter conditions using natural gas-fired combustion turbines in a combined cycle configuration. Low sulfur distillate oil will be used as a back-up fuel. The Facility will be designed to include two combustion turbine generators, two heat recovery steam generators equipped with duct burners, one steam turbine with an associated heat rejection system, and various appurtenant machinery and equipment required for a safe and efficient operating power plant.

The Facility site is located north of the Mankato city limits within Lime Township, and is approximately 25 acres in size. The area is currently zoned for industrial use. The City of Mankato and Lime Township entered into a Joint Resolution for Orderly Annexation on November 12, 1997 whereby the parties agreed that the City of Mankato would annex areas to be developed for residential, commercial, industrial, and governmental purposes so as to encourage orderly urban development using municipal services in a responsible, controlled, and environmentally sound manner. Figure 1.

The Facility will connect to the Northern Natural Gas pipeline located approximately 3.2 miles east of the Facility site. The site has direct access to the transmission grid via the Wilmarth Substation located approximately 1,000 feet directly west of the site; thus, the Facility will not require construction of a lengthy, off-site high voltage transmission line Figure 2. Additional project description information is provided under Section 2 "Project Description" of this Application.

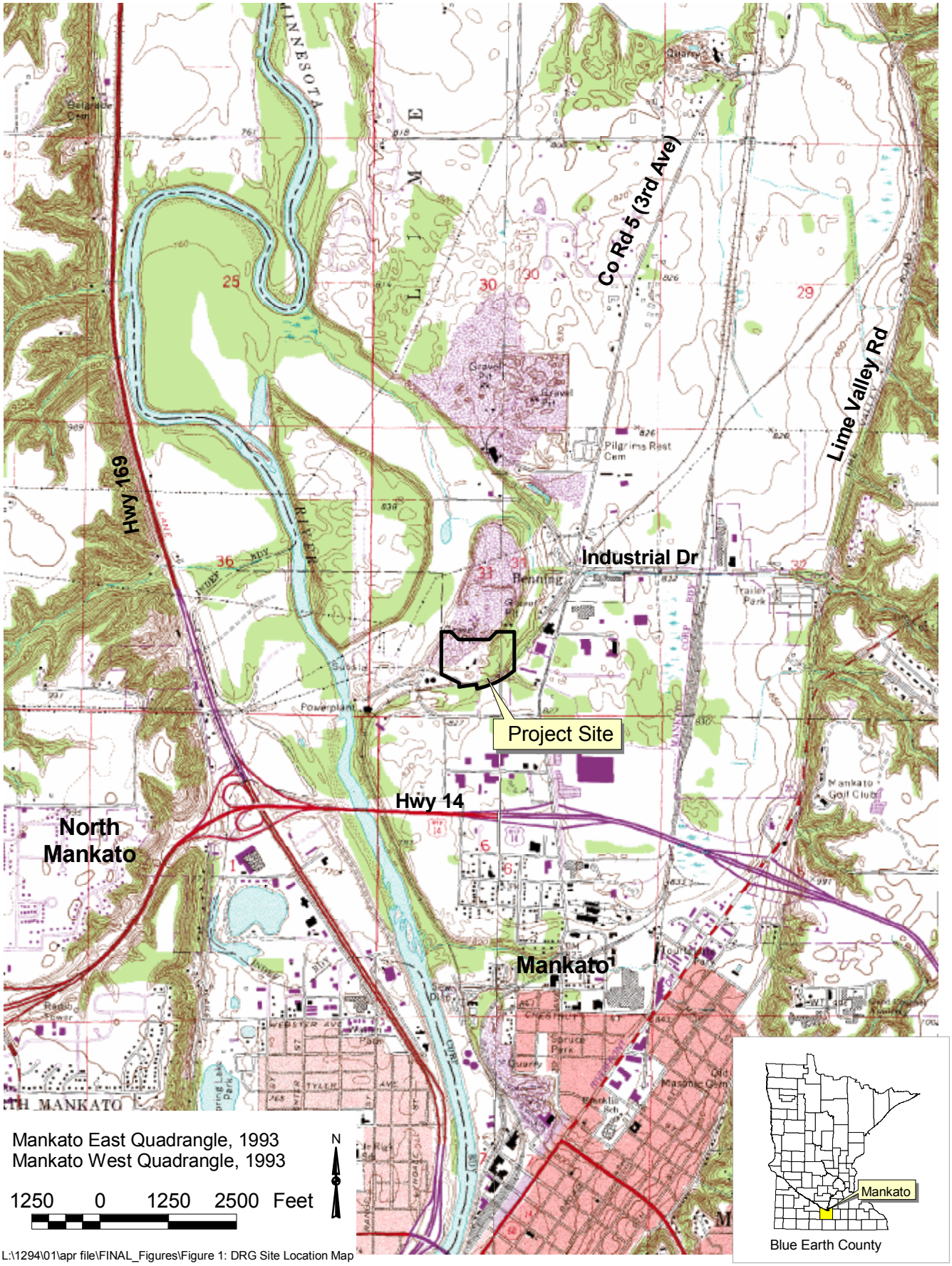
1.5 FEES

Minnesota Rules 7849.0210 Subpart 1 states that the fee for processing a large electric generating facility application shall be $10,000 plus $50 for each megawatt of plant capacity. Based on this rule, the application fee would be $27,750. Below is a description of how the fee was calculated.

Base Fee	$ 10,000.00
MW Based Fee ($50/MW (($50 X 730MW))	$ 36,500.00
MW Exemption ($50/MW (($50 X 375MW))	$(18,750.00)
Total	$27,750.00

Per the requirements of Minnesota Rules 7849.0210 Subpart 2, payment of 25 percent of the required processing fee, or $6,937.50 is being submitted to MPUC with this Application.

Mankato Energy will pay the balance of the processing fee in accordance with the schedule outlined in Minnesota Rules 7849.0210 Subpart 2.



L:\1294\01\apr file\FINAL_Figures\Figure 1: DRG Site Location Map

MANKATO ENERGY CENTER	Wenck Associates, Inc. Environmental Engineers — 1800 Pioneer Creek Center, Maple Plain, MN 55359-0249	MAR 2004
Site Location Map (USGS Quadrangle)		Figure 1

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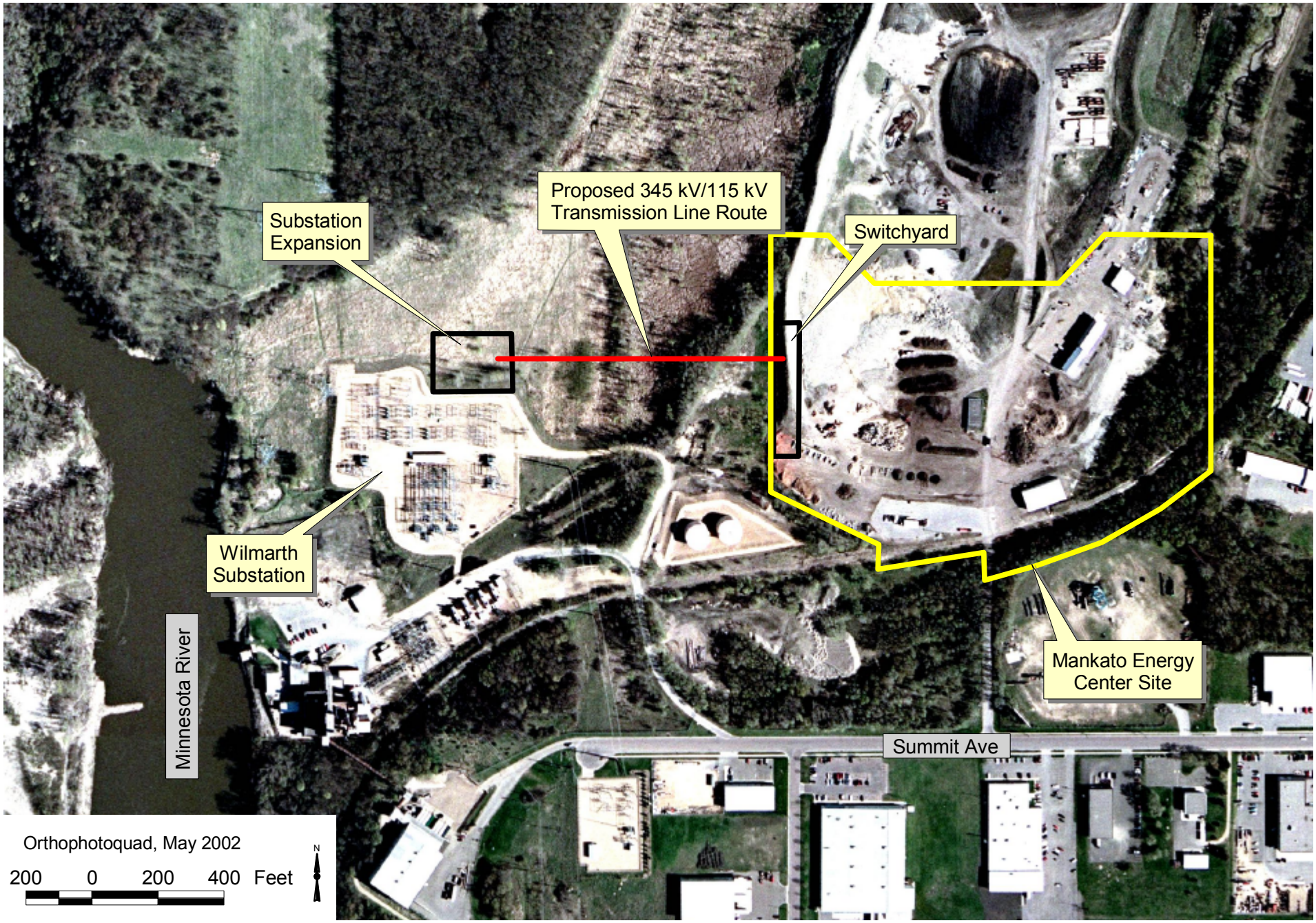


L:\1294\01\07\apr file\transmission.apr\Figure 8: Proposed Transmission Line Route Note: May 2002 1-m DOQs (source: Calpine)

MANKATO ENERGY CENTER	COPYRIGHT Wenck Associates, Inc. Environmental Engineers — Wenck — 1800 Pioneer Creek Center Maple Plain, MN 55359-0249	MAR 2004
Proposed Transmission Line Route		Figure 2

2.0 Project Description

2.1 MAJOR EQUIPMENT

The Mankato Energy Center will be a natural gas-fired, combined cycle electric generating facility consisting of two combustion turbine generators ("CT"), two heat recovery steam generators ("HRSG"), one steam turbine generator ("ST"), one condenser, one multi-cell mechanical draft evaporative cooling tower, and certain other appurtenant pieces of machinery and equipment that are required for a safe and efficient operating power plant. The Facility will be equipped to operate with low sulfur distillate fuel oil as a backup fuel for as many as 875 hours per year per turbine. The Facility will be capable of generating a net electrical output of approximately 505 MW under normal conditions (summer ambient conditions) with the capability of generating an additional 150 MW from duct firing and steam injection to meet peak load demand.

The combustion turbines can be operated independently to meet electric power demand. In such mode of operation, the generating capability of the Facility will be approximately 245 MW at summer conditions and 290 MW at winter conditions with an additional 85 MW available from duct firing. It is the power that is generated in this fashion, i.e., from the additional CT/HRSG train that is the subject of this Application.

Other equipment associated with the power plant include: process water systems, consisting of water pretreatment equipment, a fire/service water storage tank, demineralization units and two demineralized water storage tanks; wastewater collection and treatment system; a stormwater collection system and detention pond; fuel supply systems, consisting of a natural gas conditioning system and a distillate fuel oil storage and handling system; fire protection systems; plant buildings; steam supply piping; and plant electrical systems. Additional water treatment facilities, including a raw water storage pond, will be located on land owned by the City of

Mankato that is part of the municipal water treatment plant. It is contemplated that these additional water treatment facilities will be designed and constructed by Mankato Energy, but owned by the City of Mankato. Figure 3 is a process flow diagram of the Mankato Energy Center process. Figure 4 is a site layout of the proposed facility.

The generation of electric power at the Facility begins with the introduction of fuel in the combustion turbine where it is ignited. The hot combustion gases that are generated pass through a series of blades that rotate the turbine. The rotation of the turbine turns a shaft connected to a generator that is paired with that CT/HRSG unit. Rotation within the generator produces electricity. In a "combined cycle" plant, heat from the combustion turbine exhaust is directed to the HRSG instead of being exhausted directly up the stack to the atmosphere. This heat, which would otherwise be wasted, converts water that flows through tubes in the HRSG into steam. The steam that is produced in the HRSG is directed to a steam turbine where it passes through a series of blades that rotate another turbine. Rotation of that turbine produces additional electric power. After the steam does its "work" in the steam turbine, it is directed to a condenser where it passes over a series of tubes that contain cooling water. The steam is condensed back to its liquid state as it passes over the tubes then cycled again through the production process. The cooling water is directed to a cooling tower where it gives up to the atmosphere the heat that it absorbed from the steam. Once its temperature is lowered in the cooling tower, the cooling water is cycled again to the condenser.

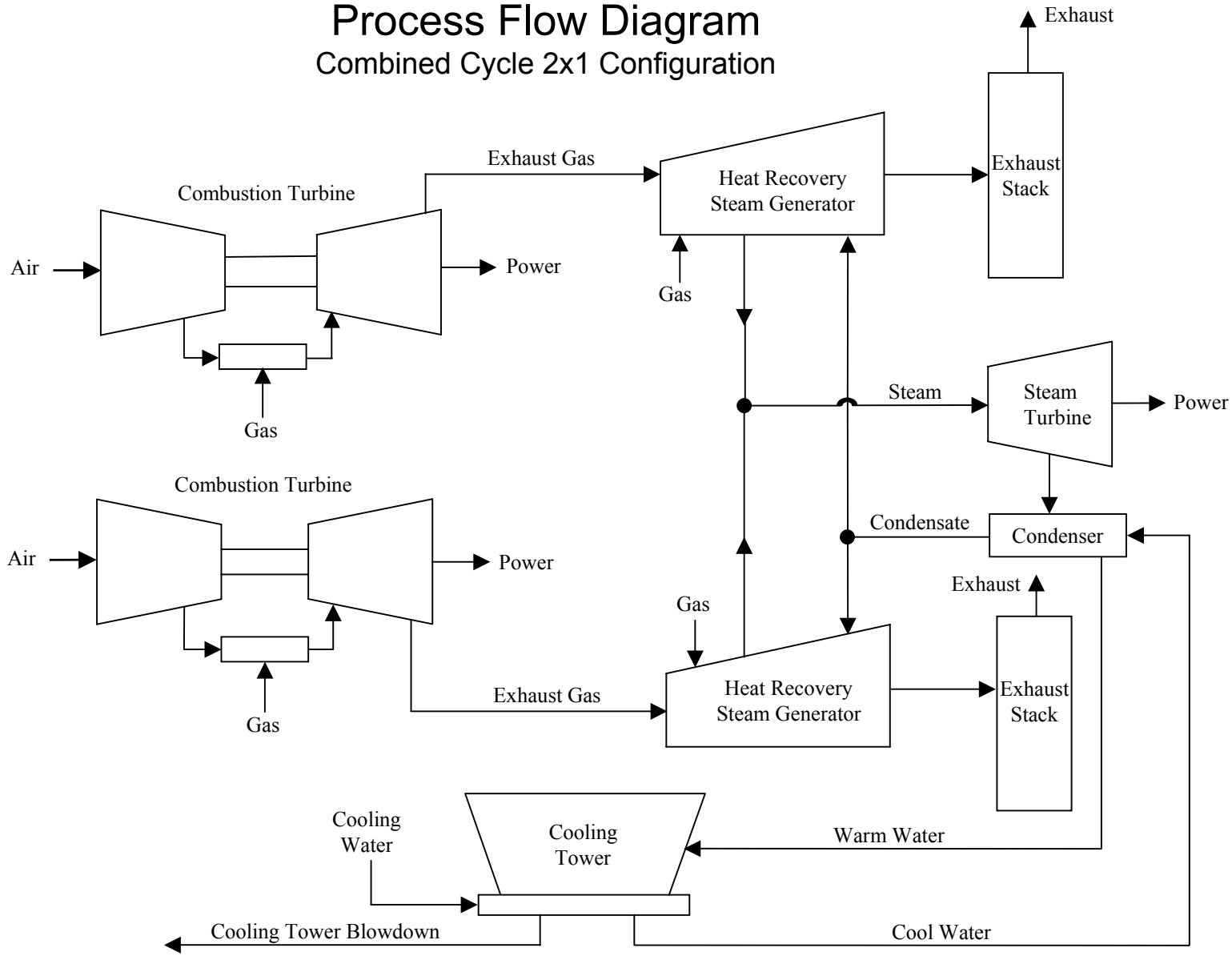
The advantage of the combined cycle plant over a conventional fired boiler plant is efficiency: the same amount of fuel is used to generate approximately 40 percent more electricity.

Mankato Energy proposes to build a plant where steam will be generated in two HRSGs that will simultaneously direct the steam produced therein to the single steam turbine. This configuration offers increased operational flexibility, lower maintenance costs due to the shared facilities, and conservation of resources in that less land, labor, and materials are used as compared with a combined cycle plant with a single CT/HRSG unit on an installed megawatt basis. With very few exceptions, all equipment and machinery used in the Facility will be same for a 1x1 plant,

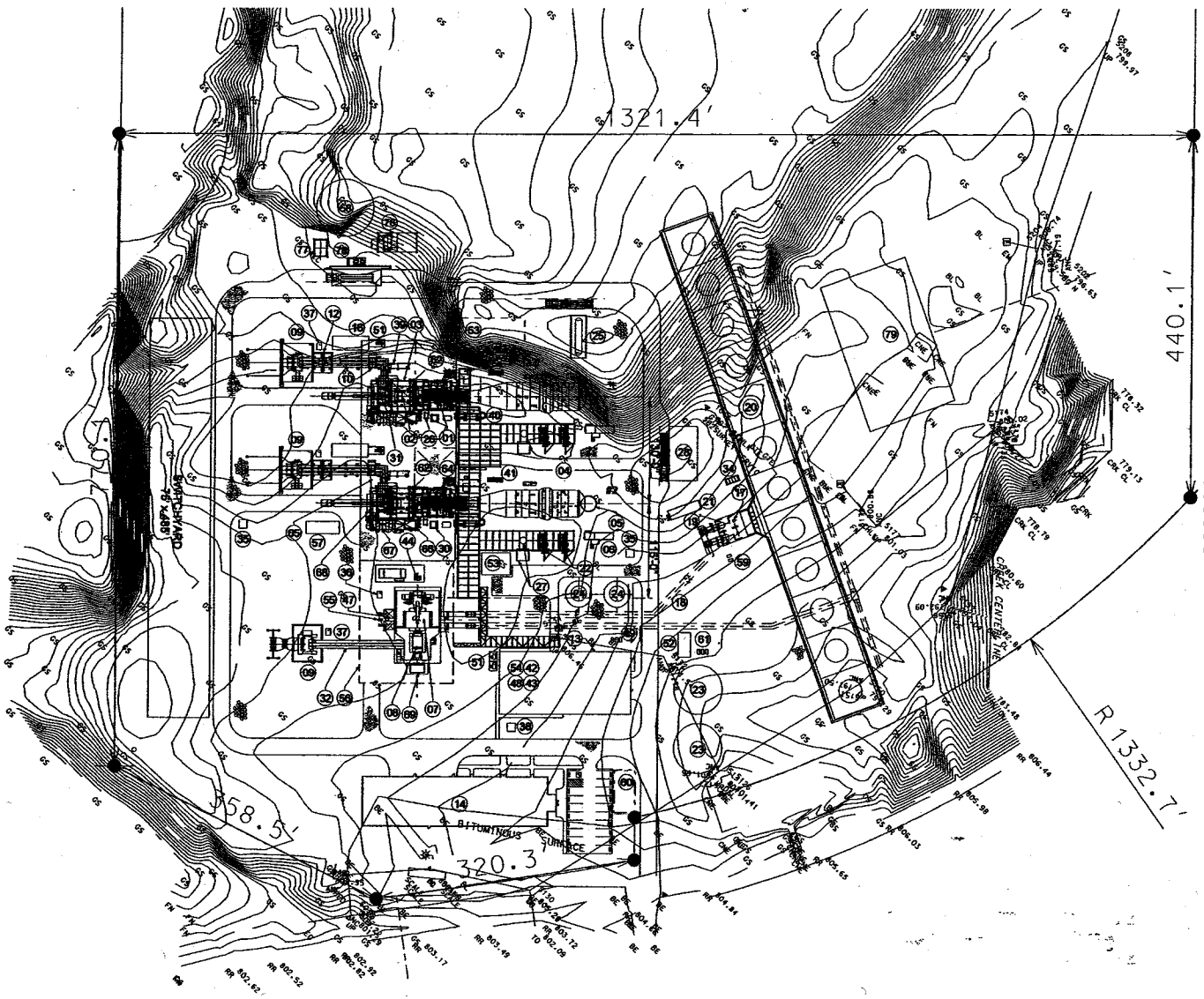
Mankato Energy Center

Process Flow Diagram

Combined Cycle 2x1 Configuration



MANKATO ENERGY CENTER	Wenck Wenck Associates, Inc. Environmental Engineers 1800 Pioneer Creek Center Maple Plain, MN 55359	MAR 2004
Process Flow Diagram		Figure 3



LEGEND

1. COMBUSTION TURBINE
2. CT GENERATOR
3. CT AIR INLET
4. HRSG
5. HRSG STACK
6. CEM/HRSG POWER DISTRIBUTION CENTER
7. STEAM TURBINE
8. ST GENERATOR (HYDROGEN COOLED)
9. GENERATOR STEP-UP TRANSFORMER
10. CT GENERATOR CIRCUIT BREAKER
11. NOT USED
12. UNIT AUXILIARY TRANSFORMER
13. WATER TREATMENT & BOP ELECTRICAL CONTROL BLDG
14. ADMIN/MAINTENANCE/WAREHOUSE/CONTROL ROOM BLDG
15. PRIMARY FUEL GAS CONDITIONING AREA
16. CTC POWER DISTRIBUTION CENTER
17. AUX COOLING WATER PUMP
18. CIRCULATING WATER LINES
19. CIRCULATING WATER PUMPS
20. COOLING TOWER
21. COOLING TOWER POC
22. BOILER FEED PUMPS
23. SERVICE / FIRE WATER STORAGE TANK
24. DEMIN. WATER STORAGE TANK
25. AMMONIA STORAGE TANK
26. HYDRAULIC UNIT
27. BLOWDOWN TANK & SUMP
28. COOLING TOWER CHEMICAL FEED ENCLOSURE
29. FUEL GAS CONDITIONING SKID
30. WATER WASH TANK
31. WATER WASH SKID
32. ISO PHASE BUS DUCT
33. AMMONIA INJECTION SKID
34. OIL/WATER SEPARATOR
35. OIL / WATER SUMP & PUMP
36. 345kV ACT/VT METERING UNITS
37. CTC LCI/GENERATOR EXCITATION COMPARTMENT
38. CHEMICAL AREA SUMP & PUMP
39. CT FOGGING SKID
40. ROTOR AIR KETTLE
41. DUCT BURNER SKID
42. SAMPLE PANEL & LAB
43. CYCLE CHEMICAL FEED
44. STG LUBE OIL & EHC EQUIPMENT SKID
45. NOT USED
46. NOT USED
47. CONDENSER
48. AIR COMPRESSORS & DRYERS
49. DEMIN. WATER PUMPS
50. FUEL GAS DEWPOINT HEATER
51. SUS TRANSFORMER 4160-480 V
52. FIRE PUMP SKID ENCLOSURE
53. AUXILIARY BOILER
54. ELECTRICAL ROOMS
55. CONDENSATE PUMPS
56. STG BUILDING ENCLOSURE
57. STANDBY DIESEL GENERATOR
58. FUEL OIL STORAGE TANK
59. CLOSED COOLING WATER PUMPS & HEAT EXCHNGRS
60. PLANT WASTEWATER SUMP & PUMPS
61. SERVICE WATER PUMPS
62. CRANE AREA / MAINTENANCE
63. NOT USED
64. MAIN & PILOT FILTER SEPARATOR
65. CT PECCC
66. MECHANICAL PACKAGE
67. ELECTRICAL PACKAGE
68. STARTING PACKAGE
69. STG GENERATOR EXCITATION COMPARTMENT
70. NOT USED
71. NOT USED
72. NOT USED
73. NOT USED
74. NOT USED
75. NOT USED
76. FUEL OIL FORWARDING SKID
77. FIRE FOAM HOUSE
78. FUEL OIL UNLOADING STATION
79. STORMWATER POND W/ DISCHARGE TO CREEK

REV	DATE	DESCRIPTION	DRAWN	CHECKED	ENGINEER	PROJECT ENGINEER
A	11-01-03	PRELIMINARY	CE	BA	BA	

DRAWN BY: ETHRIDGE C 11-01-03
CHECKED BY: ANDERS B 11-01-03
ENGINEER: - -
PROJECT ENGINEERING MANAGER: - -
PROJECT MANAGER: - -

CALPINE

PROJECT NO.

MANKATO ENERGY CENTER GENERAL ARRANGEMENT

SCALE: 1" = 60'-0"

DWG. NO. MK-G-1001 REVISION A

24x36

which is needed to meet the requirements of the PPA, as for a 2x1 plant, which is the size of the plant proposed by Mankato Energy. These exceptions are described at the appropriate places in this Application. As previously stated, those portions of the Facility that are used to satisfy the requirements of the PPA are statutorily exempt from the Certificate of Need process pursuant to Minn. Stat. §§ 216B.243; 216B.2422, subd. 5(c).

Cooling and process water will be supplied by effluent taken from the Mankato municipal wastewater treatment system, which is located approximately one mile south of the Facility site on the east bank of the Minnesota River. The municipal wastewater will be filtered and treated prior to delivery to the Facility's cooling tower at a new treatment facility that is expected to be located on land adjacent to the existing municipal treatment plant. Cooling tower blowdown as well as a small amount from Mankato Energy's demineralization system will be discharged to the Minnesota River in accordance with applicable discharge limits. Both the pipeline used to supply the treated water to the Facility and the pipeline used to discharge the water from the Facility to the Minnesota River will be slightly larger than were the Facility built only to accommodate the supply obligations set forth in the PPA. The water supply pipeline, which is currently designed to be 16 inches in diameter, would be 12 inches in diameter were the Facility designed only to meet the needs of the PPA. Similarly, the water discharge line would be 8 inches in diameter versus the current design of 10 inches. The slightly larger size of these pipelines will not cause any significant additional impacts to the environment during construction or operation of the Facility. Likewise, the increased size will have an insignificant impact on the cost of the Project.

The Facility's cooling tower is currently designed with 12 cells. Were the Facility to be constructed solely to meet the requirements of the PPA, it is likely that the design could be reduced to only seven (7) cells. The additional cells associated with the cooling tower will not cause any significant additional impacts to the environment during construction or operation of the Facility. Likewise, the increased size will have an insignificant impact on the cost of the Project.

2.2 PROJECT LOCATION

The Facility site consists of approximately 25 acres in Lime Township, Blue Earth County, Minnesota. The area is currently zoned for industrial use. The City of Mankato and Lime Township entered into a Joint Resolution for Orderly Annexation on November 12, 1997, whereby the parties agreed that the City of Mankato would annex areas to be developed for residential, commercial, industrial, and governmental purposes so as to encourage orderly urban development using municipal services in a responsible, controlled, and environmentally sound manner.

The area surrounding the Facility site consists of industrial and light industrial activities, as well as certain commercial establishments. These include a demolition waste landfill operation, a residential hazardous waste receiving center, a U.S. Postal Service distribution center, an auto salvage yard, and other similar businesses.

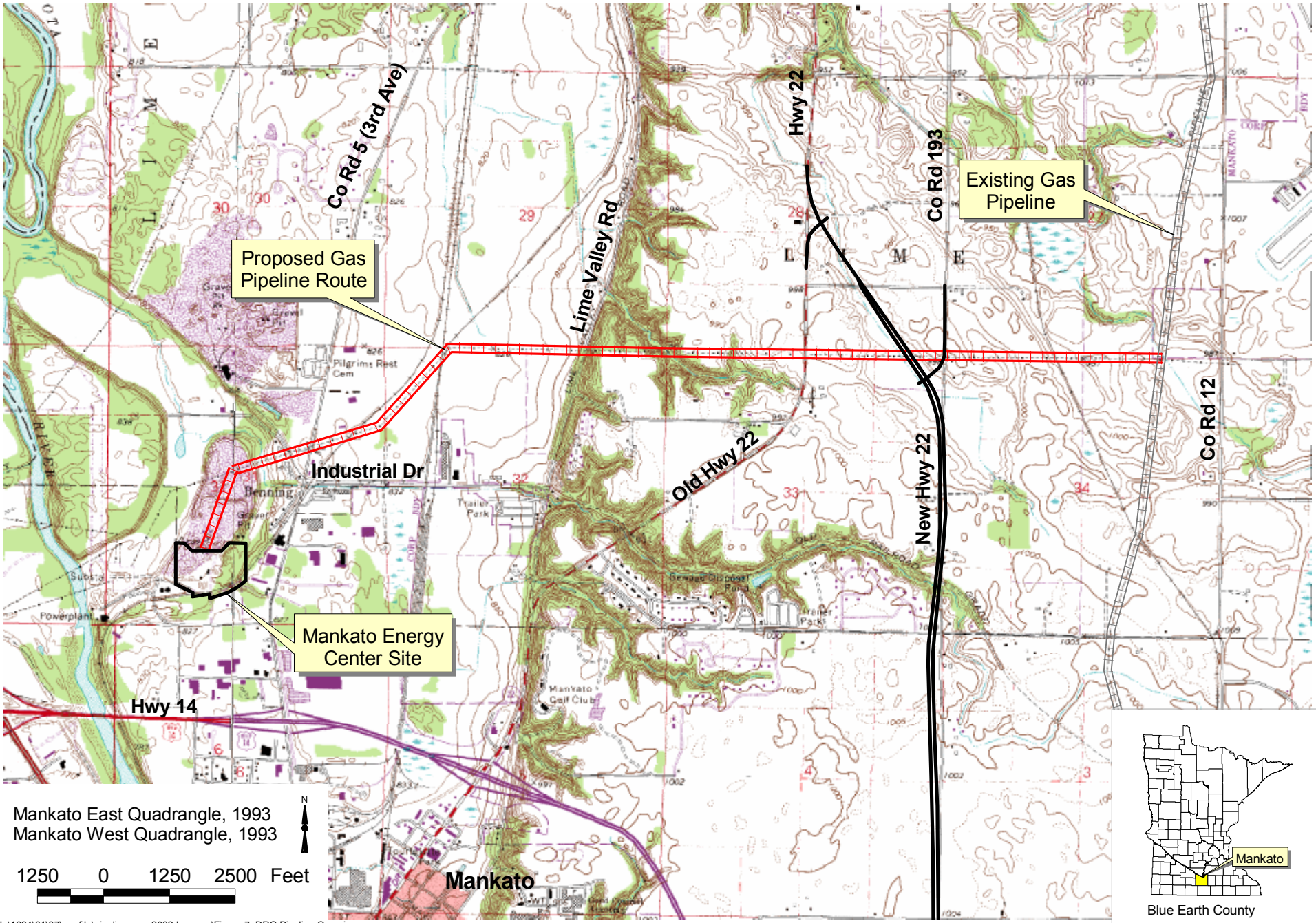
2.3 FUEL SUPPLY

The primary fuel for the Facility will be natural gas. Low sulfur distillate oil will be used as a back-up fuel.

2.3.1 Pipeline Route

Natural gas will be delivered to the Facility through a new 16-inch diameter pipeline that will be routed from the Facility site to the Northern Natural Gas Company mainline. This lateral line will be about 3.2 miles in length. Figure 5 is a map of the pipeline route.

The natural gas pipeline will be built to deliver natural gas to that portion of the Facility that is statutorily exempt from the Certificate of Need process pursuant to Minn. Stat. §§ 216B.243; 216B.2422, subd. 5(c). In order to accommodate the gas requirements of the portion of the Facility that is the subject of this Application, the pipeline will be slightly oversized in order to



L:\1294\01\07\apr file\pipeline_may2002doqs.apr\Figure 7: DRG Pipeline Overview

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Proposed Natural Gas Pipeline Route		Figure 5

accommodate the additional gas usage attributable to the portion of the Facility that is the subject of this Application. Were only the statutorily exempt portion of the Facility to be built, the pipeline would be 12 inches in diameter. The installation of the slightly larger diameter pipeline will not cause any additional impacts to the environment during the construction or operation phase of the Project. The impacts associated with the incremental gas usage (over and above the usage attributable to the exempt portion of the Facility) are discussed below.

2.3.2 Distillate Oil

Above ground storage tanks will be installed at the Facility to store low sulfur distillate fuel oil as a back-up fuel supply during periods when natural gas is not available and the Facility must generate and supply electricity to the grid. The storage capacity will be as much as 900,000 gallons, which represents approximately 36 hours of uninterrupted, baseload electricity generation at the Facility for the either the 2x1 or the 1x1 configuration.[4] Mankato Energy has agreed to limit the Facility's use of the fuel oil to 875 operating hours per year per combustion turbine (based on an 12-month rolling average). The fuel oil storage will be situated on the northern portion of the Facility, and will be constructed using a "tank within a tank" design. The outer tank will be sized to contain 110 percent of the inner tank's working volume. The tank storage capacity will meet the compliance requirements of all applicable state aboveground storage and federal Spill Prevention Control and Countermeasures ("SPCC") regulations. The low sulfur distillate fuel oil will be delivered to the Facility site via tanker truck. The tanker truck unloading area will also be equipped with secondary containment in accordance with federal SPCC requirements. The incorporation of low sulfur distillate fuel oil capability increases the operating flexibility of the Facility in that having the ability to switch fuel sources can mitigate the restrictions or interruptions of natural gas supplies.

[4] Were Mankato Energy to build the Facility to satisfy only the needs of the PPA, the above ground fuel oil storage capacity would be roughly half, or 450,000 gallons. In any event, the storage capacity would be sufficient to satisfy the back-up fuel requirements for accreditation by MAPP.

2.3.3 Adequacy of Natural Gas Supply

Operation of the Facility will not have a significant impact on the availability or price of natural gas in Minnesota. In summary, (i) recent long-term forecasts for the United States energy market indicate that growth in domestic production and increased imports of liquefied natural gas ("LNG") will support expanded natural gas use for power generation; (ii) pipeline delivery capacity into Minnesota is more than adequate to supply the new gas-fired generating facilities that have been proposed, including both the statutorily exempt portion of the Facility and the portion that is the subject of this Application; and (iii) due of its location and alternate fuel capability, the Facility will not require significant investment in new pipeline facilities in order to operate.

2.3.4 U.S. Natural Gas Supply Outlook

Despite concerns about tightening natural gas supplies, recent forecasts indicate that natural gas supplies will be available to meet growing demand for natural gas in all market sectors, including electric power generation. The Energy Information Administration's ("EIA") 2004 Annual Energy Outlook shows deliveries to gas consumers in the United States increasing from 20.8 trillion cubic feet ("Tcf") in 2002 to 25.9 Tcf in 2015. A large share of this increase will come from the electric generation sector, where natural gas use is expected to grow from 5.6 Tcf in 2002 to 7.6 Tcf in 2015. The EIA 2004 Base Case also indicates that 50,000 MW of combined-cycle generating capacity is expected to go into commercial operation between 2002 and 2010. This is equivalent to nearly 80 new generating facilities the size of Mankato Energy Center.

Sources of increased gas supplies will include offshore gas production in the deepwater Gulf Coast region, conventional gas and coal-bed methane production in the Rocky Mountain area, and imports of LNG. These new supplies will more than offset declines in production in other on-shore producing areas and any possible reduction in imports from Canada. Although timing is uncertain, a new pipeline from Alaska may be completed sometime in the next decade, which would allow for the delivery of an additional 1.5 Tcf per year into the North American market.
This expansion of natural gas supplies is expected to occur without further increases in natural gas prices. The EIA projects that the wellhead natural gas price, which will average just under

$5.00 per thousand cubic feet in 2003, will decline to under $3.50 (2002$) in 2010, and remain below $4.50 through 2025.

2.4 MINNESOTA GAS MARKETS

Minnesota consumes about 0.35 Tcf of natural gas per year, or approximately 1,000 million cubic feet ("MMcf") per day. Over two-thirds of this gas is delivered to residential and commercial customers, who use gas primarily for space heating. Industrial customers account for another 25 to 30 percent of the market. Because of the importance of heating demand, daily gas consumption by residential, commercial, and industrial customers during a peak winter month is about twice the average rate of gas use over the year.

Natural gas use for electric generation currently accounts for less than five percent of the Minnesota market.[5] By contrast, the electric power sector accounted for 26 percent of the natural gas delivered to consumers in the United States during 2002. Much of the gas consumed for power generation in Minnesota is used in peaking plants that operate a limited number of hours each year, mainly in the summer. Although an increasing amount of gas will be used in combined-cycle generating facilities operating at higher capacity factors, gas use for electric generation should continue to be higher during the summer than in the winter months.

2.4.1 Gas Delivery Capacity

Minnesota is not a gas producing state, and gas storage and propane-based peaking facilities located within the state provide only a small portion of the total gas supply. Minnesota therefore

[5] The 2001 Energy Planning Report issued by the Minnesota Department of Commerce includes information that illustrates the relative percentage of fuels used to generate electricity that is consumed in Minnesota. The Report shows that approximately 92 percent of all electric generation serving Minnesota comes from coal or nuclear facilities. See Energy Planning Report p. 15. Natural gas is shown to account for only one percent of the electric generation. While the use of natural gas for power generation is on the increase, the increase is not expected to significantly change the relative percentages; nor is it expected to lead to any capacity constraints on the pipelines serving the state. See discussion in Section 2.5.1.

depends heavily on pipeline deliveries from outside the state to meet its gas requirements. Five interstate gas pipeline systems currently deliver gas into Minnesota: Northern Natural Gas (Northern Natural), Northern Border Pipeline (Northern Border), Viking Gas Transmission (Viking Gas), Great Lakes Gas Transmission (Great Lakes), and Alliance Pipeline (Alliance). These pipelines provide direct access to the Texas, Mid-Continent, Rocky Mountain, and Western Canadian gas-producing areas, and indirect access to Gulf Coast gas supplies and the large natural gas storage fields in Michigan and Illinois.

Of these systems, Northern Natural has the largest network of pipelines within the state. Much of the natural gas that is transported into Minnesota by one of the other pipelines is delivered into Northern Natural, which then redelivers the gas to local distribution companies, municipal utilities, and large end users. Major pipeline interconnection points include Carlton, Minnesota, where Northern Natural connects with Great Lakes, and Ventura, Iowa, the point just south of the Minnesota-Iowa border where Northern Natural receives gas from the Northern Border system.

The combined pipeline capacity entering Minnesota is about 8,500 MMcf/day, or nearly nine times the state's daily gas use. This indicates that there is more than enough pipeline capacity entering the state to meet existing requirements and supply new loads. At the same time, however, the fact that gas can flow into Minnesota does not mean that natural gas will be available where and when it is needed. In particular, because Northern Border, Great Lakes, Viking have only limited connections to in-state markets, and Alliance currently delivers no gas within the state at all. The supply of gas to consumers within Minnesota depends on the capacities of the gas transmission and distribution lines that link the major pipelines with individual gas markets within the state. Based on the size and location of existing gas markets, only 2,000 MMcf of the 8,500 MMcf that can enter Minnesota can be delivered to markets within the state on an average day (Table 2-1). Because Minnesota gas customers use about 1,000 MMcf/day, this means the other 1,000 MMcf/day of pipeline delivery capacity is still available.

In a peak winter month the amount of excess pipeline capacity is much less, but it is still significant. As an example, the highest daily gas use during the 2002-03 winter season occurred in February, when gas deliveries to all Minnesota markets averaged 1,860 MMcf/day. Table 2-1 shows that just under 200 MMcf/day of pipeline capacity was still available, on average, during the month.

TABLE 2-1
MINNESOTA NATURAL GAS SUMMARY

Within-State Capacity	**(MMcf/day)**
NNG - Ventura North	1,725
NNG - Welcome to Minneapolis	150
NNG - Carlton to North Branch	250
Total NNG	2,125
NNG - Deliveries in Wisconsin	(190)
Viking - Direct Deliveries	100
Great Lakes - Direct Deliveries	10
Northern Border - Direct Deliveries	15
Pipeline Fuel	(60)
Pipeline Capacity to MN Markets	**2,000**

Annual Capacity vs. Demand	**(MMcf/day)**
Pipeline Capacity	2,000.0
Non-Electric Consumption	945.2
Existing Electric Generation	41.1
Total End-use Consumption	986.3
Surplus/(Deficit)	**1,013.7**

Peak Month Capacity vs. Demand	**(MMcf/day)**
Annual Pipeline Capacity	2,000.0
Viking - Additional Peak Deliveries	50.0
Peak Pipeline Capacity	2,050.0
Non-Electric Consumption	1,821.4
Existing Electric Generation	37.5
Surplus/(Deficit)	**191.1**

2.4.2 Gas Supply for New Power Generation

Because the capacity of existing pipelines to deliver gas into Minnesota is so much greater than the capacity to deliver gas to individual markets within the state, the gas delivery issues associated with a new gas-fired power plant will depend on the plant's location. For instance, a plant located in an area where the pipeline system is already fully utilized throughout the year will require some amount of investment in new gas delivery facilities, no matter how much surplus capacity is available elsewhere in the state.

Xcel Energy's Metro Emission Reduction Plan ("MERP"), which would add 954 MW of gas-fired generating capacity at the High Bridge and Riverside power plants, is an example of a new gas load that is expected to require significant investments in new pipeline and gas distribution facilities. Xcel Energy has estimated that the regional pipeline facilities and local infrastructure upgrades needed to reliably deliver gas to these two plants will exceed $100 million. Xcel Energy is evaluating several options to expand delivery capacity from the Northern Border and/or Viking pipeline systems to the plants.

At the other extreme, a new gas-fired generating facility that is directly attached to either the Northern Border, Great Lakes, or Viking pipelines, should not require significant new pipeline facilities. Great River Energy's Lakefield Junction plant is an example of this type of load. Lakefield Junction, a 516 MW gas turbine peaking facility in Martin County, Minnesota that began operations in 2001, has its own delivery meter on Northern Border. Instead of competing with existing Minnesota markets for available pipeline capacity, the construction of the new Lakefield Junction delivery point has effectively increased Northern Border's capacity to deliver gas within the state by the amount of the new load. As discussed below, because of its location relative to both the Northern Natural and Northern Border pipeline systems, the Mankato Energy Center's impact on the natural gas deliveries in the state will be closer to the Lakefield Junction example than to the MERP case.

2.5 NATURAL GAS USAGE AT THE FACILITY

The Mankato Energy Center will be a relatively large new gas load in comparison to the current size of the Minnesota market. The Facility as a whole will have a peak daily gas requirement of about 130 MMcf/day. With regard to the incremental portion of the Facility for which Mankato Energy is seeking MPUC approval in this application, the peak gas requirement is estimated to be 2,670 MMBtu/hour, or up to 64 MMcf/day. This latter quantity represents just over three percent of Minnesota's daily gas use during a peak month. On an annual basis, assuming a 90 percent load factor for the combustion turbine and a 40 percent load factor for duct firing, gas consumption in the incremental portion of the Facility is estimated to be 47 MMcf/day, or less than five percent of Minnesota's current annual gas use. Using a more realistic load factor of 60 percent for the combustion turbine and a 20 percent load factor for duct firing, gas consumption in the incremental portion of the Facility is estimated to be 31.6 MMcf/day, or approximately three percent of Minnesota's current annual gas use.[6]

As noted above, natural gas will be delivered to the Facility through a new connection with the Northern Natural Gas mainline that is located approximately 3.2 miles east of the Facility site. The tie-in or delivery point will be located just downstream of Northern Natural's interconnection with Northern Border at Welcome, Minnesota, where up to 175 MMcf/day flows into the Northern Natural system. This segment of the Northern Natural system is further reinforced by connections with Northern Natural's other north-south lines that run between Ventura, Iowa and the Minneapolis-St. Paul market.

During periods when gas supplies in Minnesota are constrained because of high demand or a disruption of pipeline deliveries, the Mankato Energy Center will have the ability to use low sulfur distillate oil to meet all or a portion of its fuel requirements. Both the exempt portion of the Facility and the portion of the Facility that is the subject of this Application will have fuel oil

[6] On an annual basis, assuming the more realistic 60 percent load factor for both of the combustion turbines and a 20 percent load factor for the duct burners in both HRSGs, gas consumption in the Facility as a whole is estimated to be 31.6 MMcf/day, which represents approximately three percent of Minnesota's current annual gas use.

storage capacity sufficient to meet MAPP accreditation requirements. These requirements call for a minimum of 20 hours of full load operation, which equates to a storage capacity of no less than 600,000 total gallons and approximately 300,000 gallons for the portion of the Facility that is the subject of this Application.

2.5.1 Cumulative Impact of New Gas-Fired Generation

The Mankato Energy Center is one of four large-scale combined-cycle generating facilities in active development in Minnesota. If all of these proposed projects are constructed as currently scheduled, the amount of base load and intermediate load generating capacity fueled by natural gas could increase by 1,900 MW between now and 2010. This represents a potential increase in average daily gas use of roughly 300 MMcf/day.

Table 2-2 compares projected average-day gas requirements for electric and non-electric uses with existing delivery capacity to markets within Minnesota through 2010. These figures indicate that there will continue to be excess capacity on an annual basis to support growing non-electric requirements as well as the gas-fired generation that are currently proposed.

Table 2-3 shows the same comparison for a peak month. Because the existing pipeline system within the state currently does not have a large surplus during peak delivery periods, a significant investment in additional gas facilities will be required if all of the new combined-cycle plants must operate on gas during a peak winter month. Under the assumptions used here, 600 MMcf/day of additional within-state delivery capacity could be needed by 2010 to meet growth in both the non-electric and electric markets. The amount of investment in new facilities will be mitigated, however, if new generation facilities are located on or near one of the "through" pipelines, since there will continue to be considerable surplus pipeline capacity entering the state. The need for new gas delivery facilities will also be reduced to the extent that generators with dual fuel capability can switch to oil during periods of high natural gas demand. Because the Mankato Energy Center will be located on a through line and will have back-up fuel oil capability, incremental impacts on Minnesota's gas situation – both due to that portion of the Facility that is the subject of this Application and the Facility as a whole – will not be significant.

TABLE 2-2
NATURAL GAS AVERAGE DAY*

	Average Day MMcf/day							
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Pipeline Capacity	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Non-Electric Gas Use	950	969	988	1,008	1,028	1,049	1,070	1,091
Existing Electric Gas Use	50	50	50	50	50	50	50	50
New Simple Cycle Gas Use	1	1	12	12	16	16	16	16
New Combined Cycle Gas Use			21	91	99	163	227	227
Total Requirements	**1,001**	**1,020**	**1,071**	**1,161**	**1,193**	**1,278**	**1,363**	**1,384**
Surplus/(Deficit)	**999**	**980**	**929**	**839**	**807**	**722**	**637**	**616**

New Electric Generating Capacity

	MW							
Solway	45	45	45	45	45	45	45	45
Blue Lake			320	320	320	320	320	320
Dakota County			150	150	300	300	300	300
Total Simple Cycle	**45**	**45**	**515**	**515**	**665**	**665**	**665**	**665**

	MW							
Faribault			250	250	250	250	250	250
Mankato - Base				375	375	375	375	375
Mankato - Incremental				355	355	355	355	355
High Bridge						515	515	515
Riverside							439	439
Total Combined Cycle			**250**	**980**	**980**	**1,495**	**1,934**	**1,934**

Assumptions

(1) Non-electric gas requirements are 950 MMcf/day in 2003, and increase at a 2% annual rate.

(2) Gas use in existing generating facilities is 50 MMcf/day.

(3) New CT gas requirements based on 10,000 heat rate and 10% annual capacity factor.

(4) New CC gas requirements based on 7,000 heat rate. Capacity factor is 50% in 2005, and increases to 70% in 2009.

*Data supplied by Calpine Corporation.

TABLE 2-3*
NATURAL GAS PEAK MONTH

	Peak Month (MMcf/day)							
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Pipeline Capacity	2,050	2,050	2,050	2,050	2,050	2,050	2,050	2,050
Non-Electric	2,000	2,040	2,081	2,123	2,165	2,208	2,252	2,297
Existing Electric	30	30	30	30	30	30	30	30
Combined-Cycle Plants								
Faribault			45	45	45	45	45	45
Mankato - Base				67	67	67	67	67
Mankato - Incremental				64	64	64	64	64
High Bridge						77	77	77
Riverside							70	70
Subtotal			**45**	**176**	**176**	**253**	**323**	**323**
Total Requirements	**2,030**	**2,070**	**2,156**	**2,329**	**2,371**	**2,491**	**2,605**	**2,650**
Surplus/(Deficit)	**20**	**(20)**	**(106)**	**(279)**	**(321)**	**(441)**	**(555)**	**(600)**

Assumptions

(1) Non-electric gas requirements are 2,000 MMcf/day in 2003, and increase at a 2% annual rate.
(2) Gas use in existing generating facilities is 30 MMcf/day.
(3) New CT facilities are assumed not to run on gas during a peak month.
(4) Faribault gas requirements based on 7,000 heat rate, adjusted for winter operations.
(5) High Bridge and Riverside peak usage from MPSC Docket E002/M-02-633

*Data supplied by Calpine Corporation

2.6 FIRE PROTECTION

The Facility will be equipped with one centrifugal electric pump and one back-up diesel driven fire pump to draw water from the raw water tank to supply an underground fire water header, if it

is determined that the City of Mankato's water supply system will not be able to supply adequate flow. The header will supply water to yard hydrants and installed sprinkler deluge systems. A jockey pump will maintain water pressure in the firewater distribution header. If sufficient flow and pressure exists, firewater may also be taken directly from the City of Mankato's municipal water system.

The combustion turbine enclosures will be equipped with a carbon dioxide fire suppression system. The low sulfur distillate fuel oil tank will be equipped with a foam suppression system. The low sulfur distillate fuel oil unloading station will be equipped with foam nozzle and hose stations for use in fire-fighting activities.

A 290-horsepower diesel engine-driven firewater pump will only be operated in the event of a fire and loss of power to the electric motor-driven firewater pump. The firewater pump will be equipped with a 300-gallon capacity diesel fuel tank. Secondary containment will be provided for the diesel fuel tank. The diesel engine-driven firewater pump has a maximum heat input capacity of 2.0 MMBtu/hr and will operate no more than 300 hours per year.

2.7 ENVIRONMENTAL ISSUES

As required by recent changes to the Environmental Quality Board ("EQB") rules (Minn. R. 4410.7010 - 4410.7070), Mankato Energy is submitting the Site Permit Application to the EQB separately. The proposed Project qualifies for the shorter alternative permitting process (large electric power generating plants that are fueled by natural gas), which does not require the applicant to identify an alternative site. The Site Permit Application includes a review of potential human and environmental impacts associated with construction and operation of the Facility at the proposed site and lists environmental permits and approvals required from various federal, state, and local governmental agencies. Based on the information included in the Site Permit Application, the Facility is not expected to cause any significant human or environmental effects.

Recent amendments to environmental review rules addressing the matter of environmental review at the Certificate of Need stage before the MPUC for proposed large electric power generating plants require that the EQB prepare an environmental report (Minnesota Rules parts 4410.7010 to 4410.7070). The new rules also allows the MPUC and EQB to consolidate the Certificate of Need and site permitting proceedings if it is agreed upon by both parties that consolidation is feasible, more efficient, and may further the public interest. Furthermore, the proposed rules also recognize that in the event the applicant for a Certificate of Need also applies to the EQB at the same time for a site permit for a specific site and the project qualifies for the alternative review under rules 4400.2000, the EQB may elect to prepare an environmental assessment in lieu of the environmental report required under parts 4410.7010 to 4410.7070.

Mankato Energy is submitting the Certificate of Need and site permit applications concurrently and requests that the two proceedings be combined and that one environmental review document be prepared by the EQB. Mankato Energy will furnish any additional environmental information requested by the EQB in preparing the environmental assessment for the Project.

2.8 ENERGY COST INFORMATION

A confidential presentation of the Project costs are presented in Table 2-4 located in Appendix B in the format requested by Minn. R. 7849.0250. Mankato Energy will be marketing electric energy in the wholesale energy markets and will be negotiating power purchase agreements. As such this information represents must be kept confidential is it contains business sensitive information.

Mankato Energy has estimated costs using both internal experience and industry standards. For comparison purposes a service life of 30 years has been assumed to estimate annualized capital costs. The relative costs of the alternatives compared to one another are consistent in the two analyses.

The wholesale electric market will dictate the actual price that Mankato Energy obtains from the sale of that portion of the Facility that is the subject of this Application. In any event, because the portion of the Facility that is the subject of this Application is being built by a private company using private funds, the Minnesota public will not bear undue costs for the Project.

3.0 Capacity and Energy Needs

3.1 INTRODUCTION

The Mankato Energy Center will have a nominal generating capacity 730 MW at winter ambient conditions (655 MW of power at summer ambient conditions) using natural gas-fired combustion turbines in a combined cycle configuration. Mankato Energy has committed to supply up to 375 MW[7] of power to Xcel Energy after being selected in the bidding process approved by the Minnesota Public Utility Commission (MPUC) in its acceptance of Xcel Energy's resource planning process. See Docket E-002/RP-00-787. An electric power plant selected in a bidding process approved by the MPUC is exempt from Certificate of Need proceedings (Minn. Stat. §§ 216B.[243]; 216B.2422, subd. 5(c)). This was confirmed in the Exemption Order issued by the MPUC following its public hearing on January 22, 2003.

The balance of power generated at the Facility that is not statutorily exempt from the Certificate of Need process, which is 355 MW based on winter ambient conditions and 325 MW based on the maximum generating capacity of the Facility under summer ambient conditions, will be offered for sale to wholesale customers, including Minnesota utilities and cooperatives that project a need for such capacity and energy. For purposes of this Application, only this additional generation amount will be addressed.

As Mankato Energy does not control any "systems"[8] that purchase power in the wholesale market, it is necessary to demonstrate the need for the generation attributable to that portion of the Facility that is not statutorily exempt from the Certificate of Need process by documenting

[7] The PPA states that Mankato Energy will supply Xcel Energy with the lesser of (i) 375 MW or (ii) the net generating capability of the Facility as determined by the most recent capacity test.

[8] Definition of System: Minnesota Rules 7849.0010, Subp. 29 defines "system" as " the service area where the utility's ultimate customers are located and that combination of generating, transmission, and distribution facilities that make up the operating physical plant of the utility, whether owned or non-owned, for the delivery of electrical energy to ultimate customers."

the needs of those systems based on publicly available documents. Mankato Energy has evaluated the need for additional generating capacity using information from the following documents:

- North American Reliability Council (NERC), December 2003, *Reliability Assessment 2003 – 2012- The Reliability of Bulk Electric Systems in North America*;
- NERC, November 2003, *2003/2004 Winter Assessment – Reliability of the Bulk Electricity Supply in North America;*
- Mid- Continent Area Power Pool (MAPP)[9]. Final Form on July 1, 2003, *Load and Capability Report;* and
- Minnesota Department of Commerce, 2001, *Minnesota Energy Planning Report 2001.*
- Minnesota Department of Commerce, 2000, *Energy Policy & Conservation Report 2000.*

The MAPP region includes the states of Iowa, Minnesota, Nebraska, North Dakota, most of South Dakota, and portions of Illinois, Michigan and Montana. The Canadian provinces of Manitoba and Saskatchewan are included in the MAPP region as well. Appendix C contains copies of the pertinent portions of the MAPP reports.

3.2 PROJECTED CAPACITY NEEDS

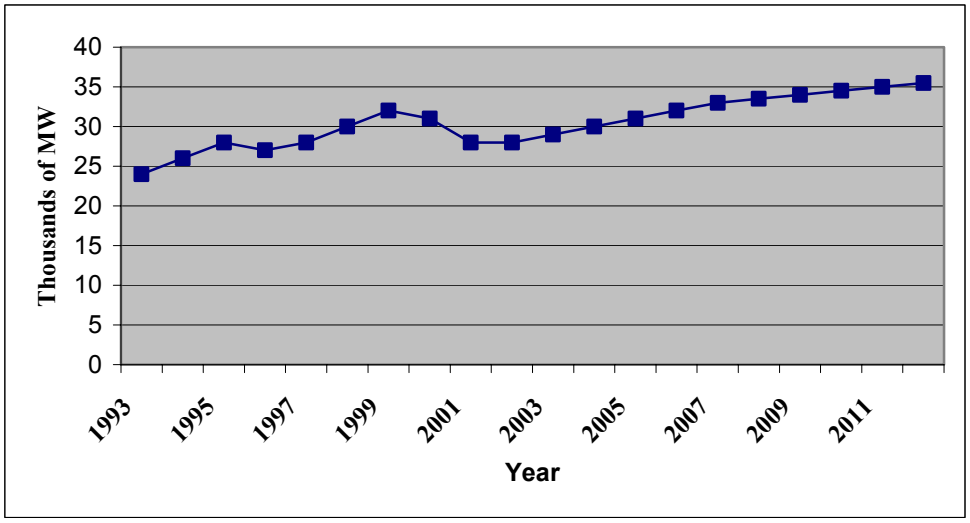
3.2.1 Demand Growth

In the Regional Self Assessment that is part of the NERC 2003-2012 Reliability Assessment (page 63), MAPP predicted that MAPP-U.S. summer peak demand will increase at an average rate of 1.8 percent per year during the 2003–2012 period. This is consistent with local Minnesota energy usage, which is expected to increase at an annual average rate of 1.9 percent through

[9] MAPP is a voluntary association of electric utilities doing business in the Upper Midwest. The MAPP organization performs three core functions: (1) it is a reliability council responsible for the safety and reliability of the bulk electric system under NERC, including system-wide planning functions; (2) it is a regional transmission group responsible for facilitating open access of the transmission system; and (3) it is a power and energy market where MAPP Members and non-members may buy and sell electricity.

2010 (2001 Minnesota Energy Planning Report, Page 27). Table 3-1 (based on data provided in 2003-2012 NERC Reliability Assessment, page 24) documents the historical and forecasted demand growth for the MAPP region.

Table 3-1
MAPP-US Historical Load and Demand Forecast Summer Data



The MAPP region, and more specifically Minnesota, will need additional electric generating capacity to meet growing electricity demands. As stated in the Minnesota 2000 Energy Policy Conservation Report, page 18:

> … "There is not excess generating capacity available to meet this increasing demand. Thus, in the near future significant new generation will be necessary to serve the electric needs of the state and region…"

The Minnesota 2001 Energy Planning Report (Report) it reiterates, that despite the sagging economy, additional sources of generation will be necessary to balance the electric supply and demand in the future (page 26). The Report notes that while Minnesota showed a capacity surplus in 2001, a deficit beginning in 2006 is also predicted (Page 27). The deficit that is predicted to begin in 2006 was estimated at 653 MW. The addition of the incremental portion of

the Mankato Energy Center coming online in 2006/2007 would serve to meet a portion of this predicted capacity deficit.

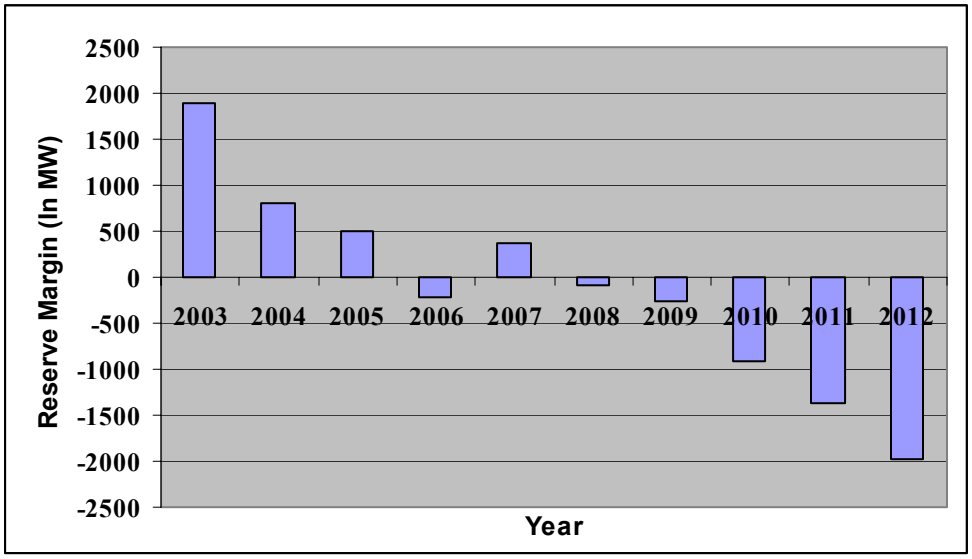
The NERC Reliability Assessment concurred with this prediction when it noted, "current planned capacity reported in the MAPP-U.S. region is below MAPP requirements for reserve capacity obligation during 2006-2012." (NERC Reliability Assessment, page 63). Assuming that all announced merchant generation is constructed and brought online, the MAPP projects an aggregate summertime deficit starting in 2009 for the MAPP-U.S. region (NERC Reliability Assessment, page 24). The addition of the incremental portion of the Mankato Energy Center coming online in 2006/2007 would serve to reduce the probability of such a summertime deficit.

It should be noted that although MAPP Canada is predicting excess capacity, issues relating to the transmission of that power across country boundaries limit its availability for use in the United States. The possibility of building new transmission lines to alleviate this constraint is unlikely. As noted on page 30 of the 2001 Minnesota Energy Planning Report, "transmission lines are notoriously hard to site."

3.2.2 Reductions in Reserve Capacity Margin

MAPP requires member systems to maintain reserve margins at or above 15 percent, which is equivalent to a 13.04 percent minimum capacity margin requirement. The summer capacity reserve margin is forecast to decline from a high of 17.9 percent in 2003 to 12.7 percent in 2006 and to 8.6 percent in 2012 (Page 63 of the NERC Reliability Assessment). Table 3-2 shows the projected reserve margins for the summer season for 2003 through 2011. To avoid the situation where reserve margins are inadequate, MAPP has indicated that they expect its members to add new capacity to avoid the assessment of financial penalties for non-compliance of their reserve capacity margins (Page 63 of the NERC Reliability Assessment). If there is not new capacity added to the MAPP system as MAPP reserve margins shrink, reliability of the electric supply will be impaired and energy costs will likely increase. The Mankato Energy Center will provide additional capacity to the MAPP-U.S. region to decrease the likelihood of this situation and assist in maintaining low energy costs.

Table 3-2
MAPP Summer Season Reserve Margins



3.2.3 Capacity Import

There is a projected net capacity import into the MAPP Region during the winter season. As indicated in the 2003/2004 NERC Winter Assessment it is projected that there will be 2,916 MW of firm purchases planned between MAPP members and from entities outside the MAPP region. There are 1,345 MW of firm sales planned between MAPP members and entities outside the MAPP region for the same period. This results in a projected net import of 1,571 MW. This is consistent with winter season projections through 2012 (MAPP Load and Capability Report) which projects the necessity to import capacity during each year's winter season.

The incremental generating capacity available from the Mankato Energy Center will help reduce the amount of power it is necessary to import into the MAPP region thus making the MAPP region more self-sufficient.

3.3 OTHER CAPACITY ISSUES

Although the North American transmission systems are expected to perform reliably in the near term, as customer demand increases and transmission systems experience increased power transfers, portions of these systems are reaching their reliability limits. This is the case within the MAPP region. The 2003/2004 NERC Winter Assessment (Page 23) indicates that MAPP reliability coordinators continue to monitor the 18 transmission constraints with the region that can limit MAPP imports and exports. The NERC Reliability Report further indicates (page 35) that one way to relieve transmission constraints and congestion is to locate new generation close to the demand center. As it is proposed to be located within 90 miles of the Minneapolis/St. Paul demand center, Mankato Energy fulfills this criterion. Additionally, the Facility is strategically located along a major transmission line that runs southwest to northeast and into the Twin Cities area. This will provide additional resources relatively close to the load center and potentially relieve congestion within the Minnesota electric grid.

Mankato Energy will be capable of providing low cost electricity within the MAPP-U.S. region (specifically, in Minnesota) at all times, including during those times when it is necessary to import power from outside the region. During times when there are bottlenecks in the transmission grid it is not possible to import lower cost power from outside. The region has had to rely on higher priced power within the region during those times. As noted in Section 5, Mankato Energy will be a low cost alternative and could have the potential to reduce costs (or, at a minimum least help maintain costs at current levels) to electricity ratepayers.

4.0 Additional Considerations

4.1 SOCIAL BENEFITS

The Facility will benefit the local and regional communities as well as the State of Minnesota. Development of the Facility began at the invitation of bidders by Xcel Energy to enhance their power supply portfolio in meeting the growing demand for electricity. The Facility utilizes natural gas, a clean-burning fossil fuel, and a highly efficient combustion technology to generate reliable electricity while minimizing human and environmental impacts. The Facility has been carefully sited close to a major natural gas pipe and the high voltage electric transmission system minimizing impacts associated with infrastructure connections.

The Facility will provide many benefits to the local community including economic benefits resulting from the construction and operation of the Facility and through the purchase of local goods and services. Some of the economic benefits include the following:

- Construction of the Facility is estimated to cost approximately $150 million. A significant portion of the monies spent on construction will be directed to in-state companies. In addition, Mankato Energy will employ as many as 450 construction workers at peak construction periods. It is anticipated that workers commuting to the site from the three-county area (Blue Earth, Nicollet, and Le Sueur) will fill most of the construction job needs. These jobs (including welders, pipefitters, iron workers, millwrights, carpenters, electricians, and other trades) will benefit the local economy during the construction phase resulting in approximately $50 million in local expenditures during the approximately 20-month construction phase of the Facility. Once in operation, the Facility will employ approximately 22 full-time workers, all of whom will become (if not already) residents of the local community, with well-paying jobs.

- A number of indirect and induced jobs will also be created. The direct effects of construction are noted above. The indirect effects occur as the recipient of the direct expenditures makes purchases or hires employees to meet the demands of the direct expenditures. An example of an indirect expenditure would be the income received by the maker of bags used to hold cement that is sold to the Project. The induced effects occur when workers spend their salaries on goods and services outside of the sphere of construction. An example of an induced expenditure would be income received by a local grocery store when an employee shops for food. Typical multiples used to determine the indirect and induced jobs range from 50 to 100 percent of the direct jobs during construction and from 200 to 300 percent of the direct jobs during the operation phase.

- The State of Minnesota and Blue Earth County will receive sales and income tax revenue from the construction of the project as well as income taxes from permanent full-time employees once the Facility is operating.

- The Facility is anticipated to have a useful life of at least 30 years. Mankato Energy estimates that approximately $9 million in direct, indirect and induced regional annual sales will result from operation of the Facility in the Blue Earth, Nicollet, and Le Sueur-county area.

- Mankato Energy intends to be an active member of the local community, participating in charitable events, community service organizations, and outreach programs.

The addition of the Facility to the existing utility electric grid system will also have positive impacts for Minnesota in terms of both generation and transmission benefits. The Minneapolis/St. Paul metro area is a large load pocket located north of the Facility. For this reason, excess power that does not flow through the nearby Wilmarth Substation transformers to serve local load will most likely flow from Mankato in a northerly direction toward this large load area. Adding the Facility, which will be a large, efficient, and low cost generator, in an area of Minnesota that does not have such a generator at this time will benefit the stability of the

system in that it will provide local voltage support. The location of the Facility will also increase the geographic diversity of Minnesota's electric generation. Further, by being able to more closely follow the ebbs and flows of the wind generating units in southwest Minnesota, particularly in the Buffalo Ridge area, the Facility will provide additional system reliability.

4.2 EFFECTS OF THE FACILITY IN INDUCING FUTURE DEVELOPMENT

Although the Facility is not expected to have much a significant impact on the immediate area in terms of generating future development, increasing the supply of efficient electrical power will enable the region and state to meet future energy needs and help sustain economic growth associated with additional industrial, commercial, and residential development.

5.0 Alternatives to the Proposed Project

5.1 OBJECTIVES USED TO EVALUATE ALTERNATIVES

The overall objective in this alternatives analysis is to determine the compatibility of other means of satisfying an energy need that (i) fits within the boundaries of the site selected by Calpine Corporation ("Calpine") of which Mankato Energy is a subsidiary for the statutorily exempt portion of the Facility, (ii) comports with the business model of Calpine, (iii) is cost-effective when compared to the portion of the Facility that is the subject of this Application, and (iv) is commercially proven.

The objective of locating the generating capacity that is the subject of this Application on the same site of the statutorily exempt generating capacity is based on a desire to achieve operational efficiencies, and to conserve resources (time, money, land, water, etc.). Were the Facility to be sited in another location, opportunities for operational efficiencies would be lost and resources would be, to a certain degree, wasted.

The objective of selecting a project that comports with the business model of Calpine is geared primarily toward the selection of the mode of generation. Calpine is the leading producer of combined-cycle natural gas fired electric generation in the U.S. It is also the world's largest generator of geothermal power. Calpine has never developed, constructed, or operated a coal power plant, an oil-fired power plant (except those power plants that use low sulfur oil as a back-up fuel), or wind or solar facilities. Further, Calpine has not advocated, organized, or otherwise promoted customer-owned distributed generation or demand side management.

The objective of developing and operating generating sources that are cost-effective and use proven technology is more important to an independent energy producer like Calpine than it might be to a utility or municipal entity. Such entities may be statutorily required to diversify

their generating portfolios into promising directions that might not currently be cost-effective without subsidies or that might not yet be proven on a large-scale. Calpine, on the other hand, is required by its corporate mandate and shareholder desires to look more to the present state of available alternatives in determining the technology that will be employed at any particular generating facility. Having stated this mandate, it is also true that Calpine is continuously reviewing its business model in a manner that is similar to the alternatives analysis set forth below with the expectation that one or more of the technologies discussed may be the economically and environmentally preferred technology of choice in the future. Additionally, Calpine does not have access to ratepayer funds that could provide a resource for retirement of capital investments, nor is Calpine able to pass through fuel costs to its customers – these costs must be borne by Calpine and its shareholders. This dynamic requires Calpine to exercise diligence in deciding where and when to pursue opportunities for capital investment in new power generating facilities.

The objective of commercial feasibility is an important consideration in selling the generated power to wholesale customers. Without a guaranty of long-term reliability and cost-effectiveness, it is difficult or impossible to convince customers that an unproven technology should be selected for purchase. Calpine cannot make such guaranties.

5.2 ALTERNATIVES CONSIDERED

On November 25, 2003, Calpine filed a Request for Exemption from Certain Data Filing Requirements and Order Establishing Scope of Application ("Exemption Request") with the MPUC. In summary, Calpine requested that the MPUC grant it certain Certificate of Need data exemptions, pursuant to Minn. R. 7849.0200, subp. 6, that are not necessary to determine the need for an independent power production facility. The MPUC granted Calpine's request in its order dated February 6, 2004, *In the Matter of the Application of Calpine Corporation for a Certificate of Need for a Large Electric Generating Facility*, Order Granting Exemptions from Filing Requirements and Limiting Scope ("Exemption Order"). The Exemption Order

completely waived the need to discuss some of the data requirements and modified the topics or breadth of discussion with respect to other data requirements. The content of the Exemption Order is noted in the appropriate sections below as well as Section 1 of this Application.

5.2.1 Siting Alternatives

Calpine Corporation specializes in the development, construction, and operation of combined cycle natural gas-fired facilities. One part of that specialization consists of identifying areas within the United States that have energy needs. In some instances, this decision is made quite simple when a local utility puts out a request for power supply proposals. This was the case with the exempt portion of the Facility. Calpine was selected to negotiate an agreement with Xcel Energy for the output of a certain portion of the Facility and is currently soliciting other nearby utilities for power sales for the remaining portion. In other instances, the search is geared toward identifying areas that have a need for energy and one or more utilities or other load serving entities that are receptive to contracting long-term for the purchase of electric power.

Calpine identified the MAPP region as a location where additional energy supplies were needed. The energy needs in the MAPP region were described in detail in Section 3. The MPUC agreed with the need for more energy sources in the region, specifically in Minnesota, when it approved the resource planning process proposed by Xcel Energy in Docket E-002/RP-00-787, *In the Mater of Northern States Power Company's Application for Approval of its 2000-2014 Resource Plan*, Order Approving Xcel Energy's 2000-2014 Resource Plan.

Another part of the specialization centers on the site selection process within the larger geographic region in which the power need was identified. Once the greater geographic area with a need for energy was identified, Calpine sought to find a specific location within that geographic region in which to develop a power generating project. Initial screening criteria used in determining the power plant location included the following:

- Proximity to major electric transmission infrastructure, including adequately sized transmission lines and substations.

- Proximity to adequately sized high-pressure natural gas pipeline(s).
- Proximity to water supply (surface, ground, or nearby water treatment facilities with adequate supplies of gray water).
- Avoidance of environmentally sensitive areas.

In some instances, Calpine considered and rejected certain sites because they did not meet the initial screening characteristics described above. In other instances, alternative sites were rejected because the advantages offered by the sites located in Mankato were far superior to those alternatives in other parts of Minnesota. Specific considerations made in this regard include the following characteristics. They indicate how the selected site location is appropriate for development and will minimize environmental impacts.

- Avoidance or minimization of impacts on threatened or endangered species.
- Avoidance of culturally and historically significant resources
- Avoidance of residential areas, airports, schools, hospitals, campgrounds, parks, and tourist attractions.
- Land availability and landowner agreement.
- Topography.
- Proximity to existing rights-of-way (e.g., railroad easements, roadway shoulders, transmission line rights-of-way, gas pipeline rights-of-way, bike paths, etc.) for offsite laterals so as to avoid new impacts.
- Favorable construction conditions, i.e., adequate land access, avoidance of existing utilities, and minimization of earthwork activities.
- Consultation with the Minnesota Environmental Quality Board.
- Consultation with the Minnesota Department of Natural Resources.
- Consultation with the Minnesota Pollution Control Agency.
- Consultation with Blue Earth County planning officials.
- Consultation with City of Mankato officials.

After consideration of these more refined criteria, the site ultimately selected in Mankato, Minnesota was determined to be the most suitable location for the Facility.

5.2.2 Purchased Power Alternative

As noted in the Exemption Request, Mankato Energy is not a regulated utility, thus it does not purchase power. Indeed, Mankato is in the business of selling power to such entities as Xcel Energy and other wholesale customers. As such, this data requirement is not applicable to the Facility. Because this requirement does not apply to independent entities such as Mankato Energy, or to power plants such as the Facility, the MPUC agreed to waive this data requirement in its Exemption Order provided that certain other alternatives were discussed. Those other alternatives are discussed later in this section.

5.2.3 Alternative of Performing Upgrades to Existing Resources

As noted in the Exemption Request, neither Mankato Energy nor Calpine have existing facilities or resources in Minnesota at which it might seek to improve the operating efficiency. The type of power plant facility Mankato Energy intends to build will use the most efficient type of generating technology for large-scale power generation that is available today. It will be much more efficient and much more environmentally friendly than traditional fossil fuel technologies, such as coal, oil, or gas-fired steam boiler technology. The fact that the Facility will not require the construction of lengthy transmission lines off-site makes any discussion of efficiency improvements to the Facility's interconnecting transmission lines inapplicable. Moreover, neither Mankato Energy nor Calpine owns or operates transmission lines within the service area at which the Facility will be located or anywhere else in Minnesota at which it might seek to improve the operating efficiency.

Because this requirement does not apply to independent entities such as Mankato Energy, the MPUC agreed to waive this data requirement in its Exemption Order provided that certain other alternatives were discussed. Those other alternatives are discussed later in this section.

5.2.4 New Transmission Alternative

With respect to new transmission, Mankato Energy pointed out in the Exemption Request that the development, construction, and operation of transmission and distribution lines is best left to regulated utilities with defined service obligations to retail consumers. Mankato Energy is neither qualified nor willing to enter into the business of transmission line operation or ownership.

Because this requirement does not apply to independent entities such as Mankato Energy, the MPUC agreed to waive this data requirement in its Exemption Order provided that certain other alternatives were discussed. Those other alternatives are discussed below.

While it is generally exempt from the discussion of new transmission, Mankato Energy points out that the potential impacts resulting from the Facility on the transmission system in Minnesota should not be negative. In fact, it is likely that the Facility could actually have the effect of improving certain aspects of the existing system vis-à-vis new wind generating resources in the southwest region of the state. A general discussion follows later in this section.

5.2.5 Minnesota Transmission

The transmission system in the MAPP region, which encompasses Minnesota, North Dakota, Iowa, Nebraska, most of South Dakota, and parts of Montana, Wisconsin, and Canada, is constrained in terms of both importing power and exporting power. Because Mankato Energy is proposing to construct the Facility in Minnesota, neither interstate constraint applies in this particular case. An analysis of the potential impacts resulting from the Facility on the transmission system in Minnesota is provided in the remainder of this section.

5.2.5.1 Transmission Summary

Mankato Energy performed an internal analysis to determine the amount of electric power generation that could be added to the Xcel Energy Wilmarth Substation in Mankato, Minnesota without degrading or adversely impacting the transmission system. The results of the analysis showed a generating plant capable of producing an average of 500 to 550 MW could be

constructed with little to no transmission upgrades. In fact, the addition of Facility to the existing utility electric grid system will have positive impacts for Minnesota in both generation and transmission benefits.

5.2.5.2 Transmission Analysis

The existing power plants in the Mankato area are relatively small ranging from 11 MW to approximately 100 MW. An exception is the Lakefield Junction Peaking Station, which has a capability to produce 534 MW. Peaking stations are useful in that they can ramp up to full power output from an extended period of downtime very quickly. On the negative side, peaking stations are relatively inefficient, especially when compared to a combined cycle power plant such as the Facility are proposed. These facts lead to operating modes where the peaking facility will only run a few hours each year when electric demand is the highest.

In Calpine's internal analysis using the MAPP 2005 summer peak case from the FERC website, it modeled Lakefield Junction at 440 MW to obtain results based on a realistic scenario. The results of the analysis in that situation indicate that the Mankato Energy Center could dispatch or supply power into the Minnesota electric grid without adverse impacts to the transmission system. In most power demand scenarios, the Mankato Energy Center generation will displace the higher cost Lakefield Junction generation based on economic dispatch of the two plants, i.e., plants with lower energy costs are dispatched before plants with higher energy costs.

The Minneapolis/St. Paul area is a large load pocket located north of the Facility. For this reason, excess power that does not flow through the Wilmarth substation transformers to serve local load will most likely flow from Mankato in a northerly direction toward this large load area. Adding the Facility, which will be a large, efficient, and low cost generator, in an area of Minnesota that does not have such a generator at this time will benefit the stability of the system in that it will provide local voltage support. The location of the Facility will also increase the geographic diversity of Minnesota's electric generation. Further by being able to more closely follow the ebbs and flows of the wind generating units in southwest Minnesota, particularly the Buffalo Ridge area, the Facility will provide additional system reliability.

The Midwest ISO 2007 Transmission Expansion Plan (MISO) has determined the Buffalo Ridge area as favorable for transmission construction and has outlined possible construction projects. In fact, just recently, four different transmission improvement projects were approved by the MPUC. The most significant of these is the 345-kilo Volt transmission line from South Rock to Lakefield Junction. The MISO proposals for additional transmission lines in the Buffalo Ridge area, which is south and west of Mankato, will strengthen the Minnesota transmission system while at the same time providing a clear path for the wind power in the Buffalo Ridge area to get to load centers. Because, generally speaking, wind power energy costs are less than the energy costs associated with a combined cycle facility (wind is free; gas costs money), any wind-generated power flowing from the Buffalo Ridge area through Lakefield Junction toward the Twin Cities will be run whenever it is available. The Facility, as a combined cycle power plant, would be able to follow the load swings much better than a coal or nuclear plant, thus helping to maintain the reliability of a system that may become increasingly dependent on wind generation.

In summary, the addition of Mankato Energy Center will have positive impacts for Minnesota in both generation and transmission benefits.

5.2.6 No Facility Alternative

As previously noted, the MPUC approved the resource planning process proposed by Xcel Energy in Docket E-002/RP-00-787, *In the Mater of Northern States Power Company's Application for Approval of its 2000-2014 Resource Plan*, Order Approving Xcel Energy's 2000-2014 Resource Plan. A part of that approved process included a solicitation of proposals to increase its supply portfolio by 1,000 MW. To meet this objective, on December 6, 2001 NSP Xcel Energy issued a Request for Supply Proposals with Power Deliveries Beginning 2005-2009 ("RFP"). Calpine responded to the RFP on March 14, 2002 with a bid of approximately 280 MW baseload capacity (based on winter ambient conditions) and approximately 360 MW in initial peaking capacity (based on winter ambient conditions) with step increases in the peaking portion of the proposal of approximately 180 MW in the latter years of the timeframe set by Xcel Energy in the RFP.

On June 19, 2003, Calpine was notified that it had been selected by Xcel Energy for negotiation of a purchased power agreement ("PPA"). The negotiations, which are expected to be completed in the very near future, contemplate the sale by Calpine and purchase by Xcel Energy of up to 280 MW baseload capacity (based on winter ambient conditions) and 85 MW of peaking capacity (year round availability). The baseload capacity will be generated by a natural gas fired combined cycle power plant. The peaking capacity will be generated by supplementally firing the duct burners associated with the same source. The portion of the power plant that will supply this electric energy is statutorily exempt from the Certificate of Need process pursuant to Minn. Stat. §§ 216B.243; 216B.2422, subd. 5(c).

In order to achieve certain construction and operational efficiencies, conserve resources (land, water, labor, materials, etc.), and meet the expected energy growth needs in Minnesota in a timely manner, Calpine has proposed to configure the Facility larger than would be required solely to satisfy its obligations under the PPA. It is contemplated that the power supply obligations under the PPA will be met with a power plant configured with one combustion turbine generator, one heat recovery steam generator, one steam turbine generator, one condenser, one multi-cell cooling tower, and certain other appurtenant pieces of machinery and equipment that are required for a safe and efficient operating power plant in the configuration described. Calpine has proposed to add one additional combustion turbine generator and one additional heat recovery steam generator to the Facility. The same steam turbine generator, condenser, cooling tower, and appurtenant machinery and equipment used for the supply of Commission-approved power will be used to supply the additional power that is intended for sale to wholesale customers.[10]

If Mankato Energy were only to build the 1x1 configuration, the efficiencies of building out the other portion of the power plant would be lost, and the energy needs of the area that were described in Section 3.0 would have to be met with other generation. Such additional generation is likely to cost more due to the fact that the incremental cost to construct a larger facility at

[10] Certain exceptions to this general statement are noted in other sections of this Application. These exceptions include five additional cells on the cooling tower, slightly larger water supply and discharge pipelines, and a slightly larger natural gas lateral pipeline.

Mankato Energy Center is lower than would be the case at another Greenfield site. This is because much of the infrastructure needed for a new facility is already in place. Further, these other generating sources may not be as environmentally benign as the proposed Facility or as economical to operate.

5.2.7 Coal Alternative

Calpine has never developed, constructed, owned, or operated a coal-fired power generating facility, and the company has no plans to develop such a facility.

In addition, the relatively small size of the Facility site effectively precludes the use of coal technology due to the need for large areas devoted to coal handling and storage facilities. Combined cycle facilities are designed to accommodate small parcels of land and minimize total land use requirements – an advantage that would be lost with the use of coal-fired generating technology.

Finally, as a general matter, siting and permitting a coal plant in Minnesota would be much more difficult than siting and permitting a natural gas plant due to environmental concerns regarding significantly higher sulfur dioxide, particulate, and mercury emissions, as well as noise and other impacts associated with the coal delivery and handling facilities (including rail traffic to bring the coal to the plant), and potential cost implications that may arise from future environmental regulations such as carbon dioxide monetization.

5.2.8 Oil-Fired Combustion Turbine Alternative

The Facility will be capable of using low sulfur distillate oil as a back-up fuel. The use of the distillate oil will be restricted to ten percent of the Facility's operating hours based on an annual rolling average. The incorporation of distillate oil capability increases the operating flexibility of the Facility in that restrictions or interruptions of natural gas supplies may be mitigated by switching fuel sources. Limiting the fuel source(s) for the Facility to only distillate oil would reduce this operating flexibility.

Further, the environmental impacts associated with an oil-fired combustion turbine would be significantly greater than the impacts associated with the proposed Facility. For example, emissions of sulfur dioxide, carbon monoxide, nitrogen oxides, and particulate matter would all be greater. Water use would also be greater, and land use requirements also would be greater due to the need for large quantities of on-site oil storage capacity needed to support continuous operation.

Finally, the cost of operating an oil-fired facility is greater than operating a natural gas-fired facility in terms of both fuel costs and operating and maintenance costs.

5.2.9 Simple-Cycle Combustion Turbine Alternative

The Facility will use combined-cycle technology. The decision to use combined-cycle technology rather than simple-cycle technology stemmed from the initial solicitation for power resources issued by Xcel Energy. That solicitation requested both base/intermediate load and peaking capacity. The combined-cycle plant better satisfied the base/intermediate load portion of the solicitation. The ability to supplementally fire duct burners located in the HRSG is the method that will be used to meet a part of the peaking needs of Xcel Energy. By firing duct burners located in the HRSG, the Facility is able to produce more electric power than if the duct burners were not installed. In effect, this configuration allows for a power plant that is capable of producing clean and efficient electric power to meet varying electrical demand types.

The same concept of flexibility that is part of that portion of the Facility dedicated to Xcel Energy is also present in the other portion of the Facility that is the subject of this Application.

A significant advantage that a combined cycle facility has over a simple cycle facility is greater efficiency. The heat rate, the industry measure of efficiency, is the heat (Btu's) required to generate 1 kWh of electricity. Typically, the heat rate of a simple-cycle facility is about 11,000 Btu/kWh (HHV) while the heat rate associated with the combined-cycle portion of the Facility is about 7,000 Btu/kWh (HHV). Even the heat rate associated with the supplementally oil fired portion of the proposed Facility is about 10,200 Btu/kWh (HHV), which compares favorably

with the heat rate of the simple cycle plant. The loss of efficiency from combined to simple cycle means more fuel use for the same amount of electric power, more emissions per the amount of power produced, and a higher cost of power.

5.2.10 Alternative of Customer-Owned Distributed Generation

Mankato Energy is not in the business of advocating, organizing, or otherwise promoting customer-owned distributed generation, and it is not in Calpine's corporate mandate to do so now. Further, substitution of distributed generation for the Project would require acquisition of many sites throughout Minnesota to generate the same amount of power as will be generated from the Facility. It is not practical for Calpine to place distributed generation in enough sites to displace the amount of power proposed to be generated by that portion of the Facility that is the subject of this Application.

Moreover, the cost of using distributed generation to replace the capacity that is the subject of this Application would be greatly more expensive than Mankato Energy's proposal both in terms of capital costs (dollars per MW, including site infrastructure) and operating costs (Btu/kWh).

Finally, the environmental impacts associated with distributed generation assuming fossil fuel based power, are greater than the impacts potentially associated with the Facility. This is due to the fact that the small size of the distributed generation facilities allows them to escape more stringent air emission requirements associated with a larger facility.

5.2.11 Demand Side Management Alternative

Mankato Energy is not in the business of advocating, organizing, or otherwise promoting demand side management; neither is it in Calpine's corporate mandate to do so now. Encouragement of demand side management is better left to utilities, other load serving entities, and regulatory incentives or restrictions. The MPUC agreed in the Exemption Order that while regulated utilities have a duty to consider conservation when conducting their resource planning, different considerations apply in the wholesale context in which unregulated utilities such as

Calpine operate. Accordingly, the MPUC agreed to waive the requirement that this alternative be discussed.

5.2.12 Renewable Alternatives

Mankato Energy has never developed, constructed, owned, or operated renewable generating facilities, and Calpine's experience in this regard extends only to geothermal plants. It is not in Calpine's corporate mandate to develop other renewable technologies at this time. With respect to geothermal generation, the Facility site is not a good candidate for such generation due to the lack of appropriate geology and hydrology necessary to support such generation. As for other renewable generating technologies, further discussion is provided below. The following discussion are based on the fact that this particular site will be used to provide the Exempt portion of power.

5.2.12.1 Wind Power

The relatively small size of the Facility site effectively precludes the use of wind technology due to the need for large spaces between the windmills. The lack of space would preclude installation of any significant wind generating capacity at the site. In addition, despite recent improvements to increase the reliability and decrease the costs associated with wind power, these measures both fall short of the reliability and cost associated with the generation that is the subject of this Application.

5.2.12.2 Solar Power

The relatively small size of the Facility site effectively precludes the use of solar technology due to the need for large amounts of space for the solar panels. The lack of space would preclude installation of any significant solar generating capacity at the site. Further, the cost and reliability of solar power does not compare favorably with the generating capacity proposed in this Application. Also, northern latitudes do not provide the necessary amount and intensity of solar energy required to make solar generation a feasible option.

5.2.12.3 Hydropower

The difficulty of siting and permitting a hydropower plant along the Minnesota River of sufficient generating capacity to displace the capacity proposed in this Application precludes this alternative.

5.2.12.4 Biomass

The relatively small size of the Facility site would preclude siting a biomass plant that would have the same generating capacity as the proposal that is the subject of this Application. Further, a biomass plant would be more expensive to build and operate than the proposed generating capacity. Finally, the environmental impacts of such a facility would be greater (due to both the facility itself and the machinery and equipment needed to gather and transport the biomass fuel) than the proposed generating capacity.

5.2.13 Alternative of Emerging Technologies

While it continues to investigate emerging power generation technologies, Calpine believes that such approaches are not sufficiently mature at this time. In the past, Calpine has explored the potential of integrated coal gasification/combined cycle ("IGCC"), technology. While this emerging technology continues to hold interest for Calpine, the Facility site is too small to accommodate the fuel storage and handling facilities that would be needed for an IGCC facility. Also, the cost-effectiveness and reliability of this technology do not currently compare favorably with the technology that is the subject of this Application. Other emerging technologies considered as alternatives to the portion of the Facility that is the subject of this application are discussed below.

5.2.13.1 Fuel Cells

While there is a great deal of excitement and expectation for fuel cell technologies, the technology is not yet cost-effective compared to combined-cycle gas-fired combustion turbines. Further, the small size of the fuel cells that are currently commercially available make them a poor substitute for the large amount of generating capacity that is the subject of this Application.

5.2.13.2 Microturbines

Microturbines have only recently entered into commercial use. While experience to date shows that this technology may be nearly as cost-effective and efficient as natural gas-fired combined cycle technology like that proposed in this Application, the long term reliability and operations and maintenance issues have yet to be proven out. Further, the environmental impacts associated with microturbines are certain to be greater than the impacts potentially associated with the Facility. This is due to the fact that the small size of the microturbines could allow them to escape the more stringent air emission requirements associated with a larger facility.

5.2.13.3 Batteries

The high cost of battery technology and the limited experience of this alternative in utility-scale applications makes it a poor substitute for the large amount of generating capacity that is the subject of this Application. Accordingly, this technology was not considered to be a viable alternative to the generating capacity that is the subject of this Application.

5.2.13.4 Pumped Storage

The Facility site is not suited to a pumped storage application due to the need to store large amounts of water into an elevated reservoir. Accordingly, this technology was not considered to be a viable alternative to the generating capacity that is the subject of this Application.

5.2.13.5 Compressed Air

Highly specialized geological sites are needed to make use of compressed air technology. Such sites are scarce in Minnesota, and those that do exist are not located in the vicinity of the Facility site. This technology is not yet commercially proven; accordingly, it was not considered to be a viable alternative to the generating capacity that is the subject of this Application.

5.2.13.6 Superconducting Magnets

This technology, which makes use of coils that can store electric energy, is not yet commercially proven. Accordingly, this technology was not considered to be a viable alternative to the generating capacity that is the subject of this Application.

5.3 ECONOMIC COMPARISON

5.3.1 Alternatives Summary

Table 5-1 summarizes the conclusions reached in the above descriptions of the alternatives with respect to the Project objectives. Alternatives that will be subject to further economic screening are identified below. The section that follows contains the economic comparison.

TABLE 5-1
ALTERNATIVES COMPARISON

Alternatives Considered	Applicable to Mankato Energy Center	Meets Project Objectives/Meets Site Criteria	Considered in Further Economic Screening
Alternative Siting	Yes	No	No
Purchased Power	No	No	No
Upgrades to Existing Resources	No	No	No
New Transmission	No	No	No
No Facility	Yes	No	Yes/Qualitatively
Coal	No	No	No
Oil-Fired Turbine	Yes	Yes	Yes
Simple-Cycle Turbine	Yes	Yes	Yes
Customer-Owned Distributed Generation	No	No	No
Demand Side Management	No	No	No
Renewables	No	No	No
Emerging Technologies	No	No	No

5.3.2 Alternatives Economic Comparison

A confidential presentation of the Project cost comparison is presented in Table 5.2 located in Appendix B. This table provides the cost comparison between the Project and the alternatives meeting the initial screening criteria. These alternatives include oil fired combined-cycle combustion turbines and simple cycle combustion turbines. Although an economic analysis is not included in this Application for the "No Build Alternative", not building the portion of the Project addressed in this application would result in loss of efficiencies associated with the construction of the 2x1 configuration.

Table 5-2 demonstrates that the Project is the lowest-cost alternative based on the projected capacity factor of 50 percent and service life of 30 years for all three alternatives considered. A confidential presentation of proprietary costs for the proposed Facility and the considered alternatives is presented in Appendix B.

The Oil Combustion Alternative analysis is based on a combined-cycle configuration. The Simple Cycle Alternative analysis is based on the combustion of natural gas as the primary fuel. An oil-fired Simple Cycle alternative was not included in the analysis because it would be less cost-effective than the alternatives addressed above and therefore would not contribute to the alternatives analysis.

In conclusion, the portion of the Facility that is not subject to the statutory exemption from the Certificate of Need process pursuant to Minn. Stat. §§ 216B.243; 216B.2422, subd. 5(c) is the best alternative for meeting the energy needs of the local area in the near term. All other alternatives reviewed by Mankato Energy, including the no-build alternative, the alternative of using other conventional fuel sources, and the alternative of using renewable resources or emerging technologies, fall short in one or more categories.

6.0 Consequence of Delay

Mankato Energy requested an exemption from the data requirements contained in Minnesota Rules 7849.0300, which require that an application for a Certificate of Need must describe the anticipated consequences if a proposed facility is delayed. In its Exemption Order granted to Mankato Energy on February 6, 2004, the MPUC agreed to waive this data requirement provided that information on the consequences of delay to potential purchasers of the incremental electric capacity available from the Facility, and the region in general, were addressed. Mankato Energy has addressed these consequences in Section 3 of this application. In summary, the energy deficits that are predicted to occur in the near future would have to be addressed in another manner, i.e., without resort to obtaining power from the Facility, were construction of the Mankato Energy Center to be delayed. Delaying the Project would restrict and/or eliminate the environmental and economic benefits of the Project that have been identified throughout this application.

7.0 Permits and Approvals

In addition to applying for a Certificate of Need, Mankato Energy must apply for numerous federal, state, and local permits and approvals for construction and operation of the Facility. Anticipated permits and approvals are listed below in Table 7-1. Mankato Energy is or will pursue obtaining all necessary permits and approvals.

TABLE 7-1
REQUIRED PERMITS AND APPROVALS

Unit of Government*	Type of Approval	Regulated Activity	Status
Federal			
FAA	Notice of Proposed Stack Construction	Stack height greater than 200 feet above ground level	To be provided
U.S. EPA	Acid Rain Permit	Title IV Acid Rain Certificate of Representation for the discharge of sulfur oxides	To be obtained
	Risk Management Plan/Process Safety Management (RMP/PSM)	Risk management plan is required for facilities possessing more than threshold quantities of regulated chemicals (e.g., anhydrous ammonia)	To be developed
	Notice of Hazardous Waste Generation	Hazardous waste generation	To be provided if needed; anticipated to qualify as CESQG
USACOE	Section 404 Permit; GP/LOP-98-MN	Discharges of dredged or fill material within wetland areas associated with installation of cooling water discharge pipe and outfall structure; covered by General Permit (non-reporting)	No application required; confirm compliance with general permit terms and conditions prior to construction
	Section 10 Permit	Construction of outfall structure at the Minnesota River (a navigable water)	To be obtained
U.S. Fish & Wildlife Service	Threatened and Endangered Species Review	Review of agency records for federally threatened and endangered species that may exist at or near the site and may be affected by the project	Completed - Verbal comments received Sep-5-03

TABLE 7-1
REQUIRED PERMITS AND APPROVALS

Unit of Government	Type of Approval	Regulated Activity	Status
State of Minnesota			
PUC	Certificate of Need	Certification that electricity generated by the facility is needed	To be obtained; Request for exemption from certain data filing requirements and order establishing scope of application approved on Jan-22-04 (This document)
MAPP	Approval as a Network Resource for Xcel	Generator interconnection and transmission access	To be obtained
EQB	Power Plant Siting Permit	Review of potential human and environmental impacts associated with the siting of a large electric power generating plant. Qualifies for alternative review process for facilities fueled by natural gas	Pending - Permit application submitted February 2004
SHPO	Cultural Resources Review	Review of agency records for the presence of archeological, historical, or architectural resources at or near the site that may be affected by the project	Completed - Received comment letter dated Sep-9-03
MDNR	Minnesota Natural Heritage Database Review	Review of the Minnesota Natural Heritage Information System database for the presence of any rare plant communities or animal species, unique resources, or other significant natural features at or near the site that may be affected by the project	Completed - Received comment letter dated Sep-11-03
	Protected Waters Permit	Construction of outfall structure at the Minnesota River	To be obtained
MPCA	NPDES/SDS Discharge Permit	Discharge of cooling water and other low volume wastewater to the Minnesota River	To be obtained
	NPDES/SDS General Stormwater Discharge Permit (MN R100001) for Construction Activities	Stormwater discharges associated with construction activities disturbing one or more acres of land	To be obtained
	NPDES/SDS General Stormwater Discharge Permit (MN G611000) for Industrial Activities	Stormwater discharges associated with industrial activities at the Facility. Coverage under the permit requires preparation of a Stormwater Pollution Prevention Plan	To be obtained
	Air Emission Facility Permit (Combined Construction and Title V Operating)	Air emissions - permitting requirements associated with federal PSD new source review and NSPS requirements, and other applicable state/federal requirements	Pending - Permit application submitted Dec-3-03

TABLE 7-1
REQUIRED PERMITS AND APPROVALS

Unit of Government*	Type of Approval	Regulated Activity	Status
MPCA	Air Toxics Review	Air emissions risk analysis to evaluate potential health risks associated with burning low sulfur distillate oil as back-up fuel	Submitted to the MPCA, February 18, 2004. It is under review.
	Section 401 Water Quality Certification	Review and certification of construction activities affecting wetlands requiring a USACOE permit	To be obtained
	Hazardous Waste Generator License	Hazardous waste generation	To be obtained if needed
	Spill Prevention, Control and Countermeasure Plan	Aboveground storage of greater than 1,320 gallons of fuel oil; plan to be prepared and maintained at the facility	To be completed
	Oil and chemical storage requirements	Certain tank construction and installation requirements must be met; provisions and measures to prevent discharges will be incorporated in the design of the fuel oil storage tank	To be met
Local			
City of Mankato	Conditional Use Permit	Electric generating facility within areas zoned M-2, Heavy Industrial District	To be obtained
	Building Permit	Site grading, development, construction, and occupancy approval	To be obtained
	Minnesota Wetland Conservation Act Exemption	Exemption from wetland replacement associated with installation of cooling water discharge pipe through wetland areas	To be obtained
	Orderly Annexation	City of Mankato and Lime Township entered into Joint Resolution for Orderly Annexation whereby the City agreed to annex areas to be developed for industrial purposes.	To be obtained
	Other	*Applicable Permits/approvals for connections to municipal sewer and water as well and gray water from WWTP*	To be obtained if required
Other			
Utilities	Utility Connection Permits and Approvals	Installation of necessary utilities and related equipment (e.g., water, wastewater, gas pipelines, transmission lines, telecommunications)	Responsibility of Supplier Gas pipeline permits listed in separate pipeline route permit application submitted to the EQB

*Abbreviations:

EPA	United States Environmental Protection Agency
EQB	Minnesota Environmental Quality Board
FAA	Federal Aviation Administration
MAPP	Mid-Continent Area Power Pool
MDNR	Minnesota Department of Natural Resources
MPCA	Minnesota Pollution Control Agency
PUC	Minnesota Public Utilities Commission
SHPO	Minnesota State Historical Preservation Office
USACOE	United States Army Corps of Engineers
CESQG	Conditionally Exempt Small Quantity Generator

Appendix A

Exemption Order Materials

BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

LeRoy Koppendrayer	Chair
Marshall Johnson	Commissioner
Ken Nickolai	Commissioner
Phyllis A. Reha	Commissioner
Gregory Scott	Commissioner

In the Matter of the Application of Calpine Corporation for a Certificate of Need for a Large Electric Generating Facility

ISSUE DATE: February 6, 2004

DOCKET NO. IP-6345/CN-03-1884

ORDER GRANTING EXEMPTIONS FROM FILING REQUIREMENTS AND LIMITING SCOPE

PROCEDURAL HISTORY

On November 14, 2003, Calpine Corporation (Calpine) filed a petition stating that it intended to submit an application for a certificate of need to construct a natural-gas-fired combined cycle electric-generating facility at a site near Mankato. The petition requested exemptions from certain data requirements in the certificate of need rules,[1] claiming that the data in issue is not applicable to a generation project proposed by an independent power producer, not reasonably available to Calpine or not necessary to determine the need for the proposed facility.

Calpine's petition also requested that the Commission confirm that the scope of the required data should relate only to power generated for the wholesale market, excluding data related to power production already certified through a Commission-approved resource plan solicitation.[2]

In its December 26, 2003 ORDER VARYING RULE AND EXTENDING TIME LINE FOR COMMISSION ACTION, the Commission extended the time period to review Calpine's exemption request.

On December 29, 2003, the Department of Commerce (DOC) filed comments.

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[1] Minn. Rules, parts 7849.0010 et seq.

[2] See Minn. Stat. § 216B.2422, subd. 5.

Calpine filed reply comments on January 8, 2004.

This matter came before the Commission on January 22, 2004.

FINDINGS AND CONCLUSIONS

I. The Proposed Project

Calpine proposed building a power plant using natural gas-fired combustion turbines in a combined cycle configuration, which will be capable of producing approximately 630 megawatts (MW) of power. The facility will use natural gas with low-sulfur distillate oil as a back-up fuel. It will include two combustion turbine generators, two heat recovery steam generators equipped with duct burners, one steam turbine with an associated heat rejection system, and various other machinery and equipment.

The facility site is approximately 25 acres in size and is located north of the Mankato city limits within Lime Township. It will connect to the Northern Natural Gas pipeline approximately four miles east of the site and will have direct access to the transmission grid at the Wilmarth Substation approximately 1,500 feet west of the site.

Calpine has committed to supply approximately 375 megawatts of power to Northern States Power (NSP) after being selected in a bidding process approved by the Commission in its acceptance of NSP's resource planning process.[3] The portion of the facility that will supply the Commission approved power to NSP consists of one combustion turbine generator, one heat recovery steam generator, one steam turbine generator, one condenser, one multi-cell evaporative cooling tower and other appurtenant machinery and equipment.

Calpine will offer the power not committed to NSP to wholesale customers, including Minnesota utilities and cooperatives. Calpine seeks a Certificate of Need for the wholesale power production of the facility. The portion of the facility that will generate the wholesale power will include an additional combustion turbine generator and an additional heat recovery steam generator. The steam generator used for the power committed to NSP will also be used for the power to be sold to wholesale customers.

Calpine is planning to have the facility in-service by mid-2006.

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[3] See ORDER APPROVING XCEL ENERGY'S 2000-2014, Docket E-002/RP-00-787, *In the Matter of Northern States Power Company's Application for Approval of its 2000-2014 Resource Plan.*

II. The Legal Standard

The filing requirements for certificate of need applications are comprehensive and detailed. Because the certificate of need rules apply to a broad range of projects, the rules explicitly permit applicants to request exemptions from filing requirements that are inappropriate in individual cases. These rules permit the Commission to grant exemptions when the data requirements at issue (1) are unnecessary to determine need in a specific case; or (2) can be satisfied by submitting documents other than those required in the rules. Minn. Rules 7849.0200, subp. 6.

Further, Minnesota Statutes provide that an electric power generating plant selected in a bidding process approved by the Commission is exempt from the Certificate of Need proceeding. Minn. Stat. § 216B.2422, subd. 5(c).

III. Positions of the Parties

A. Calpine

1. Data Exemption Request

Calpine requested that the Commission grant it exemptions from certain certificate of need data requirements that, it argued, were not necessary to determine the need for an independent power production facility.

Calpine stated that the Commission has granted exemptions to data requirements in other cases involving independent utility generators where required data could not be readily obtained, was inapplicable to an independent power producer's plant or was not necessary to determine need.[4]

Calpine argued that as an independent power producer its ultimate customers are not end-user consumers and that Calpine has neither an assigned service area nor a system.[5] Therefore, information related to these components of the rules is either non-existent or not relevant and is not necessary to determine the need for the facility.

Calpine stated its intention to submit, where applicable, state or regional data relevant to assessing the need for the facility.

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[4] See *In the Matter of the Application by Koch Refining Co. for Certification of the Pine Bend Cogeneration Project,* Docket No. IP-2/CN-95-1406; *In the Matter of the Application of Lakefield Junction LL C for a Certificate of Need for a Large Electric Generating Facility,* Docket No. IP-3/CN-98-1453; *In the Matter of the Application by LSP-Cottage Grove L.P. for a Certificate of Need for a Large Generating Facility,* Docket No. IP-1/CN-94-004; *In re Rapids Power LLC,* Docket No. IP-4/CN-01-1306.

[5] As defined in Minn. Rules part 7849.0010, subp.29.

At hearing, Calpine stated that it will address, in general terms, the aspects of the alternatives analysis that the DOC raised. Calpine also agreed to give a full description of the project itself even though part of the project is subject to the all-source bidding project with Xcel.

2. Request for Determination of the Scope of Data Required

Calpine requested that the Commission determine that the scope of the data required in the Certificate of Need application relate only to power Calpine would generate for the wholesale market and to the additional facilities associated with supplying that power. The data required would not relate to the approximately 375 megawatts of power to be supplied to Xcel pursuant to the competitive bidding process.

Calpine stated that the additional facilities for wholesale power would be an additional combustion turbine generator and a heat recovery steam generator. All other machinery and equipment associated with the supply of wholesale power would be shared with the equipment already in place to supply the power pursuant to the all-source bidding project with Xcel.

In response to the DOC's recommendation that the certificate of need proceeding focus on the incremental impact of the addition of a wholesale power element to the project, Calpine indicated it had no objection to this provided the demonstration of need is limited to the wholesale portion of the facility and the natural gas required to generate that power.

B. The DOC

1. Regarding the Data Exemption Request

The DOC agreed, with two exceptions, that the exemptions requested by Calpine be granted. It agreed that for many of these the references to a system makes the data inapplicable to Calpine. The DOC noted that in several instances Calpine has offered to supply alternative information.

The DOC recommended that for Minn. Rules part 7849.0250 B1 and B3, which require addressing the availability of alternatives, that the Commission deny the exemptions and require Calpine to address, at least in general terms, the fact that purchased power from other sources will not be an alternative to the facility (B1) and that new transmission will not be an alternative to the facility (B3). The DOC argued that the exemption should be denied because Calpine's reasons were not reasonable grounds to grant an exemption.

2. Regarding Calpine's Request to Determine the Scope

The DOC recommended that the certificate of need proceeding focus on the incremental impact of the addition of a wholesale power element to the plant selected in Xcel's all-source bidding process. It argued that although the additional facilities may be limited to a combustion turbine generator and a heat recovery steam generator, the incremental impact may be more widespread

than just the two additional pieces of equipment that Calpine proposes for this facility. For example, the DOC raised the likelihood that the natural gas line will be shared and questioned whether, due to this, the line would be somewhat larger and more costly.

IV. Exemptions Granted

A. Background

The Commission will grant the exemptions requested by the Company on the grounds that the information to which they relate is unnecessary to determine need. The Commission notes that, where applicable, the Company has agreed to file alternative data relevant to the assessment of need.

Most of the filing requirements from which the Company seeks relief pertain to regulated utilities. They speak of the applicant's "system," a term defined in the rules to include the applicant's assigned service area and all equipment and facilities used to serve the retail consumers within that assigned service area.[6] Since Calpine has neither retail consumers nor an assigned service area, it does not have a system. Therefore, information on Calpine's system does not exist, is not relevant to the application and is not relevant for determining need.

Further, the Company has proposed filing, when applicable, state or regional data relevant to assessing the need for the facility. For example, when the rules call for filing information on the proposed facility's effects on retail rates, the Company will file information on the effects on wholesale rates. The additional information the Company proposes to file will further aid in determining need.

Finally, since the Company must prove need for the proposed facility, the Company has a continuing incentive to provide full and complete information as the application is reviewed.

B. Specific Exemptions

Specifically, the Commission will grant exemptions to the following Minn. Rules:

1. Availability of Alternatives - Minn. Rules 7849.0250 B (1-3)

This rule requires Calpine to discuss the availability of alternatives to the facility, including purchased power, increased efficiency of existing facilities, including transmission lines, and new transmission lines.

Calpine requested an exemption because it does not purchase power, it has no existing facilities in Minnesota at which it might seek improved operating efficiency and does not own or operate any

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[6] Minn. Rules 7849.0010, subp. 29.

transmission lines either within the service area where the facility will be located or anywhere else in the country. Further, it cannot readily obtain data for a discussion of these factors as it relates to facilities operated by other entities.

Calpine stated that it will be discussing the alternatives of a generating facility of a different size or using a different energy source, pursuant to Minn. Rules 7849.0250(B)(4), in addition to discussing aspects of the facility that relate to its efficient operation.

The Commission will grant the exemption, finding that Calpine has stated reasonable grounds and has made an alternative proposal that will add information more specifically related to determining need for the proposed facility. This exemption is granted because the information to which it relates is not necessary to determine need.

2. Effects on Rates Systemwide - Minn. Rules 8749.0250 C(7)

The rule requires an applicant to estimate its facility's effect on rates systemwide and in Minnesota, assuming a test year beginning with the proposed in-service date of the plant.

Calpine requested this exemption because it does not have a "system" as defined in the rules and does not have regulated rates for power it plans to generate. Calpine proposed to submit data on its project's impact on state or regional wholesale prices.

The Commission finds that "system" has the meaning given in the rules and that the Company does not have rates set on the basis of a test year. This non-existent information is not necessary to determine need. Rather, the Company's proposal to submit information on the project's impact on state or regional wholesale rates will serve the purpose of ensuring that the cost of utility service is considered in the certificate of need review.

This exemption is granted because the information to which it relates is not necessary to determine need.

3. System Map - Minn. Rules 8749.0250 D

The rule requires the applicant to file a map of its system. The Company requested an exemption on the grounds that it does not have a system, as defined in the rules. Calpine proposed submitting a map showing the proposed site and its location relative to the power grid and natural gas supplies.

The data required in this rule is unnecessary to determine the need for an independent power producer's plant and the exemption will be granted.

4. Peak Demand and System Capacity - Minn. Rules 7849.0270 and 7849.0280

The rule requires an applicant to submit pertinent data concerning peak demand and projected annual electrical consumption, and system capacity within the applicant's service area and system. The company requested an exemption on the grounds that it does not have a system as defined in the rules.

Calpine stated that it would submit regional demand, consumption, and capacity data from credible sources to demonstrate the need for the independently produced energy that will be generated by the facility. The Commission recognizes that the filing of this alternative information will pertain directly to its intended market, wholesale power sales, and will meet the purposes of the rule.

This exemption is granted because the information to which it relates is not necessary to determine need.

5. Energy and Conservation Plans - Minn. Rules 7840.0290

This rule requires an applicant to describe present and future energy conservation and efficiency plans, including the effect of conservation in reducing the applicant's need for new generation and transmission facilities.

As the Commission has previously noted,[7] this rule is designed to ensure that a regulated utility give conservation the same consideration that it gives new generation when planning to meet the future needs of its service area. Since Calpine is not a regulated utility, Calpine sought an exemption from this rule. The Commission agrees that different considerations apply in the wholesale context thereby making the requirements of this rule unnecessary.

This exemption is granted because the information to which it relates is unnecessary to determine need.

6. Effect of Delay on Systems and Power Pool - Minn. Rules 7849.0300

This rule requires that the applicant discuss the consequences of a delay in the construction of the proposed facility on the applicant's system, neighboring systems and the power pool. Calpine again indicated that it did not have a service area or system, as defined in the rules. Calpine proposed to submit data on the consequences of delay to its potential customers and the region.

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[7] *In the Matter of the Application of Rapids Power LLC for a Certificate of Need for its Grand Rapids Cogeneration Project,* Docket No. IP-4/CN-01-1306, ORDER GRANTING EXEMPTIONS FROM FILING REQUIREMENTS, PERMITTING EXPEDITED FILING, AND EXTENDING PERIOD TO DETERMINE ADEQUACY OF FILING (October 9, 2001).

This exemption is granted because the information to which it relates is not necessary to determine need.

7. The Alternative of No Facility - Minn. Rules 7849.0340

The rule requires that the applicant analyze how not building the proposed facility would impact its generation and transmission facilities, system and operations. The rule also requires an analysis of equipment and measures that may be used to reduce the environmental impact of not building the proposed facility.

Calpine again indicated that it does not have a system as defined in the rules, nor does it have other generation and transmission facilities in Minnesota. Calpine proposed to submit data reasonably available to it regarding the impact on the wholesale market of the "no facility" alternative.

This exemption is granted because the information to which it relates is not necessary to determine need.

8. Relationship to Promotional Activities - Minn. Rules 7849.0240, subp. 2 (B)

This rule requires an applicant to discuss the relationship of the proposed facility to promotional activities that gave rise to the demand for the facility. The Company requested an exemption based on the fact that it had not engaged in any promotional activities and therefore had no data to report.

This requirement is not necessary to determine the need for an independent producer's project. Therefore, the exemption is granted.

C. Scope of Data Required For Application

The Commission grants Calpine's request to limit the scope of Calpine's certificate of need application to data demonstrating a need for the power that the Company will generate for the wholesale market. This would exclude any data related to the approximately 375 MW to be purchased through Xcel's Commission- approved bidding process. The Commission agrees with Calpine that such a limitation is provided for by Minnesota Statute.

However, the Commission recognizes that it may be difficult to consider only a part of a proposed facility. The Commission, in considering the certificate of need application, may require an understanding of the equipment and machinery used to supply the power committed to Xcel in order to fully understand the project. For this reason, the Commission clarifies that although it may limit the scope of the data required to the power generated for the wholesale market, such a limitation should not be seen by the Company as reason to refuse reasonable requests for information on the project as a whole.

Further, the Commission notes that, as of the date of this Order, a Power Purchase Agreement (PPA) between Xcel and Calpine has not been submitted for Commission approval. Since only the completion of this required final step in the competitive bidding process will give rise to the certificate of need statutory exemption that Calpine requests, the Commission makes its determination on the issue of the scope of the certificate of need filing conditional on Calpine's meeting all requirements for the exemption. This in no way restricts the Company from pursuing both the certificate of need and the final PPA simultaneously.

ORDER

1. The Commission grants the petition of Calpine Corporation for exemptions from specific data requirements in the certificate of need rules as set forth herein.

2. The Commission grants the request of Calpine Corporation to limit the scope of its certificate of need application with the qualifications set forth herein.

3. This Order shall become effective immediately.

BY ORDER OF THE COMMISSION

Burl W. Haar

Burl W. Haar
Executive Secretary

(S E A L)

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November 25, 2003

VIA MESSENGER

Burl W. Haar
Executive Secretary
Minnesota Public Utilities Commission
121 East Seventh Place, Suite 250
St. Paul, MN 55101

Re: Request for Exemption from Certain Data Filing Requirements And Order Establishing Scope of Application

Dear Dr. Haar:

I have enclosed the original signature and 14 copies of the following for filing with the Minnesota Public Utilities Commission in the above-referenced matter:

Request for Exemption From Certain Data Filing Requirements and Order Establishing Scope of Application;

Certificate of Service.

Please return one file-stamped copy of the Request for Exemption from Certain Data Filing Requirements and Order Establishing Scope of Application in the self-addressed stamped envelope provided.

By copy of this letter, service is made upon all persons listed in the Certificate of Service.

Please call me if there are any questions concerning this filing.

Very truly yours,

B. Andrew Brown

B. Andrew Brown

Enclosures
cc: Kent J. Morton (w/ enclosures)

bcc: James J. Shield, PE (w/ enclosures)
Jason M. Goodwin, PE (w/ enclosures)
Jon P. Sandstedt (w/ enclosures)
Michael Pignato, Esq. (w/ enclosures)
Wilda Wahpepah, Esq. (w/ enclosures)
File

STATE OF MINNESOTA
BEFORE THE
PUBLIC UTILITIES COMMISSION

Leroy Koppendrayer	Chair
Gregory Scott	Commissioner
Kenneth Nickolai	Commissioner
Phyllis Reha	Commissioner
R. Marshall Johnson	Commissioner

In the Matter of the Application of Calpine Corporation for a Certificate of Need

Docket No. IP-_____

REQUEST FOR EXEMPTION
FROM CERTAIN DATA FILING REQUIREMENTS AND ORDER ESTABLISHING SCOPE OF APPLICATION

I. INTRODUCTION

Calpine Corporation ("Calpine"), an independent power producer, intends to file an Application for a Certificate of Need, pursuant to Minn. R. 7849.0200, to construct and operate a natural gas-fired combined cycle electric generating facility at a site near Mankato, Minnesota (the "Facility"). Calpine respectfully requests the Minnesota Public Utilities Commission ("Commission"): (i) grant it certain exemptions, pursuant to Minn. R. 7849.0200, subpt. 6, from certain Certificate of Need data requirements that are not necessary to determine the need for an independent power production facility; and (ii) establish that the scope of data required for Calpine's Application for a Certificate of Need should relate only to power generated for the wholesale market, excluding data related to power production already certified through a Commission-approved resource plan solicitation.

With regard to the first request, the exemptions should be granted because the data in issue is either not applicable to a generation project proposed by an independent power producer,

not reasonably available to Calpine, or not necessary to determine the need for the proposed facility. With regard to the second request, Calpine believes it both prudent and efficient to confirm the scope of required data before filing its Application for a Certificate of Need.

II. PROJECT DESCRIPTION

Calpine proposes to build a power plant capable of producing approximately 630 megawatts of power (at summer ambient conditions) using natural gas-fired combustion turbines in a combined cycle configuration. Low sulfur distillate oil will be used as a back-up fuel. The Facility will be designed to include two combustion turbine generators, two heat recovery steam generators equipped with duct burners, one steam turbine with an associated heat rejection system, and various appurtenant machinery and equipment required for a safe and efficient operating power plant.

Cooling and process water will be supplied by effluent taken from the Mankato municipal wastewater treatment system, which is located approximately one mile south of the Facility site on the east bank of the Minnesota River. The municipal wastewater will be further treated prior to delivery to the Facility site at a new treatment facility that is expected to be located on land adjacent to the existing municipal treatment plant. Cooling water and low-volume wastewater will be discharged to the Minnesota River in accordance with applicable discharge limits.

The Facility site is located north of the Mankato city limits within Lime Township, and is approximately 25 acres in size. The area is currently zoned for industrial use. The City of Mankato and Lime Township entered into a Joint Resolution for Orderly Annexation on November 12, 1997, whereby the parties agreed that the City of Mankato would annex areas to be developed for residential, commercial, industrial, and governmental purposes so as to

encourage orderly urban development using municipal services in a responsible, controlled, and environmentally sound manner.

The Facility will connect to the Northern Natural Gas pipeline located approximately four miles east of the Facility site. The site has direct access to the transmission grid via the Wilmarth Substation located approximately 1,500 feet directly west of the site and will not require a lengthy, off-site high voltage transmission line.

Calpine has committed to supply approximately 375 megawatts of power to Northern States Power ("NSP"), a subsidiary of Xcel Energy, after being selected in a bidding process approved by the Commission in its acceptance of NSP's resource planning process. See Docket E-002/RP-00-787. An electric power plant selected in a bidding process approved by the Commission is exempt from Certificate of Need proceedings. Minn. Stat. §§ 216B.243; 216B.2422, subd. 5. The portion of the Facility that will supply the Commission-approved electric power to NSP includes one combustion turbine generator, one heat recovery steam generator, one steam turbine generator, one condenser, one multi-cell evaporative cooling tower, and those appurtenant pieces of machinery and equipment that are required for a safe and efficient operating power plant in the configuration described above.

The balance of power generated at the Facility will be offered for sale to wholesale customers, including Minnesota utilities and cooperatives that project a need for power supplies. Calpine seeks a Certificate of Need for the wholesale power production portion of the Facility. The portion of the Facility that will generate wholesale power will include one additional combustion turbine generator and one additional heat recovery steam generator. The same steam turbine generator and other appurtenant machinery and equipment used for the supply of

Commission-approved power for NSP will be used to supply the additional power intended for sale to wholesale customers.

Calpine is planning, subject to receipt of applicable regulatory approvals, to have the Facility constructed and in-service by mid-2006.

III. EXEMPTION REQUESTS

A. Data Exemptions

The Minnesota Rules describe in detail the data an applicant seeking a Certificate of Need is required to submit to the Commission. Minn. R. Ch. 7849. The Rules allow an applicant, before submitting a Certificate of Need Application, to seek an exemption from data that "is unnecessary to determine the need for the proposed facility or may be satisfied by submitting another document." Minn. R. 7849.0200, subpt. 6. The Commission has granted exemptions to data requirements in cases involving unregulated, i.e., independent, utility generators where the required data could not readily be obtained, was inapplicable to a non-utility generator, or was not necessary to determine need. See Docket No. IP-2/CN-95-1406, In the Matter of the Application by Koch Refining Co. for Certification of the Pine Bend Cogeneration Project; Docket No. IP-3/CN-98-1453, In the Matter of the Application of Lakefield Junction LLC for a Certificate of Need for a Large Electric Generating Facility; Docket No. IP-1/CN-94-004, In the Matter of the Application by LSP-Cottage Grove L.P. for a Certificate of Need for a Large Generating Facility; and Docket No. IP-4/CN-01-1306, In re Rapids Power LLC (the "Rapids Power Order"). The Commission also has recognized that the Certificate of Need Rules were enacted when power plants were built only by regulated utilities with corresponding duties to the public to supply adequate, safe, and affordable power. See Rapids Power Order. Consequently, such considerations are not relevant where the construction

of a facility is a business decision made by a non-regulated entity that is willing to assume all commercial and technical risks.

Calpine seeks exemptions for certain data requirements that are specific to the operation and regulation of facilities proposed by utilities, and consistent with the relief the Commission has previously granted independent power producers. As the Commission held in its Rapids Power Order, certain filing requirements pertain to utilities and refer to the applicant's "system," which is defined as an assigned service area, and all the equipment and facilities used to serve retail consumers within that assigned service area. Minn. R. 7849.0010, subpt. 29; see also Minn. R. 7849.0010, subpt. 31 (defining "ultimate consumer" as consumer purchasing power for its own use and not for resale). Calpine has neither an assigned service area nor a system. As an independent power producer, its ultimate customers are not end-user consumers. Thus, information related to these components of the Rules is either non-existent or not relevant to the application, and is not necessary to determine need for an independent power producer's project. Where applicable, Calpine will submit state or regional data relevant to assessing the need for the Facility.

Specifically, Calpine requests exemptions from the following data requirements:

1. Minn. R. 7849.0250, Part B (1-3) (Alternatives)

Minn. R. 7849.0250, Part B (1-3), requires an applicant to discuss the availability of alternatives to the facility, including purchased power, increased efficiency of existing facilities, including transmission lines, and new transmission lines. With respect to the alternative of purchased power, Calpine is not a regulated utility, thus it does not purchase power. Indeed, Calpine is in the business of selling power to such entities as NSP. With respect to the alternative of increased efficiency, Calpine has no existing facilities in Minnesota at which it

might seek to improve the operating efficiency. The type of facility Calpine intends to build will use the most efficient type of generating technology for large-scale power generation that is available today. It will be much more efficient and much more environmentally friendly than traditional fossil fuel technologies. The fact that the Facility will not require the construction of lengthy transmission lines off-site makes any discussion of efficiency improvements to the Facility's interconnecting transmission lines inapplicable. Moreover, Calpine does not own or operate transmission lines within the service area at which the Facility will be located or, for that matter, anywhere else in Minnesota or the United States, at which it might seek to improve the operating efficiency. With respect to the alternative of new transmission lines, the development, construction, and operation of transmission and distribution lines is best left to regulated utilities with defined service obligations to retail consumers. Calpine is neither qualified nor willing to enter into the business of transmission line operation or ownership.

Because Calpine cannot readily obtain data for a discussion of these factors for facilities operated by other entities, and because the data is not necessary to determine the need for Calpine's Facility, Calpine proposes instead to discuss, pursuant to Minn. R. 7849.0250(B)(4), the alternatives of a generating facility of a different size or using a different energy source, in addition to aspects of the Facility that relate to its efficient operation.

2. Minn. R. 7849.0250, Part C(7) (Facility's Effect on Rates Systemwide)

Minn. R. 7849.0250, Part C(7), requires an applicant to estimate its facility's effect on rates systemwide and in Minnesota, assuming a test year beginning with the proposed in-service date of the plant. Calpine requests an exemption from this requirement because it does not have a "system" as defined by the Rules and does not have regulated rates for the power it plans to

generate. Instead, Calpine proposes to submit data on its project's impact on state or regional wholesale prices.

3. Minn. R. 7849.0250, Part D (System Map)

Minn. R. 7849.0250, Part D, requires Calpine to file a map of its system with its application. Calpine requests an exemption from this requirement because it does not have a "system" as defined by the Rules, and therefore such data would be unnecessary to determine need for an independent power producer's plant. Instead, Calpine proposes to submit a map showing the proposed site and its location relative to the power grid and natural gas pipeline supplies.

4. Minn. R. 7849.0270 (Peak Demand and Annual Consumption)

Minn. R. 7849.0270 requires an applicant to submit pertinent data concerning peak demand and annual electrical consumption "within the applicant's service area and system." Calpine requests an exemption from Minn. R. 7849.0270 because it does not have a "system" as defined by the Rules. Calpine will sell power generated by the Facility on the wholesale market to one or more buyers affiliated with different systems and serving different areas. Thus, Calpine cannot not reasonably forecast peak demand or consumption for its potential customers. Instead, Calpine proposes to submit regional demand, consumption, and capacity data from credible sources to demonstrate the need for the independently produced energy that will be generated by the Facility.

5. **Minn. R. 7849.0280 (Ability of Existing System to Meet Electrical Demand)**

Minn. R. 7849.0280 requires an applicant to describe the ability of its "existing system" to meet the demand for electrical energy forecast in response to Part 7840.0270 and the extent to which the facility will increase the capability. Calpine requests an exemption from Minn. R. 7849.0280 because it does not have a "system" as defined by the Rules. As previously mentioned, Calpine proposes to submit regional demand, consumption, and capacity data from credible sources to demonstrate the need for the independently produced energy that will be generated by the Facility.

6. **Minn. R. 7840.0290 (Energy and Conservation Plans)**

Minn. R. 7840.0290 requires an applicant to describe its energy and conservation plans, including load management, and the effect of conservation in reducing the applicant's need for new generation and transmission facilities. As the Commission has previously recognized, this Rule is "designed to ensure that regulated utilities, providing essential services to captive customers, give conservation the same careful consideration given to new generation" in planning the future needs of the utility's service area. Rapids Power Order at 3. Because different considerations apply in the wholesale context, the requirements of Minn. R. 7840.0290 are "essentially unhelpful" to the Commission's determination. Id. Calpine is not a regulated utility and requests an exemption from this requirement in its entirety.

7. **Minn. R. 7849.0300 (Effect of Delay on Systems and Power Pool)**

Minn. R. 7849.300 requires an applicant to discuss the consequences of delay "to its system, neighboring systems, and the power pool" should the facility be delayed one, two, and three years, or postponed indefinitely. Since Calpine is not a utility, it has no "system" as defined by the Rules. Thus, the data required by Minn. R. 7849.0300 is inapplicable to Calpine

and unnecessary to determine the need for an independent power producer's plant. Instead, Calpine proposes to submit data on the consequences of delay to its potential customers and the region.

8. Minn. R. 7849.0340 ("No Facility" Alternative)

Minn. R. 7849.0340 requires an applicant to submit data for the alternative of "no facility," including a discussion of the impact of this alternative on its generation and transmission facilities, system, and operations. The rule also requires an analysis of equipment and measures that may be used to reduce the environmental impact of the alternative of no facility. Calpine does not have a "system" as defined by the Rules, nor does it have other generation and transmission facilities in Minnesota. The requirements of Minn. R. 7849.0340 are not applicable to Calpine's project and are not necessary to determine need for the facility. Instead, Calpine proposes to submit data reasonably available to it regarding the impact on the wholesale market of the "no facility" alternative.

9. Minn. R. 7849.0240, Subpt. 2 (B) (Relationship to Promotional Activities)

Minn. R. 7849.0240, subpt. 2 (B), requires an applicant to discuss the relationship of the proposed facility to promotional activities that gave rise to the demand for the facility. The Commission has recognized that this requirement is not necessary to determine the need of an independent producer's project because the proponent has not engaged in any promotional activities and lacks data to report. Calpine requests an exemption from this requirement in its entirety.

B. <u>Scope of Data Required For Application</u>

As noted above, a portion of the power to be generated by the Facility was selected in a bidding process approved by the Commission and is exempt from the Certificate of Need

process. See Minn. Stat. §§ 216B.243, 216B.2422, subd. 5; Docket E-002/RP-00-787. The Facility will generate this power using one combustion turbine generator, one heat recovery steam generator, one steam turbine generator, one condenser, one multi-cell evaporative cooling tower, and those appurtenant pieces of machinery and equipment that are required for a safe and efficient operating power plant.

Calpine respectfully requests that the Commission establish by Order that the scope of data required in its Application for a Certificate of Need relates only to demonstrating a need for the power it would generate for the wholesale market and the additional facilities associated with supplying that power. The facilities Calpine would require for the generation of such additional power would be limited to one combustion turbine generator and one heat recovery steam generator. All other machinery and equipment associated with the supply of the wholesale power portion of the Facility would be shared with that already in place for the Commission-approved portion of the Facility.

IV. CONCLUSION

Calpine has requested exemptions from data requirements related to regulated utilities on the grounds that such data is not reasonably available to an independent power producer, inapplicable to an independent power producer's plant, or not necessary to determine the need for such a project. Where applicable, Calpine will submit regional or state data that would be relevant to the Commission's determination on the need for this facility. Calpine's request is consistent with the Commission's previous exemptions granted to independent power producers. Calpine respectfully requests the Commission grant this request for filing exemptions from the Certificate of Need requirements listed above.

Calpine has also requested that the Commission establish the scope of data required in its Application for a Certificate of Need. Because approximately 375 megawatts of power to be

generated at the plant was selected through a bidding process approved by the Commission, Calpine respectfully requests that the required data for its Application relate only to demonstrating a need for that portion of the Facility that generates power for the wholesale market.

Respectfully submitted this 25th day of November, 2003.

CALPINE CORPORATION

By: B. Andrew Brown

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CERTIFICATE OF SERVICE

I hereby certify that on November 25, 2003, I served by local messenger the indicated number of copies of the Request for Exemption from Certain Data Filing Requirements and Order Establishing Scope of Application upon the following persons:

Original and 14 copies to:

Burl W. Haar
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121 East Seventh Place, Suite 350
St. Paul, MN 55101

One copy to:

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Residential Utilities Division
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St. Paul, MN 55101

One copy to:

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St. Paul, MN 55101

One copy to:

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Telecommunications & Energy Division
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St. Paul, MN 55101

One copy to:

Michael Sullivan
Executive Director
Environmental Quality Board
658 Cedar Street, Third Floor
St. Paul, MN 55155

One copy to:

Kathy Aslakson
Docket Coordinator
Minnesota Department of Commerce
85 7th Place East, Suite 500
St. Paul, MN 55101

One copy to:

Alan R. Mitchell
Environmental Quality Board
658 Cedar Street, Third Floor
St. Paul, MN 55155

One copy to:

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DORSEY & WHITNEY LLP

By: Wilda Wahpepah
Wilda Wahpepah

MINNESOTA
DEPARTMENT OF
COMMERCE

DEC 30 2003

85 7th Place East, Suite 500
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651.296.4026 FAX 651.297.1959 TTY 651.297.3067

December 29, 2003

Burl W. Haar
Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
St. Paul, Minnesota 55101-2147

RE: **Comments of the Minnesota Department of Commerce**
Docket No. IP6345/CN-03-1884

Dear Dr. Haar:

Attached are the comments of the Energy Division of the Minnesota Department of Commerce in the following matter:

Calpine Corporation's Request for Exemption from Certain Data Filing Requirements and Order Establishing Scope of Application.

The petition was filed on November 25, 2003. The Petitioner is:

B. Andrew Brown
Dorsey & Whitney LLP
50 South 6th Street, Suite 1500
Minneapolis, Minnesota 55402

The Department recommends **approval with modification** and is available to answer any questions the Commission may have.

Sincerely,

MATT LACEY
Rates Analyst

ML/ja
Attachment

DEC 3 0 2003

BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

COMMENTS OF THE MINNESOTA DEPARTMENT OF COMMERCE

DOCKET NO. IP6345/CN-03-1884

I. BACKGROUND

Calpine Corporation (Calpine or the Company) proposes to construct a 630 MW combined cycle electric generation facility fueled by natural gas with fuel oil as a back up. Calpine indicates that the Company has committed to supply about 375 MW to Northern States Power Company d/b/a Xcel Energy (Xcel) via Xcel's Commission-approved bidding process. The balance of the power, about 255 MW, will be offered for sale to wholesale customers.

Considered as a merchant, the 255 MW portion of the facility qualifies as a large energy facility (LEF) under Minnesota Statutes § 216B.2421, subd. 2 (1). Minnesota Statutes § 216B.243, subd. 2 requires that any LEF obtain a certificate of need (CN) from the Minnesota Public Utilities Commission (Commission). Minnesota Rules part 7849 includes the filing requirements for a CN for an electric generating facility.

On November 25, 2003 Calpine submitted its *Request for Exemption from Certain Data Filing Requirements and Order Establishing Scope of Application* (Petition) in order to obtain exemption from certain requirements of Minnesota Rules part 7849. Calpine is requesting exemption from providing data relevant to a utility system, such as system maps and system capacity. Calpine is also requesting that the Commission establish that the scope of the data required for Calpine's Petition should relate only to power generated for the wholesale market. This request would exclude data related to the 375 MW to be purchased through Xcel's Commission-approved bidding process.

In response to the Petition, the Commission issued a *Notice of Comment Period* on the Company's Petition on December 2, 2003. The Energy Division of the Minnesota Department of Commerce (Department) submits these *Comments* pursuant to the Commission's *Notice of Comment Period.*

II. DEPARTMENT ANALYSIS

A. *DATA EXEMPTION REQUEST*

Minnesota Rules 7849.0200, subp. 6 states "Before submitting an application, a person is exempted from any data requirement of this chapter if the person (1) requests an exemption from specified rules, in writing to the commission, and (2) shows that the data requirement is unnecessary to determine the need for the proposed facility or may be satisfied by submitting another document." Several independent power producers (IPP) have filed requests for exemption from filing certain data.[1] Each applicant was granted different exemptions for different reasons. Generally, multiple prior IPP applicants' proposals have been granted an exemption regarding the following Minnesota Rules:

- 7849.0240 Subp. 2 (B), Promotional activities;
- 7849.0250 D, System map;
- 7849.0270, Peak demand and annual consumption forecast;
- 7849.0280, System capacity;
- 7849.0290, Conservation programs;
- 7849.0300, Consequences of delay; and
- 7849.0340 The alternative of no facility.

The Department relied upon the specific facts of Calpine's Petition along with the Commission's past precedents when analyzing the exemption request. Specifically, the Petition requests exemption from the following data requirements:

- 7849.0240 Subp. 2 (B)—Promotional activities;
- 7849.0250 B (1 to 3)—Alternatives;
- 7849.0250 C (7)—Effect on rates system-wide;
- 7849.0250 D—System map;
- 7849.0270—Peak demand and annual consumption forecast;
- 7849.0280—System capacity;
- 7849.0290—Conservation programs;
- 7849.0300—Consequences of delay; and
- 7849.0340—Alternative of no facility.

Calpine's stated reason for these requested exemptions is that the Company has neither an assigned service area nor a system. Thus, the information required by these rules is either non-

---

[1] See Docket Nos. IP1/CN-94-4 (LSP-Cottage Grove, L.P.), IP2/CN-95-1406 (Koch Refining Company), IP3/CN-98-1453 (Lakefield Junction LLC), IP4/CN-01-1306 (Rapids Power LLC), IP6158/CN-02-1333 (MAPP Wind II, LLC), and IP6339/CN-03-1841 (Trimont Area Wind Farm LLC).

existent or not relevant. In many instances Calpine proposes to submit alternative (state and regional) data relevant to addressing the need for the facility. The following rules require data pertaining to an applicant's system. Multiple prior IPP applicants have been exempted from these rules, and Calpine has offered to supply alternative information:

- 7849.0250 D—System map;
- 7849.0270—Peak demand and annual consumption forecast;
- 7849.0280—System capacity;
- 7849.0300—Consequences of delay; and
- 7849.0340—Alternative of no facility.

In addition, the following rules require data pertaining to an applicant's system from which multiple prior IPP applicants have been exempted. Calpine has not offered alternative information for these rules.

- 7849.0240 Subp. 2 (B)—Promotional activities; and
- 7849.0290—Conservation programs;

The Department agrees with Calpine's analysis of these seven data requirements. Specifically, the reference to a system makes the data inapplicable in whole or in part to Calpine. Therefore, the Department recommends that the Commission approve Calpine's proposed exemptions to the above data requirements.

Regarding Minnesota Rules part 7849.0250 C (7) (Effect on rates system-wide), one prior applicant was granted an exemption to this data requirement.[2] The data requirement clearly involves system-wide information and Calpine has no system. Further, Calpine proposes to submit alternative data. Therefore, the Department recommends that the Commission approve Calpine's proposed exemption.

Regarding Minnesota Rules part 7849.0250 B 1 to B 3 (Alternatives), one prior applicant was granted an exemption to parts B 2 and B 3 of this data requirement.[3] Regarding part B 1 (purchased power), Calpine states that it is not a regulated utility and does not purchase power. Calpine further states that its proposed facility will use the most efficient type of generating technology for large-scale power generation that is available today. Calpine's stated reasons would be adequate statements that would rule out this option in the context of a certificate of need application. It is less clear that they are reasonable grounds to grant an exemption. The Department recommends that the Commission deny the requested exemption and require Calpine to address, at least in general terms, the fact that purchased power from other sources will not be an alternative to the facility.

---

[2] See Docket No. IP4/CN-01-1306 (Rapids Power LLC).

[3] See Docket No. IP1/CN-94-4 (LSP-Cottage Grove, L.P.).

Regarding part B 2 (increased efficiency of existing facilities, including transmission), given that Calpine does not own any transmission or generation in Minnesota, the Department concludes that the data requirement of part B 2 is inapplicable. Therefore, the Department recommends that the Commission grant the requested exemption.

Regarding part B 3 (new transmission), Calpine states that the Company is not in the business of building transmission and is neither qualified nor willing to enter that business. Calpine's stated reasons would be adequate statements that would rule out this option in the context of a certificate of need application. The Department recommends that the Commission deny the requested exemption and require Calpine to address, at least in general terms, the fact that new transmission will not be an alternative to the facility.

Regarding Minnesota Rules 7849.0240, Subp. 2(B) and 7849.0290, one prior applicant was granted an exception to these data requirements and did not propose to provide any alternative information.[4]

In summary, the Department recommends that the Commission grant each of Calpine's proposed exemptions with the exception of 7849.0250 B1 and 7849.0250 B3.

B. SCOPE OF DATA CLARIFICATION REQUEST

Calpine requests that the Commission clarify that the scope of data required in the subsequent application for certificate of need would relate only to demonstrating a need for the power it would generate for the wholesale market and the additional facilities associated with supplying that power rather than the total power for the facility, including the amount to be supplied to Xcel pursuant to the competitive bid process. Calpine states that the additional facilities for wholesale power would be limited to a combustion turbine generator and a heat recovery steam generator. All other equipment would be shared with that already in place for the portion of the facility selected in the Commission-approved all-source bid.

The Department concludes that the certificate of need proceeding should focus on the incremental impact of the addition of a wholesale power element to the plant, which was selected in Xcel's all-source bidding process. It may be that additional facilities are limited to a combustion turbine generator and a heat recovery steam generator. However, the incremental impact may be more widespread than two additional pieces of equipment. For example, it is likely that the natural gas distribution line will be shared. However, the incremental impact may be that the distribution line is somewhat larger and somewhat more costly. Thus, the Department recommends that the Commission clarify that the scope of the data required from Calpine is limited to the incremental impact of the claimed need to address the wholesale market on Calpine's project.

[4] See Docket No. IP4/CN-01-1306 (Rapids Power LLC).

III. DEPARTMENT RECOMMENDATION

The Department recommends that the Commission approve with the exception of 7849.0250 B1 and 7849.0250 B3 the exemptions requested by Calpine and clarify that the scope of the data is limited to the incremental impact of the claimed need to address the wholesale market on Calpine's project.

/ja

STATE OF MINNESOTA)
) ss
COUNTY OF RAMSEY)

AFFIDAVIT OF SERVICE

I, **Kathy Aslakson**, on the **29th** day of **December, 2003,** served the attached **Minnesota Department of Commerce Comments**

MN PUC DOCKET NUMBER(S): IP6345/CN-03-1884

XX by depositing in the United States Mail at the City of St. Paul, a true and correct copy thereof, properly enveloped with postage prepaid
XX by personal service (MN PUC)
by delivery service
by express mail

to all persons at the address indicated below and/or on the attached list:

Kathy Aslakson

In the Matter of Calpine Corporation
Request for Excemption from Data
Filing Requirements
1 Service List

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Request for Exemption from Data
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Request for Exemption from Data
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In the Matter of Calpine Corporation
Request for Excemption from Data
Filing Requirements
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January 8, 2004

Dr. Burl W. Haar
Executive Secretary
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St. Paul, MN 55101-2147

VIA MESSENGER

Re: Request for Exemption from Certain Data Filing Requirements And Order Establishing Scope of Application, Docket No. IP-6345/CN-03-1884

Dear Dr. Haar:

I have enclosed the original signature and 15 copies of Calpine's Reply to Comments On Request for Exemption from Certain Data Filing Requirements for filing with the Minnesota Public Utilities Commission and a Certificate of Service in the above-referenced matter.

Please return one file-stamped copy of the Reply to Comments On Request for Exemption from Certain Data Filing Requirements in the self-addressed stamped envelope provided.

By copy of this letter, service is made upon all persons listed in the Certificate of Service.

Please call me if there are any questions concerning this filing.

Very truly yours,

B. Andrew Brown

B. Andrew Brown

Enclosures

cc: Kathy Aslakson (4 copies)
Julia Anderson
Curt Nelson
Elizabeth Goodpaster
Tim Hunstad
Kent Morton

bcc: Jason Goodwin
Jon Sandstedt
Michael Pignato
Wilda Wahpepah
File

STATE OF MINNESOTA
BEFORE THE
PUBLIC UTILITIES COMMISSION

LeRoy Koppendrayer	Chair
Marshall Johnson	Commissioner
Ken Nickolai	Commissioner
Phyllis A. Reha	Commissioner
Gregory Scott	Commissioner

In the Matter of the Application of Calpine Corp. for a Certificate of Need	**Docket No. IP-6345/CN-03-1884**

CALPINE'S REPLY TO COMMENTS ON REQUEST FOR EXEMPTION FROM CERTAIN DATA FILING REQUIREMENTS

I. INTRODUCTION

Calpine Corp. ("Calpine"), an independent power producer, plans to construct and operate a natural-gas fired combined cycle electric generating facility (the "Project") at a site near Mankato, Minnesota, and intends to file an application for a Certificate of Need for the Project with the Minnesota Public Utilities Commission ("Commission"). On November 25, 2003, Calpine filed a petition requesting exemptions from certain data elements required by the rules governing applications for a Certificate of Need for large electric generating facilities, Minn. R. ch. 7849. Calpine also requested the Commission clarify that the scope of data required for its application should relate only to power generated for the wholesale market, excluding a demonstration of need for power production already certified through a Commission-approved resource plan solicitation.

The Commission staff issued a Notice of Comment on Calpine's request on December 2, 2003, setting December 29, 2003, for the submittal of comments and January 8, 2004, for the submittal of replies. The Department of Commerce filed comments on December 29, 2003,

recommending approval of Calpine's request with modification. Specifically, the Department of Commerce recommended the Commission exempt Calpine from the following data requirements:

> Minn. R. 7849.0240, subp. 2(B) – promotional activities;
>
> Minn. R. 7849.0250B(2) – increased efficiency of existing facilities;
>
> Minn. R. 7849.0250C(7) – effect on rates systemwide;
>
> Minn. R. 7849.0250D – system map;
>
> Minn. R. 7849.0270 – peak demand and annual consumption forecast;
>
> Minn. R. 7849.0280 – system capacity;
>
> Minn. R. 7849.0290 – conservation programs;
>
> Minn. R. 7849.0300 – consequences of delay; and
>
> Minn. R. 7849.0340 – alternative of no facility.

See Dept. of Commerce Comments at 3-4. The Department of Commerce recommended that Calpine address, at least in general terms, the following two data requirements: Minn. R. 7849.0250B(1) requiring a discussion of the alternative of purchased power; and Minn. R. 7849.0250B(3) requiring a discussion of the alternative of new transmission lines.

With regard to Calpine's request for clarification of the scope of data required in its application, the Department of Commerce: (1) concluded that the certificate of need proceeding should focus on the incremental impact of the addition of a wholesale power element of the plant, which was selected in an approved all-source bidding process; and (2) recommended the Commission clarify that the scope of data required from Calpine is limited to the incremental impact of the claimed need to address the wholesale market on Calpine's proposed plant.

II. REPLY TO COMMENTS

A. Data Exemptions

The Commission may grant data exemptions to Certificate of Need applicants where such data is either unnecessary to determine the need for the proposed facility or could be satisfied by submittal of another document. Minn. R. 7849.0200, subp. 6. In practice, the Commission has granted exemptions to independent power production plants where the data required could not readily be obtained, was inapplicable to a power generator not regulated as a utility, or was not necessary to determine need. See, e.g., Docket No. IP-4/CN-01-1306 (In re Rapids Power LLC). The Department of Commerce recognized that Calpine is not a regulated utility and neither purchases power nor does it build or operate transmission lines. The Department of Commerce concluded, however, that Calpine should still address these points in its application because it was not clear that the reasons stated by Calpine for its exemption were reasonable grounds.

Calpine views the Department of Commerce's statements with regard to the exemptions from Minn. R. 7849.0250B(1) and Minn. R. 7849.0250B(3) to be distinctions without differences. If, as the Department of Commerce suggests, Calpine might adequately answer the data requirements by addressing them only "in general terms," one is left to question why they must be answered at all. Implicitly, the Department of Commerce recognizes that the data requirements are not applicable to Calpine's unique situation. Any general information Calpine might provide in regard to these data requirements would likely be either vague, theoretical, attenuated, or unhelpful to the Commission's determination of the need for the project.

As further support for its belief that it should not be required to provide information on the data requirements set forth in Minn. R. 7849.0250B(1) and B(3), Calpine sets forth the following addition arguments. First, Calpine acknowledges that a discussion of alternatives will be included in its Certificate of Need application because it has not sought an exemption from

and would comply with Minn. R. 7849.0250B(4), which requires a discussion of new generating facilities of a different size or using a different energy source than the proposed facility. Second, Calpine notes that since exemptions are granted on a case-by-case basis, any decision applicable to Calpine will not set a standard for regulated utilities (or any other applicant whose situation is not identical to that presented by Calpine) that purchase power or operate transmission lines.

B. Scope of Data

The Department of Commerce also recommended that the scope of data required in the subsequent application for the Certificate of Need relate only to the incremental impact of the claimed need to address the wholesale market on Calpine's project. In making this recommendation, the Department of Commerce noted, correctly, that the natural gas line that will serve the Project will be "shared" by the exempted portion of the Project and the portion of the Project that will be the subject of Calpine's application for a Certificate of Need. To the extent that the Department of Commerce's recommendation acknowledges that the demonstration of need is limited to: (i) the wholesale power portion of the Project that is not subject to the statutory exemption for Commission-approved bidding process, i.e. the balance of power generated by the Project that is estimated to be approximately 255 MW, and (ii) the natural gas required to generate that power, Calpine has no objection.

III. CONCLUSION

Calpine respectfully requests the Commission grant its request for filing exemptions from the Certificate of Need requirements as proposed in its November 25, 2003, submittal and clarify the scope of the application as set forth in its submittal and above.

Respectfully submitted this 8th day of January, 2004.

CALPINE CORP.

By: B. Andrew Brown

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CERTIFICATE OF SERVICE

I hereby certify that on January 8, 2004, I served by local messenger the original and 15 copies of Calpine's Reply to Comments On Request for Exemption from Certain Data Filing Requirements, Docket No. IP-6345/CN-03-1884 and Certificate of Service upon the following person:

Dr. Burl W. Haar
Executive Secretary
MN Public Utilities Commission
Suite 350
121 East Seventh Place
St. Paul, MN 55101-2147

I hereby certify that on January 8, 2004, I transmitted via U.S. Mail the indicated number of copies to the following people a true and correct copy of Calpine's Reply to Comments On Request for Exemption from Certain Data Filing Requirements, Docket No. IP-6345/CN-03-1884 and Certificate of Service in a prepaid envelope addressed to:

Kathy Aslakson (4 copies)
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Wilda Wahpepah

Wilda Wahpepah

Subscribed and sworn to before me
this 8th day of January, 2004.

Myrna Maikkula
Notary Public

MYRNA MAIKKULA
NOTARY PUBLIC-MINNESOTA
My Commission Expires Jan. 31, 2005

Minnesota Public Utilities Commission

Staff Briefing Papers

Meeting Date: January 22, 2004 ..... Agenda Item #___

Company: Calpine Corporation

Docket No. IP-6345/CN-03-1884
In the Matter of the Application of Calpine Corporation for a Certificate of Need for a Large Electric Generating Facility

Issue(s): Should the Commission approve Calpine Corporation's Request for Exemption from Certain Data Filing Requirements and Order Establishing Scope of Application?

Staff: David Jacobson ..... (651) 297-4562
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Relevant Documents

Minn. Rules, parts 7849.0010 to 7849.0400
Calpine's Request for Exemption from Certain Data Filing Requirements and Order Establishing Scope of Application, filed November 25, 2003 ..... #1
Department of Commerce Comments, filed December 29, 2003 ..... #9
Calpine's Reply Comments, filed January 8, 2004 ..... #11

The attached materials are workpapers of the Commission Staff. They are intended for use by the Public Utilities Commission and are based upon information already in the record unless otherwise noted.

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Statement of the Issue

Should the Commission approve the Calpine Corporation's Request for Exemption from Certain Data Filing Requirements and Order Establishing Scope of Application?

Background Information

On November 25,2003, Calpine Corporation (Calpine or the Company) filed a request for exemption from certain certificate of need filing requirements and for an order establishing the scope of the application. The Company indicated its intent to file a certificate of need application for permission to construct a natural gas-fired combined cycle electric generating facility at a site near Mankato, Minnesota. The generating facility would be a large energy facility as defined by Minn. Stat. § 216B.2421, subd. 2 (1) (2002).

The operative certificate of need rules are Minn. Rules, parts 7849.0010 to 7849.0400.

In an earlier Order, the Commission extended the time period to review Calpine's exemption request and to notify the Company of its reasoning.

On December 2, 2003, the Commission issued a notice requesting comment on Calpine's exemption request. The initial comment and reply comment deadlines given in that notice were December 29, 2003 and January 8, 2004, respectively.

The Department of Commerce (Department) submitted comments on December 29, 2003. Calpine replied to the Department's comments on January 8, 2004.

Party Positions

Summary of Calpine's Project and Exemption Request

Calpine indicated its intent to construct a combined-cycle power plant capable of producing 630 megawatts (MW) of power. Natural gas would be the fuel of choice, with low-sulfur distillate oil as a back-up fuel. The facility would include two combustion turbine generators, two heat recovery steam generators equipped with duct burners, one steam turbine with an associated heat rejection system, and various other equipment. The proposed 25-acre site is north of the Mankato city limits within Lime Township. The site is approximately four miles from the Northern Natural Gas pipeline and only 1,500 feet from the Wilmarth Substation.

Calpine asked that it be exempted from certain data requirements that are not necessary to determine the need for an independent power production facility. The Company also requested that the Commission establish that the scope of the application (and the proceeding) be limited to the power generated for the wholesale market, excluding consideration of the power production already certified through a Commission-approved resource plan solicitation.

Calpine noted that it has committed to supply approximately 375 MW to Northern States Power through the bidding process approved by the Commission in that utility's resource planning process. As indicated by the Company, an electric power plant selected in a bidding process approved by the Commission is exempt from the certificate of need process.[1] The Company stated that the balance of power generated by the facility would be offered for sale to wholesale customers, including utilities in Minnesota. The planned in-service date is 2006.

Calpine noted that the Commission has granted exemptions to independent utility generators in several cases where required data could not be obtained, was inapplicable to a non-utility generator, or was not necessary to determine need. The Company added that the Commission has recognized that some of the ratemaking and other concerns related to construction by utilities are not relevant to non-regulated entities assuming all of the commercial and technical risks.

Calpine noted that it has neither an assigned service area or a "system," as the term in used in the rules. Its ultimate customers are not end-user customers. As a result, the Company argued, certain information required by the rules is either non-existent or not relevant to the application and therefore not necessary to determine the need for an independent power producer's project.

Accordingly, Calpine requested exemptions from the following data requirements, for the reasons given:

- Part 7849.0250, items B (1) to B (3) (Alternatives) – Calpine indicated that it is not in the business of purchasing power, that it has no existing generation facilities in Minnesota to which efficiency improvements could be applied, and that does not own or operate transmission facilities in Minnesota. Further, the Company indicated it could not readily obtain data for facilities operated by others. The Company stated that it proposes to discuss facility size and fuel type issues, in addition to efficient operation of its proposed facility.

- Part 7849.0250, item C (7) (Facility's Effect on Rates Systemwide) – Calpine stated that it does not have a system or regulated rates. The Company proposed instead to submit data on its project's impact on state or regional wholesale prices.

- Part 7849.0250, item D (System Map) – Calpine indicated that it does not have a system as defined by the rules and therefore cannot provide a map of its system. However, the Company added that it would provide a map showing the proposed site and its location relative to the power grid and the natural gas pipeline.

- Part 7849.0270 (Peak Demand and Annual Consumption) – Calpine stated that it cannot provide forecast data for its system, since it doesn't have one. The Company added that it cannot reasonably forecast peak demand for its potential customers. However, Calpine

[1] See Minn. Stat. § 216B.2422, subd. 5.

proposed to submit regional demand, consumption, and capacity data from credible sources to show the need for the energy it would generate.

- Part 7849.0280 (Ability of Existing System to Meet Electrical Demand) – Calpine indicated it does not have a system as defined by the rules. As indicated previously, the Company proposed instead to submit regional demand, consumption, and capacity data from credible sources to show the need for the energy it would generate.

- Part 7849.0290 (Energy and Conservation Plans) – Calpine stated that end-use conservation does not have the same meaning for a wholesale supplier as it does for a utility with end-use customers. The Company indicated that the information requested by this rule would be "essentially unhelpful" to the Commission's need determination.

- Part 7849.0300 (Effect of Delay on Systems and Power Pool) – Calpine indicated that the requirement of this rule is inapplicable to the Company because it does not have a system. Calpine proposed instead to submit data on the consequences of delay to its potential customers and to the region.

- Part 7849.0340 ("No Facility" Requirement) – Calpine stated that the rule is not directly applicable since the Company does not have a system as defined by the rules. The Company proposed instead to submit data reasonably available to it regarding the impact on the wholesale market of the no-facility alternative.

- Part 7849.0240, subp. 2, item B (Relationship to Promotional Activities) – Calpine indicated that the Commission has in the past recognized that information in response to this requirement is not necessary to determine the need for an independent power producer's project because the proponent has not engaged in any promotional activities and lacks data to report. Calpine therefore requested exemption from this requirement in its entirety.

Calpine also requested that the Commission establish by Order that the scope of data required in the application relates only to demonstrating the need for the power that the proposed facility would generate for the wholesale market and the additional facilities associated with supplying that power.[2]

Comments of the Department of Commerce

The Department recommended that Calpine's request be approved with modifications. The Department indicated that the Commission should approve each of the Company's proposed

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[2]Calpine indicated that the additional facilities the Company would need to generate that power would be one combustion turbine generator and one heat recovery steam generator. All other machinery and equipment associated with the supply of the wholesale market portion would be shared with the portion of output associated with the statutory exemption.

Staff Analysis

Minn. Rules, part 7849.0200, subp. 6 indicates that the Commission shall grant an exemption from an application requirement rule if the data requirement is unnecessary to show the need for the proposed facility or may be satisfied by submission of another document.

Staff generally agrees with Calpine and the Department that exemptions from current rule requirements are appropriate for non-utility entities. Staff notes the Company's objection to providing data for two types of alternatives--transmission lines and purchased power. The Department suggested that the Company address those alternatives "in general terms." The scope of detail required for alternatives is an issue in virtually every certificate of need application. Since the need and environmental statutes emphasize the importance of consideration of alternatives, staff generally believes it is appropriate to err on the side of too much consideration, rather than too little. Calpine undoubtedly has a level of knowledge of the industry that would allow it to provide a response as suggested by the Department. The accuracy and importance of those comments can be evaluated during the course of the certificate of need proceeding. Staff therefore believes the Department's recommendation can be accepted in its entirety, with the qualifications described below.

Calpine has also requested that the Commission limit by Order the scope of the application to only the part of the equipment and machinery that is not exempt. While it generally agrees with the spirit of the arguments by the Company and the Department, staff notes that the Commission certifies facilities, not megawatt levels or parts of facilities. It is conceptually difficult to consider only a part of a proposed facility. The Company should recognize that it may be necessary to discuss the equipment and machinery needed to supply 375 MW to NSP to gain a full appreciation of the project. That is, any Order from the Commission limiting the scope of the data and the proceeding should not be construed as sufficient reason to refuse reasonable requests for information related to the entire project.

Perhaps of even greater consequence is the fact that Calpine's status as qualifying for an exemption under § 216B.2522, subd. 5 (b) has not been confirmed. For example, a contract has not been submitted for approval in Docket No. E-002/M-01-1618. Calpine probably would not proceed with the generation project near Mankato if a contract were not signed. However, staff believes that it would be appropriate for the Commission to consider any certificate of need as conditional until a contract is approved in the all-source docket. Since Calpine's instant filing is dependent on those future actions, staff suggests that the Commission note the conditional nature of any scope ruling in its Order responding to the Company's November 25 filing.

Staff understands that this situation presents somewhat of a problem for the Company. Certainly, the Commission should not put Calpine in a Catch-22 situation where it cannot obtain a contract without a certificate of need or obtain a certificate of need without a contract. Rather, staff believes the Commission should allow the Company to proceed on dual tracks, i.e., by pursuing a contract at the same time it pursues a certificate of need.

Decision Options and Staff Recommendation

In response to this issue, the Commission could:

1. approve Calpine's request in its entirety but with the qualifications suggested above in the staff discussion;

2. approve Calpine's request as modified by the Department but with the qualifications suggested above in the staff discussion; or

3. make some other decision deemed more appropriate than the previous two alternatives.

Staff recommends that the Commission select alternative #2.

Appendix B

Project Cost

[TRADE SECRET DATA BEGINS

TRADE SECRET DATA ENDS]

Appendix C

Facility Needs Documentation

Reliability Assessment

2003–2012

The Reliability of
Bulk Electric Systems
in North America

North American Electric Reliability Council
December 2003

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Executive Summary

Introduction

The North American Electric Reliability Council's (NERC) Reliability Assessment Subcommittee (RAS) prepared this independent report, which includes:

- an assessment of the long-term electric supply and demand and transmission reliability through 2012,
- a discussion of key issues affecting reliability of future electric supply and transmission, and
- regional assessments of electric supply reliability, including issues of specific regional concern.

Although the assessment represents a fairly accurate forecast of future conditions for the first several years, the longer-term assessment must be considered more an indication of future trends rather than an absolute evaluation.

In preparing this report, RAS:

- reviewed summaries of regional self-assessments, including forecasts of electric peak demand, electric energy requirements, and planned resources;
- appraised regional plans for new electric generation resources and transmission facilities; and
- assessed the potential effects of changes in technology, market forces, legislation, regulations, and governmental policies on the reliability of future electricity supplies.

August 14th Blackout

The largest blackout in North America's history occurred on August 14, 2003. In its interim report, the U.S./ Canada Power System Outage Task Force investigating the blackout concluded, and NERC concurred, that certain control areas and reliability coordinators failed to fully comply with existing NERC reliability standards, and that this failure contributed to the blackout.

NERC believes that actions must be taken immediately to ensure that the reliability of the bulk power system in North America is not compromised by deficiencies in the procedures, processes, personnel, tools, and training of control areas and reliability coordinators, or by their failure to comply with NERC and regional reliability standards.

As a first step, NERC sent a letter to each entity in North America that operates a control area and each NERC reliability coordinator asking them to certify that their organizations are operating within NERC and Regional Reliability Council standards and established good utility practices. Further details regarding the letter can be found on page 12 of this report.

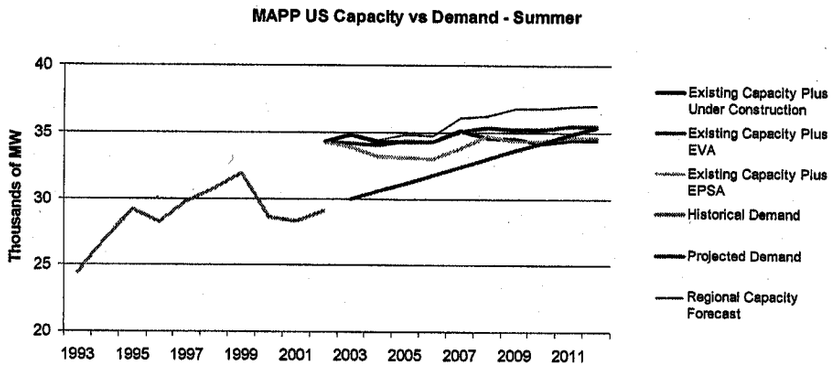
NERC is developing a comprehensive program to address the deficiencies identified in the interim report. The task force expects to issue a final report and recommendations in January 2004. NERC will take additional steps to address the findings of the investigation at that time.

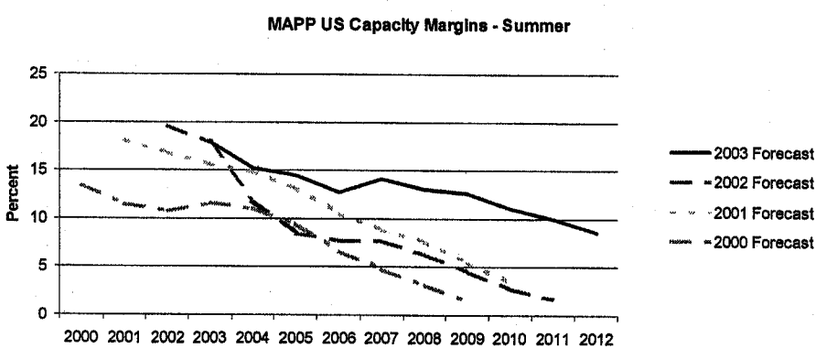
Resource Adequacy Satisfactory in Near Term

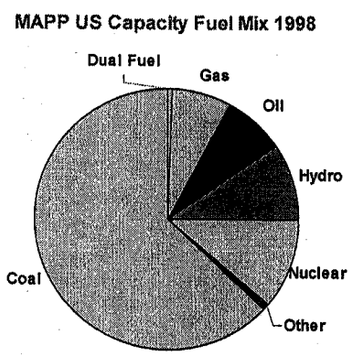
Resource adequacy will be satisfactory in the near term (2003–2007) throughout North America, provided new generating facilities are constructed as anticipated. In spite of this favorable outlook, there is always the chance that an excessive number of equipment problems, coupled with high demands caused by extreme weather, could create supply problems.

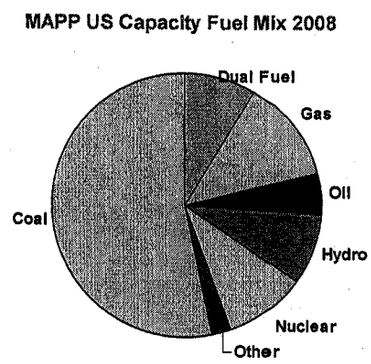
Electricity demand is expected to grow by about 67,000 MW in the near term. Projected resource additions over this same period total about 89,000 MW, depending upon the number of merchant plants assumed to be in service. Even though overall resources appear adequate, generation additions and resulting capacity margins are not evenly distributed across North America, as shown in the *Resource Adequacy* section of this report.

MAPP-U.S. Capacity and Demand









MAPP

For the period 2006–2012, currently projected capacity reported in the Mid-Continent Area Power Pool (MAPP) U.S. region is below MAPP requirements for reserve capacity obligations, but MAPP does not expect any capacity deficits to occur during the next ten years. MAPP-U.S. utilities have committed to provide an additional 2,700 MW of new generation during this period. Most utilities in the region propose to install natural gas-fired combustion turbines with short construction lead time to meet capacity obligations.

The MAPP transmission systems are adequate to meet the committed needs of the member systems and will continue to meet reliability criteria throughout the period. The system is expected to be highly utilized due to continuing power marketing activity, and is expected to be managed within its secure limits, which may not meet all market needs.

Demand

The MAPP-U.S. and MAPP-Canada combined 2002 summer non-coincident peak demand was 34,632 MW, a 5.2% increase over 2001 (32,912 MW), and 4.0% above the 2002 forecast (33,285 MW).

MAPP-Canada was 8.2% above the 2001 actual demand and 2.9% above the 2002 forecast.

MAPP-U.S. was 4.7% above 2001 actual demand and 4.3% above the 2002 forecast. The MAPP-U.S. summer peak demand is expected to increase at an average rate of 1.8% per year during the 2003–2012 period, as compared to 1.9% predicted last year for the 2002–2011 period. The MAPP-U.S. 2011 non-coincident summer peak demand is projected to be 34,811 MW. This projection is 5.4% above the 2011 non-coincident summer peak demand predicted last year.

Annual electric energy usage for MAPP-U.S. in 2002 (150,058 GWh) was 3.6% above 2001 consumption and 1.7% above the 2002 forecast.

Resources

Generating resources for MAPP-Canada are forecast to be adequate over the ten-year period. Current planned capacity reported in the MAPP-U.S. region is below MAPP requirements for reserve capacity obligation during 2006–2012. The MAPP Restated Agreement obligates the member systems to maintain reserve margins at or above 15%, which is equivalent to a 13.04% minimum capacity margin requirement. The summer capacity reserve margin is forecast to decline from a high of 17.9% in 2003 to 12.7% in 2006 and 8.5% in 2012. MAPP-U.S. will provide an additional 2,700 MW of new generation for the period of 2003–2012 as reported in the EIA-411.

However, the *MAPP Regional Plan* has reported over 6,600 MW of new generation for the period of 2002–2011, 3,900 MW above that reported to NERC in the EIA-411.[6] This discrepancy between the *MAPP Regional Plan* and the EIA-411 data may be due to the fact that members may not have reported merchant or other generation not yet sited through the data collection process used to prepare the NERC assessment report. Therefore, for the next ten-year period, the MAPP capacity margins are likely to be higher than those shown above.

Although the region planned capacity reported in the MAPP-U.S. region is below MAPP requirements for reserve capacity obligation, MAPP believes that no capacity deficit will occur during the next ten-year period because MAPP has requirements for reserve capacity obligation with financial penalty and continually monitors the members' reserve margins. This mechanism would ensure that the members plan for adequate capacity to meet their expected demand.

[6] The *MAPP Regional Plan* is updated biennially.

Transmission

The existing transmission system within MAPP-U.S. is comprised of 7,240 miles of 230 kV, 5,742 miles of 345 kV, and 343 miles of 500 kV transmission lines. MAPP-U.S. members plan to add 690 miles of 345 kV and 283 miles of 230 kV transmission in the 2002–2011 timeframe. The MAPP-Canada existing transmission system is comprised of 4,578 miles of 230 kV and 130 miles of 500 kV transmission lines. MAPP-Canada is planning for an additional 267 miles of 230 kV transmission in the 2002–2011 timeframe. MAPP-U.S. and Canada have a total of 2,030 miles of HVDC lines.

MAPP members continue to plan for a reliable transmission system. Coordination of expansion plans in the region takes place through joint model development and study by the Regional Transmission Committee. This committee includes transmission owning members, transmission using members, power marketers, and state regulatory bodies. The Transmission Planning Subcommittee, in cooperation with the subregional planning groups, has prepared the *MAPP Regional Plan* 2002 to 2011, to address the needs of all stakeholders. In addition to the transmission planning process conducted through the MAPP Regional Transmission Committee, MAPP members are participating in the MISO transmission expansion planning process.

In general, the MAPP transmission system is judged to be adequate to meet firm obligations of the member systems provided that the local facility improvements identified in the ten-year transmission plan are implemented. MAPP continues to monitor the 19 flow gates within the region to maintain reliability during MAPP exports.

Import restrictions for nonfirm energy in eastern Iowa are due to thermal limitations that include both MAPP and non-MAPP facilities. Proposed upgrades to the Poweshiek-Reasnor 161 kV line have been identified as one reinforcement that would reduce the import restrictions. Outages of 345 kV tie lines connecting the Twin Cities metropolitan area of Minneapolis-St. Paul to the Iowa and Wisconsin regions are continuing to result in system stability restrictions that limit energy transfers from the Twin Cities to Iowa and Wisconsin. The Arrowhead-Weston 345 kV transmission line has been identified as a significant reinforcement to improve the overall performance of this interface. The proposed line is expected to be in service in 2008.

At times, high levels of power marketing activity are expected to fully utilize the available capacity within the existing transmission system. Consequently, MAPP members continue to take a proactive role in the planning and operation of the system in a secure and reliable manner.

Operations

The MISO as MAPP's reliability coordinator is fully operational, with the implementation of real-time system monitoring of key flow gates, data collection at five-minute intervals, and near real-time pre-contingency analyses of system conditions. MAPP member systems jointly perform interregional and intraregional seasonal operating studies under the direction of the Transmission Operations Subcommittee to coordinate real-time operations. Subregional operating review working groups have been formed to deal with day-to-day operational issues such as unit outages and schedule transmission system maintenance. The MAPP Reserve Sharing Pool continues to provide a benefit to the region through the sharing of generation reserves during system emergencies.

Assessment Process

The MAPP Reliability Council, Regional Reliability Committee, and the Regional Transmission Committee direct the annual assessment of adequacy and operating reliability through the working group structure. The Transmission Reliability Assessment and Composite System Reliability Working Groups jointly prepare the MAPP ten-year regional reliability assessment. The Reliability Studies, Design Review, and Transmission Operations and Planning Subcommittees are committed to reviewing MAPP reliability from near-term and long-term perspectives to ensure the MAPP system can meet the needs of its members.

MAPP membership includes 108 utility and non-utility systems. MAPP covers all or portions of Iowa, Illinois, Minnesota, Nebraska, North and South Dakota, Michigan, Montana, Wisconsin, and the provinces of Manitoba and Saskatchewan. The total geographic area is 900,000 square miles with a population of 18 million.
www.mapp.org

2003/2004 WINTER ASSESSMENT

Reliability of the Bulk Electricity Supply in North America

North American Electric Reliability Council

November 2003

MAPP

Demand

The expected winter noncoincident peak demand in combined MAPP-U.S. and MAPP-Canada is 30,908 MW. That is 2.7% above last winter's peak forecast of 30,098 MW and 2.1% above last winter's actual peak demand. The load forecast assumes average weather conditions.

Projected Internal Demand	30,604 MW
Interruptible Demand & DSM	836 MW
Projected Net Internal Demand	29,768 MW
Last Winter's Peak Demand	30,098 MW
% Change	1.7 %
All-Time Winter Peak Demand	31,255 MW
Net Operable Capacity & IPP's	41,758 MW
Projected Purchases	4,500 MW
Projected Sales	4,330 MW
Net Capacity Resources	41,934 MW
Capacity Margin	29.0 %
Reserve Margin	40.9 %

Resources

The projected MAPP capacity margin is 29.0%. The MAPP Reserve Capacity Obligation requirement is 15%, which is equivalent to a 13.04% capacity margin requirement. This also compares to the 2002/2003 winter capacity margin of 27.3%. Capacity additions for winter 2003/2004 are 83 MW, consisting of gas turbines and internal combustion turbines.

There is a projected net capacity import into the MAPP Region. There are 2,916 MW of firm purchases planned between MAPP members and from entities outside of the MAPP Region. There are 1,345 MW of firm sales planned from MAPP members and to entities out of the MAPP Region.

There are no fuel limitations anticipated in the region that would impact resource adequacy for winter 2003/04.

Transmission

MAPP reliability coordinators continue to monitor the 18 transmission constraints within the region that can limit MAPP imports and exports.

The reliability of the MAPP transmission system is currently measured by determining the thermal, voltage, and dynamic stability limitations, and by studying transmission system historical performance. MAPP members regularly conduct studies that provide an indication of transmission system strength, and the necessary data to facilitate expansion analyses of the MAPP network. MAPP continues to place emphasis on voltage security and stability analysis due to export considerations from the North Dakota area.

These studies indicate that the MAPP transmission system is adequate to meet firm obligations of the member systems for this coming winter season.

Operations

No operational issues are expected for the transmission system within the region during the winter season. There are no anticipated environmental or regulatory restrictions that will curtail availability of transmission system during the winter season.

Subregions

Iowa

No major operational issues are expected in Iowa for the winter season. In the event that heavy power transfers cause operational problems, existing standing operating guides for the Iowa constrained interfaces will be implemented. These standing guides have proven to be effective dealing with this operating condition in the past.

In addition, two generators at the Greater Des Moines Energy Center, which became operational during summer 2003, should provide better operational control of heavy east-to-west power transfers across Iowa.

A number of bulk transmission outages are scheduled in the northern MAPP Region for maintenance into the late fall and early winter; however, no operating problems are expected. Temporary operating guides will be developed as necessary. Several additional small 20–40 MW sized wind farms are scheduled to come on line just prior to or during this winter season in northern MAPP.

MID-CONTINENT AREA POWER POOL

LOAD AND CAPABILITY

REPORT

July 1, 2003
FINAL DRAFT

Approved by AWG
July 1, 2003

QUESTIONS REGARDING THIS REPORT MAY BE DIRECTED TO:

MID-CONTINENT AREA POWER POOL
MAPP Center
1125 Energy Park Dr.
St. Paul, MN 55108-5001
(651) 632- 8400

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INTRODUCTION

Section I

GENERAL COMMENTS

The MAPP Load and Capability Report May 2003 is prepared in response to the requirement set forth in the MAPP Agreement and the MAPP Reliability Handbook for a two-year monthly and a ten-year seasonal load and capability forecast from each MAPP Participant. The report contains forecasts of monthly load and capability data for the period of May 2003 through December 2005 and seasonal load and capability data for the ten-year period Summer 2003 through Summer 2012.

The information in the report is dated May 31, 2003 and is prepared in conjunction with the May 1, 2003 MAPP Regional Reliability Council Report on Coordinated Bulk Power Supply Program (EIA-411) submitted to the North American Electric Reliability Council.

MAPP RELIABILITY COUNCIL

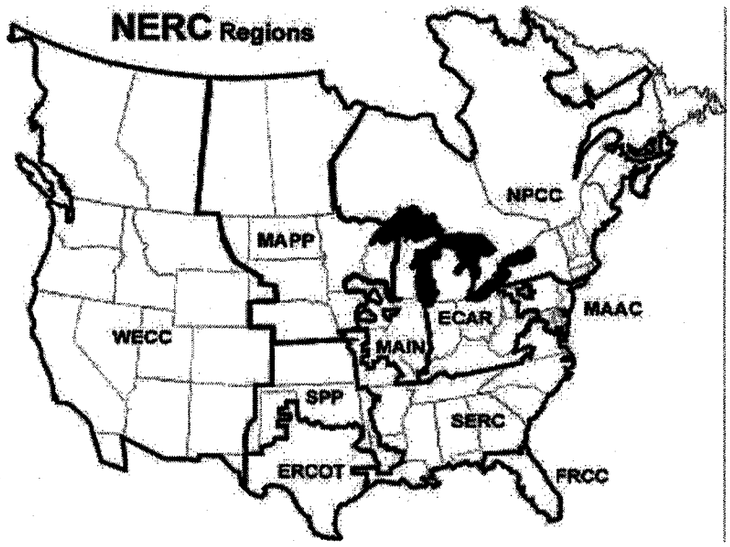
The Mid-Continent Area Power Pool (MAPP) is one of the nine regional reliability councils comprising the North American Electric Reliability Council (NERC). The MAPP region covers all of the states of Minnesota, Nebraska, North Dakota, most of South Dakota, and portions of the states of Iowa, Illinois, Michigan, Missouri, Montana and Wisconsin. The Canadian provinces of Manitoba and Saskatchewan are included in the MAPP region as well. The region is outlined on the map of the NERC regional councils on page I-4.

MAPP oversees the planning and operating activities in the region with respect to reliability. MAPP membership now totals 108 members and includes 14 transmission-owning members, 48 transmission-using members, 77 Power and Energy Market members, 18 associate members, and 8 regulatory participants. Two of the municipal utilities, IAMU and MMUA, are Joint Members and each contains 4 End-Use Load reporting members. Manitoba Hydro is a Member and Saskatchewan Power Corporation is an Associate Member of MAPP.

Information pertaining to the electrical utilities within the MAPP region that are Associate Members of MAPP or non-MAPP members and to the non-utility generators in the MAPP region is incorporated in the report as appropriate. Information about non-utility generators was supplied through inquiries to and responses by MAPP Members, MAPP Associate Members, and non-MAPP member electric utilities in the MAPP region.

This overview of regional planning is a compilation of each Member's load forecasts, planned new facilities and the resulting generating capacity and reserves. The overall projected system is tested periodically according to criteria contained in the MAPP System Design Standards. These standards include a set of contingencies referred to as probable disturbances. The overall system must be capable of withstanding these disturbances without interruption of load due to instability or cascading. Another set of contingencies is referred to as extreme disturbances. The system is designed to minimize the spread of any interruption that might result from such extreme disturbances. These procedures provide the basis for reporting on advance planning in this document. Similarly, the overview of operating activities based upon System Operating Standards provides the basis for the operating data contained in this document.

North American Electric Reliability Council

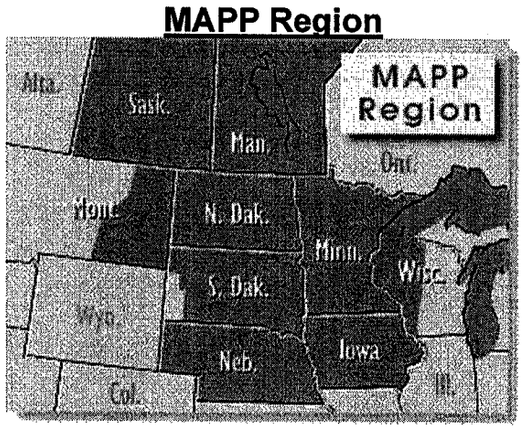


ECAR	East Central Area Reliability Coordination Agreement
ERCOT	Electric Reliability Council of Texas
FRCC	Florida Reliability Coordinating Council
MAAC	Mid-Atlantic Area Council
MAIN	Mid-America Interconnected Network
MAPP	Mid-Continent Area Power Pool
NPCC	Northeast Power Coordinating Council
SERC	Southeastern Electric Reliability Council
SPP	Southwest Power Pool
WECC	Western Electricity Coordinating Council

Affiliate

ASCC	Alaska Systems Coordinating Council

MAPP Region



MID-CONTINENT AREA POWER POOL

REPORTING SYSTEMS

SYSTEM NAME	INITIALS
Algona Municipal Utilities (1)	ALGN
Ames Municipal Electric System	AMES
Atlantic Municipal Utilities (1)	ATL
Basin Electric Power Cooperative	BEPC
Central Minnesota Municipal Power Agency (2)	CMMPA
GEN~SYS Energy (DPC)	GSE
Great River Energy (CP & UPA)	GRE
Harlan Municipal Utilities (1)	HMU
Hastings Utilities	HSTG
Heartland Consumers Power District	HCPD
Hutchinson Utilities Commission (2)	HUC
Lincoln Electric System	LES
Marshall Municipal Utilities	MMU
MidAmerican Energy Company/ Corn Belt Power Cooperative/ Cedar Falls Municipal Utilities/ City of Indianola/ Montezuma Municipal Electric Utilities/ Estherville Ia./ Waverly Ia./North Iowa Municipal Electric Cooperative Association	MEC
Minnesota Municipal Power Agency	MMPA
Minnesota Power	MP
Minnkota Power Cooperative Inc.	MPC
Missouri River Energy Services	MRES
Montana-Dakota Utilities Co.	MDU
Municipal Energy Agency of Nebraska	MEAN
Muscatine Power & Water	MPW
Nebraska Public Power District	NPPD
New Ulm Public Utilities (2)	NULM
Northwestern Public Service Company	NWPS
Omaha Public Power District	OPPD
Otter Tail Power Company	OTP
Pella Municipal Power and Light Department (1)	PELLA
Rochester Public Utilities	RPU
Southern Minnesota Municipal Power Agency	SMMPA
Western Area Power Administration – Upper Great Plains Region	WAPA
Willmar Municipal Utilities (2)	WLMR
Wisconsin Public Power Inc.	WPPI
Xcel Energy	XCEL
Manitoba Hydro	MHEB
SaskPower	SPC

(1) Joint Member through Iowa Association of Municipal Utilities (IAMU)
(2) Joint Member through Minnesota Municipal Utilities Association (MMUA)

EXPLANATION OF CODES – Section IV

I. UNIT TYPES

CA	Combined Cycle Steam Turbine Portion
CC	Combined Cycle Total Unit
CE	Compressed Air Energy Storage
CT	Combined Cycle Combustion Turbine Portion
CS	Combined Cycle Single Shaft
FC	Fuel Cell
GT	Combustion (Gas) Turbine (includes jet engine design)
HY	Hydraulic Turbine - Conventional
IC	Internal Combustion (piston)
NA	Unknown at this time
OT	Other (describe in "notes")
PS	Hydraulic Turbine - Pumped Storage
PV	Photovoltaic
ST	Steam Turbine, including nuclear, geothermal, and solar steam
WT	Wind Turbine

II. FUEL TYPES

BFG	Blast-Furnace Gas
BIT	Bituminous
DFO	Distillate Fuel Oil
GEO	Geothermal
JF	Jet Fuel
KER	Kerosene
LFG	Landfill Gas
LIG	Lignite
MSW	Municipal Solid Waste
NA	Not Available
NG	Natural Gas
NUC	Nuclear (Uranium, Plutonium, Thorium)
OBG	Other Biomass Gases
OBL	Other Biomass Liquids
OBS	Other Biomass Solids
OG	Other Gas
PC	Petroleum Coke
PG	Propane
RFO	Residual Fuel Oil
SUB	Sub bituminous
SUN	Solar
WAT	Water
WC	Waste/Other Coal
WDL	Wood Waste Liquids
WDS	Wood/Wood Waste Solids
WH	Waste Heat (reject heat)
WND	Wind
WO	Oil – Other than Waste Oil

EXPLANATION OF CODES – Section IV

III. STATUS CODES

Utility Units:

OP	Operating, available to operate, or on short-term scheduled or forced outage (less than three months).
OS	On long-term scheduled (maintenance) or forced outage; not available to operate (greater than three months).
SB	Cold standby (Reserve): deactivated (mothballed), in long-term storage and cannot be made available for service in a short period of time, usually requires three to six months to activate.
RE	Retired (no longer in service and not expected to be returned to service).
A	Generating unit capability increased (rerated or relicensed)
CO	Proposed Change of Ownership
D	Generating unit capability decreased (rerated or relicensed)
FC	Existing generator planned for conversion to another fuel or energy source
IP	Planned generator indefinitely postponed or canceled
L	Regulatory approval pending. Not under construction (started site preparation).
M	Generating unit put in deactivated shutdown status
OT	Other (describe under "notes")
P	Planned for installation but not utility-authorized. Not under construction.
RA	Previously deactivated or retired generator planned for reactivation
RP	Proposed for repowering or life extension
RT	Existing generator scheduled for retirement
T	Regulatory approval received but not under construction.
TS	Construction complete, but not yet in commercial operation (including low power testing of nuclear units).
U	Under construction, less than or equal to 50% complete (based on construction time to first electric date).
V	Under construction, more than 50% complete (based on construction time to first electric date).

FORECASTED SEASONAL LOAD & CAPABILITY
MEGAWATTS

MAPP-US

		SUM 2003	WIN 2003	SUM 2004	WIN 2004	SUM 2005	WIN 2005	SUM 2006	WIN 2006	SUM 2007	WIN 2007
1	Internal Demand in MW (3-2)	29972	24179	30572	24567	31173	24965	31780	25380	32429	25790
2	Standby Demand	0	0	0	0	0	0	0	0	0	0
3	Total Internal Demand	29972	24179	30572	24567	31173	24965	31780	25380	32429	25790
4	Direct Control Load Management	74	346	75	357	76	348	78	338	79	329
5	Interruptable Demand	1259	220	1273	220	1311	220	1338	220	1368	220
6	Net Internal Demand (3-4-5)	28639	23613	29224	23990	29786	24397	30364	24822	30982	25241
7	Schedule L Purchases	220	475	220	485	220	475	220	465	220	455
8	Committed Resources (9+10+11+12)	32194	32646	32267	32636	32275	32642	32269	32643	32319	32693
9	Distributed Generator Capacity (1 MW or greater)	3566	3309	3576	3311	3584	3311	3584	3312	3584	3312
10	Other Capacity (1 MW or greater)	28434	29264	28497	29252	28477	29262	28475	29261	28525	29311
11	Distributed Generator Capacity (less than 1 MW)	10	8	10	8	10	8	10	8	10	8
12	Other Capacity (less than 1 MW)	184	64	184	64	204	61	201	61	201	61
13	Uncommitted Resources	500	608	640	971	1067	1182	1079	1224	2208	2375
14	Total Capacity (8+13)	32694	33254	32907	33607	33341	33824	33348	33867	34527	35068
15	Inoperable Capacity	0	7	0	0	0	0	0	0	0	0
16	Net Operable Capacity (14-15)	32694	33247	32907	33607	33341	33824	33348	33867	34527	35068
17	Total Capacity Purchases	6132	3935	5043	3310	3969	3127	3777	3034	3745	2990
18	Full Responsibility Purchases (Firm)	1731	2366	1654	2223	1618	2186	1623	2192	1569	2145
19	Participation Purchases	4401	1568	3389	1086	2351	941	2154	842	2176	845
20	Total Capacity Sales	3946	3521	3491	2755	2515	2671	2381	2531	2223	2504
21	Full Responsibility Sales	1513	1345	1418	1330	1319	1312	1329	1261	1274	1195
22	Participation Sales	2433	2176	2073	1425	1196	1359	1052	1270	949	1310
23	Adjustment for Remotely Located (totally owned or shared) Generating Unit(s)	6	6	6	6	6	6	6	6	6	6
24	Planned Capacity Resources (16+17+23-20)	34886	33667	34465	34168	34802	34286	34750	34377	36055	35560
25	Adjusted Net Capability (14+19+23-22)	34668	32653	34229	33274	34503	33412	34456	33446	35760	34610
26	Annual System Demand	29933	29693	30514	30238	31097	30791	31668	31399	32336	32046
27	Monthly Adjusted Net Demand (6-7-18+21)	28421	22592	28988	23096	29487	23523	30070	23891	30686	24291
28	Annual Adjusted Net Demand (26-18+21)	29715	28672	30278	29344	30798	29917	31374	30468	32041	31096
29	Net Reserve Capacity Obligation (28 x 15%)	4358	4208	4442	4309	4520	4395	4607	4478	4707	4572
30	Total Firm Capacity Obligation (27+29)	32779	26817	33430	27422	34007	27940	34677	28391	35393	28886
31	Surplus or Deficit(-) Capacity (25-30)	1889	5836	799	5852	496	5472	-221	5055	367	5724

SUMMER: MAY 1 - OCT 31; WINTER: NOV 1 - APR 30

FORECASTED SEASONAL LOAD & CAPABILITY
MEGAWATTS

MAPP-US

		SUM 2008	WIN 2008	SUM 2009	WIN 2009	SUM 2010	WIN 2010	SUM 2011	WIN 2011	SUM 2012
1	Internal Demand in MW (3-2)	33038	26179	33656	26572	34245	26957	34828	27334	35398
2	Standby Demand	0	0	0	0	0	0	0	0	0
3	Total Internal Demand	33038	26179	33656	26572	34245	26957	34828	27334	35398
4	Direct Control Load Management	80	320	81	331	82	342	84	353	85
5	Interruptable Demand	1388	220	1407	220	1426	220	1445	220	1462
6	Net Internal Demand (3-4-5)	31570	25639	32168	26021	32736	26395	33299	26761	33850
7	Schedule L Purchases	220	445	220	455	220	465	220	475	220
8	Committed Resources (9+10+11+12)	32320	32693	32920	33293	32920	33274	32901	33274	32893
9	Distributed Generator Capacity (1 MW or greater)	3585	3312	3585	3312	3585	3293	3566	3293	3566
10	Other Capacity (1 MW or greater)	28525	29311	29125	29911	29125	29912	29125	29911	29117
11	Distributed Generator Capacity (less than 1 MW)	10	8	10	8	10	8	10	8	10
12	Other Capacity (less than 1 MW)	201	61	201	61	201	61	201	61	200
13	Uncommitted Resources	2208	2375	2508	2675	2508	2675	2508	2675	2508
14	Total Capacity (8+13)	34528	35068	35428	35968	35428	35949	35409	35949	35401
15	Inoperable Capacity	0	0	0	0	0	0	0	0	0
16	Net Operable Capacity (14-15)	34528	35068	35428	35968	35428	35949	35409	35949	35401
17	Total Capacity Purchases	3726	2998	3726	3105	3682	3007	3629	3022	3654
18	Full Responsibility Purchases (Firm)	1526	2152	1528	2160	1530	2167	1518	2181	1520
19	Participation Purchases	2200	845	2198	945	2152	840	2111	840	2134
20	Total Capacity Sales	1993	2405	2373	2709	2333	2592	2063	2388	2063
21	Full Responsibility Sales	1154	1155	1154	1159	1154	1165	1079	1091	1079
22	Participation Sales	839	1250	1219	1550	1179	1427	984	1297	984
23	Adjustment for Remotely Located (totally owned or shared) Generating Unit(s)	6	6	6	6	6	6	6	6	6
24	Planned Capacity Resources (16+17+23-20)	36267	35667	36787	36371	36783	36371	36982	36589	36999
25	Adjusted Net Capability (14+19+23-22)	35895	34670	36413	35370	36407	35369	36542	35499	36557
26	Annual System Demand	32952	32658	33579	33246	34160	33817	34741	34379	35308
27	Monthly Adjusted Net Demand (6-7-18+21)	31198	24641	31794	25020	32360	25394	32859	25671	33409
28	Annual Adjusted Net Demand (26-18+21)	32579	31661	33204	32245	33784	32815	34301	33289	34867
29	Net Reserve Capacity Obligation (28 x 15%)	4788	4657	4881	4744	4968	4830	5046	4901	5131
30	Total Firm Capacity Obligation (27+29)	35985	29322	36675	29789	37328	30249	37905	30593	38539
31	Surplus or Deficit(-) Capacity (25-30)	-90	5348	-262	5581	-921	5120	-1363	4906	-1982

SUMMER: MAY 1 - OCT 31; WINTER: NOV 1 - APR 30

FORECASTED SEASONAL LOAD & CAPABILITY
MEGAWATTS

MAPP-Canada

		SUM 2003	WIN 2003	SUM 2004	WIN 2004	SUM 2005	WIN 2005	SUM 2006	WIN 2006	SUM 2007	WIN 2007
1	Internal Demand in MW (3-2)	5519	6729	5615	6812	5707	6925	5785	6995	5845	7080
2	Standby Demand	0	0	0	0	0	0	0	0	0	0
3	Total Internal Demand	5519	6729	5615	6812	5707	6925	5785	6995	5845	7080
4	Direct Control Load Management	0	0	0	0	0	0	0	0	0	0
5	Interruptable Demand	268	268	268	268	268	268	268	268	268	268
6	Net Internal Demand (3-4-5)	5251	6461	5347	6544	5439	6657	5517	6727	5577	6812
7	Schedule L Purchases	0	0	0	0	0	0	0	0	0	0
8	Committed Resources (9+10+11+12)	8913	8587	8913	8587	8913	8587	8913	8587	8913	8587
9	Distributed Generator Capacity (1 MW or greater)	0	0	0	0	0	0	0	0	0	0
10	Other Capacity (1 MW or greater)	8913	8587	8913	8587	8913	8587	8913	8587	8913	8587
11	Distributed Generator Capacity (less than 1 MW)	0	0	0	0	0	0	0	0	0	0
12	Other Capacity (less than 1 MW)	0	0	0	0	0	0	0	0	0	0
13	Uncommitted Resources	0	0	0	0	0	0	0	0	0	0
14	Total Capacity (8+13)	8913	8587	8913	8587	8913	8587	8913	8587	8913	8587
15	Inoperable Capacity	241	0	78	0	228	0	163	0	92	0
16	Net Operable Capacity (14-15)	8672	8587	8835	8587	8685	8587	8750	8587	8821	8587
17	Total Capacity Purchases	0	550	0	500	0	500	0	500	0	500
18	Full Responsibility Purchases (Firm)	0	550	0	500	0	500	0	500	0	500
19	Participation Purchases	0	0	0	0	0	0	0	0	0	0
20	Total Capacity Sales	1760	810	1510	810	1289	789	1289	789	1139	639
21	Full Responsibility Sales	750	0	500	0	500	0	500	0	500	0
22	Participation Sales	1010	810	1010	810	789	789	789	789	639	639
23	Adjustment for Remotely Located (totally owned or shared) Generating Unit(s)	0	0	0	0	0	0	0	0	0	0
24	Planned Capacity Resources (16+17+23-20)	6912	8327	7325	8277	7396	8298	7461	8298	7682	8448
25	Adjusted Net Capability (14+19+23-22)	7903	7777	7903	7777	8124	7798	8124	7798	8274	7948
26	Annual System Demand	6733	6736	6831	6829	6916	6932	6978	7005	7048	7059
27	Monthly Adjusted Net Demand (6-7-18+21)	6001	5911	5847	6044	5939	6157	6017	6227	6077	6312
28	Annual Adjusted Net Demand (26-18+21)	7483	6186	7331	6329	7416	6432	7478	6505	7548	6559
29	Net Reserve Capacity Obligation (28 x 15%)	897	763	884	784	897	799	906	809	915	816
30	Total Firm Capacity Obligation (27+29)	6899	6674	6732	6829	6836	6956	6923	7036	6992	7128
31	Surplus or Deficit(-) Capacity (25-30)	1004	1103	1172	948	1288	841	1201	762	1282	820

SUMMER: MAY 1 - OCT 31; WINTER: NOV 1 - APR 30

FORECASTED SEASONAL LOAD & CAPABILITY
MEGAWATTS

MAPP-Canada

		SUM 2008	WIN 2008	SUM 2009	WIN 2009	SUM 2010	WIN 2010	SUM 2011	WIN 2011	SUM 2012
1	Internal Demand in MW (3-2)	5947	7158	6029	7229	6109	7290	6185	7341	6229
2	Standby Demand	0	0	0	0	0	0	0	0	0
3	Total Internal Demand	5947	7158	6029	7229	6109	7290	6185	7341	6229
4	Direct Control Load Management	0	0	0	0	0	0	0	0	0
5	Interruptable Demand	268	268	268	268	268	268	268	268	268
6	Net Internal Demand (3-4-5)	5679	6890	5761	6961	5841	7022	5917	7073	5961
7	Schedule L Purchases	0	0	0	0	0	0	0	0	0
8	Committed Resources (9+10+11+12)	8913	8587	8913	8587	8913	8587	8913	8587	8913
9	Distributed Generator Capacity (1 MW or greater)	0	0	0	0	0	0	0	0	0
10	Other Capacity (1 MW or greater)	8913	8587	8913	8587	8913	8587	8913	8587	8913
11	Distributed Generator Capacity (less than 1 MW)	0	0	0	0	0	0	0	0	0
12	Other Capacity (less than 1 MW)	0	0	0	0	0	0	0	0	0
13	Uncommitted Resources	0	0	0	0	0	0	0	0	0
14	Total Capacity (8+13)	8913	8587	8913	8587	8913	8587	8913	8587	8913
15	Inoperable Capacity	231	0	156	0	156	0	231	0	156
16	Net Operable Capacity (14-15)	8682	8587	8757	8587	8757	8587	8682	8587	8757
17	Total Capacity Purchases	0	500	0	500	0	500	0	500	0
18	Full Responsibility Purchases (Firm)	0	500	0	500	0	500	0	500	0
19	Participation Purchases	0	0	0	0	0	0	0	0	0
20	Total Capacity Sales	1139	639	1109	609	1059	559	1059	559	1029
21	Full Responsibility Sales	500	0	500	0	500	0	500	0	500
22	Participation Sales	639	639	609	609	559	559	559	559	529
23	Adjustment for Remotely Located (totally owned or shared) Generating Unit(s)	0	0	0	0	0	0	0	0	0
24	Planned Capacity Resources (16+17+23-20)	7543	8448	7648	8478	7698	8528	7623	8528	7728
25	Adjusted Net Capability (14+19+23-22)	8274	7948	8304	7978	8354	8028	8354	8028	8384
26	Annual System Demand	7133	7158	7211	7234	7282	7309	7343	7379	7394
27	Monthly Adjusted Net Demand (6-7-18+21)	6179	6390	6261	6461	6341	6522	6417	6573	6461
28	Annual Adjusted Net Demand (26-18+21)	7633	6658	7711	6734	7782	6809	7843	6879	7894
29	Net Reserve Capacity Obligation (28 x 15%)	927	830	938	840	947	850	955	858	961
30	Total Firm Capacity Obligation (27+29)	7107	7220	7199	7301	7288	7372	7372	7431	7422
31	Surplus or Deficit(-) Capacity (25-30)	1167	728	1105	677	1066	656	982	596	962

SUMMER: MAY 1 - OCT 31; WINTER: NOV 1 - APR 30

FORECASTED SEASONAL LOAD & CAPABILITY
MEGAWATTS

MAPP-Total

		SUM 2003	WIN 2003	SUM 2004	WIN 2004	SUM 2005	WIN 2005	SUM 2006	WIN 2006	SUM 2007	WIN 2007
1	Internal Demand in MW (3-2)	35491	30908	36187	31379	36879	31890	37565	32375	38274	32870
2	Standby Demand	0	0	0	0	0	0	0	0	0	0
3	Total Internal Demand	35491	30908	36187	31379	36879	31890	37565	32375	38274	32870
4	Direct Control Load Management	74	346	75	357	76	348	78	338	79	329
5	Interruptable Demand	1527	488	1541	488	1579	488	1606	488	1636	488
6	Net Internal Demand (3-4-5)	33891	30074	34571	30534	35224	31054	35881	31549	36558	32053
7	Schedule L Purchases	220	475	220	485	220	475	220	465	220	455
8	Committed Resources (9+10+11+12)	41107	41233	41180	41222	41188	41228	41182	41229	41232	41279
9	Distributed Generator Capacity (1 MW or greater)	3566	3309	3576	3311	3584	3311	3584	3312	3584	3312
10	Other Capacity (1 MW or greater)	37347	37851	37410	37839	37390	37848	37388	37848	37438	37898
11	Distributed Generator Capacity (less than 1 MW)	10	9	10	9	10	8	10	8	10	8
12	Other Capacity (less than 1 MW)	184	64	184	64	204	61	201	61	201	61
13	Uncommitted Resources	500	608	640	971	1067	1182	1079	1224	2208	2375
14	Total Capacity (8+13)	41608	41841	41820	42194	42255	42411	42261	42454	43440	43655
15	Inoperable Capacity	241	7	78	0	228	0	163	0	92	0
16	Net Operable Capacity (14-15)	41367	41834	41742	42194	42027	42411	42098	42454	43348	43655
17	Total Capacity Purchases	6132	4485	5043	3810	3969	3627	3777	3534	3745	3490
18	Full Responsibility Purchases (Firm)	1731	2916	1654	2723	1618	2686	1623	2692	1569	2645
19	Participation Purchases	4401	1568	3389	1086	2351	941	2154	842	2176	845
20	Total Capacity Sales	5706	4331	5001	3565	3804	3460	3670	3320	3362	3143
21	Full Responsibility Sales	2263	1345	1918	1330	1819	1312	1829	1261	1774	1195
22	Participation Sales	3443	2986	3083	2235	1985	2148	1841	2059	1588	1949
23	Adjustment for Remotely Located (totally owned or shared) Generating Unit(s)	6	6	6	6	6	6	6	6	6	6
24	Planned Capacity Resources (16+17+23-20)	41799	41994	41790	42445	42198	42583	42210	42675	43737	44007
25	Adjusted Net Capability (14+19+23-22)	42571	40429	42133	41051	42627	41209	42580	41244	44034	42558
26	Annual System Demand	36666	36429	37345	37067	38013	37723	38646	38405	39384	39105
27	Monthly Adjusted Net Demand (6-7-18+21)	34423	28503	34835	29140	35426	29681	36087	30118	36763	30603
28	Annual Adjusted Net Demand (26-18+21)	37198	34859	37609	35673	38214	36349	38852	36974	39589	37655
29	Net Reserve Capacity Obligation (28 x 15%)	5255	4971	5327	5093	5418	5194	5513	5286	5622	5388
30	Total Firm Capacity Obligation (27+29)	39678	33491	40162	34251	40843	34896	41599	35426	42385	36014
31	Surplus or Deficit(-) Capacity (25-30)	2894	6939	1971	6800	1784	6313	980	5817	1649	6543

SUMMER: MAY 1 - OCT 31; WINTER: NOV 1 - APR 30

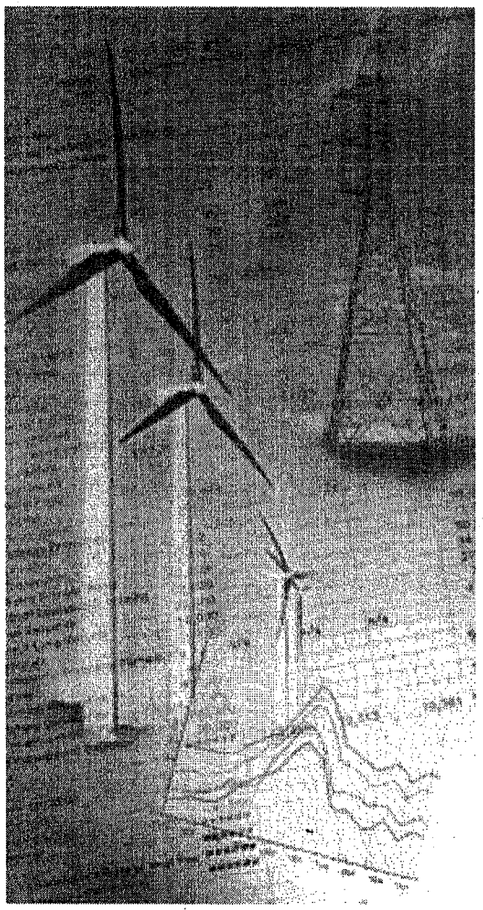
FORECASTED SEASONAL LOAD & CAPABILITY
MEGAWATTS

MAPP-Total

		SUM 2008	WIN 2008	SUM 2009	WIN 2009	SUM 2010	WIN 2010	SUM 2011	WIN 2011	SUM 2012
1	Internal Demand in MW (3-2)	38985	33337	39685	33801	40354	34247	41013	34675	41627
2	Standby Demand	0	0	0	0	0	0	0	0	0
3	Total Internal Demand	38985	33337	39685	33801	40354	34247	41013	34675	41627
4	Direct Control Load Management	80	320	81	331	82	342	84	353	85
5	Interruptable Demand	1656	488	1675	488	1694	488	1713	488	1730
6	Net Internal Demand (3-4-5)	37249	32529	37929	32982	38578	33417	39215	33834	39812
7	Schedule L Purchases	220	445	220	455	220	465	220	475	220
8	Committed Resources (9+10+11+12)	41233	41279	41833	41879	41833	41861	41814	41860	41806
9	Distributed Generator Capacity (1 MW or greater)	3585	3312	3585	3312	3585	3293	3566	3293	3566
10	Other Capacity (1 MW or greater)	37438	37898	38038	38498	38038	38498	38038	38498	38030
11	Distributed Generator Capacity (less than 1 MW)	10	8	10	8	10	8	10	8	10
12	Other Capacity (less than 1 MW)	201	61	201	61	201	61	201	61	200
13	Uncommitted Resources	2208	2375	2508	2675	2508	2675	2508	2675	2508
14	Total Capacity (8+13)	43441	43655	44341	44555	44341	44536	44322	44536	44314
15	Inoperable Capacity	231	0	156	0	156	0	231	0	156
16	Net Operable Capacity (14-15)	43210	43655	44185	44555	44185	44536	44091	44536	44158
17	Total Capacity Purchases	3726	3498	3726	3605	3682	3507	3629	3522	3654
18	Full Responsibility Purchases (Firm)	1526	2652	1528	2660	1530	2667	1518	2681	1520
19	Participation Purchases	2200	845	2198	945	2152	840	2111	840	2134
20	Total Capacity Sales	3132	3044	3482	3318	3392	3151	3122	2947	3092
21	Full Responsibility Sales	1654	1155	1654	1159	1654	1165	1579	1091	1579
22	Participation Sales	1478	1889	1828	2159	1738	1986	1543	1856	1513
23	Adjustment for Remotely Located (totally owned or shared) Generating Unit(s)	6	6	6	6	6	6	6	6	6
24	Planned Capacity Resources (16+17+23-20)	43810	44115	44435	44848	44481	44898	44605	45117	44727
25	Adjusted Net Capability (14+19+23-22)	44169	42618	44717	43348	44761	43397	44896	43527	44941
26	Annual System Demand	40085	39816	40789	40480	41442	41126	42084	41758	42702
27	Monthly Adjusted Net Demand (6-7-18+21)	37377	31031	38055	31481	38701	31916	39276	32244	39870
28	Annual Adjusted Net Demand (26-18+21)	40212	38319	40915	38979	41565	39624	42144	40168	42761
29	Net Reserve Capacity Obligation (28 x 15%)	5715	5486	5819	5584	5915	5679	6001	5759	6091
30	Total Firm Capacity Obligation (27+29)	43092	36541	43874	37089	44616	37621	45276	38024	45961
31	Surplus or Deficit(-) Capacity (25-30)	1077	6076	843	6258	144	5776	-380	5502	-1020

SUMMER: MAY 1 - OCT 31; WINTER: NOV 1 - APR 30

Minnesota Energy Planning Report 2001



Minnesota Department of Commerce

The second and perhaps most critical challenge in electricity is the future viability of the transmission system. We need to closely focus on meeting this challenge in order to ensure continued viability and vitality of energy services for the future.

The third major challenge is reducing pollution from electric generation. Meeting this challenge will require exploring potential emission reduction strategies, pricing them, and choosing those that will provide the largest reductions for the least cost. In addition, we need to take advantage of future emissions reduction technologies or strategies, particularly for mercury and greenhouse gas emissions, as they become available. At the same time we should ensure that any new electric capacity does not increase overall pollution from the power production sector.

The fourth challenge is in affordability of energy services, including electricity, natural gas, propane, fuel oil, and similar energy sources, for Minnesota energy consumers.

All of these challenges are intertwined. This report explores three of the major challenges noted above:

- electric capacity;
- electric transmission; and
- air pollution emissions from existing and future power plants.

A separate report, which will be available in January, 2002, addresses challenges in maintaining affordability of energy services for all Minnesotans.

Electric Capacity

During the next nine years we need to add more than 2000 MW of electric capacity to serve Minnesota consumers. About 1000 MW of that amount is in planning or approval processes now. There has been a major shift in capacity planning. *It appears that capacity will be added in smaller increments as it is needed, rather than by last century's model of huge central power plants with excess capacity into which we grew over time.* This new model will be created as we go.

To get additional capacity into the system, we recommend a conservative approach at this time. First, maximize energy conservation and energy efficiency, as well as load management programs, because they cost the least and impose the fewest infrastructure, logistic, and environmental burdens. Then, develop to the greatest extent Minnesota's own energy resources, such as wind energy with backup to create firm capacity (which is commercially viable now), solar energy, and bioenergy.

Any additional capacity needed once we have maximized conservation, efficiency, and renewable resources should be built using the most environmentally sound, least cost, and most efficient technologies available now and into the future. The energy facilities we build today will be those that provide electricity for many decades. We should not saddle future generations with the kind of difficult challenges we face in the energy system today, particularly the difficulties in transmission siting and routing, pollution abatement, and service affordability.

Energy generation is the subject of more technology research and development today than it has been since at least the 1970s and perhaps as far back as the 1920s and 1930s. We should not limit our future ability to take advantage of new and improved technologies. *We should not rely too heavily on the technologies of the last century, thereby foreclosing our ability to deploy better technologies as they become available.* To the extent that we do build additional facilities using old technology, we should ensure that those facilities use the best, least polluting, least cost, and most efficient processes for generating electricity of which they are capable.

Electric Transmission

The transmission system in Minnesota, the upper midwest, and the nation is aging, operating at or near capacity much of the time, and is being increasingly required to move electricity in ways it was not designed and built to accommodate.

2001 ENERGY PLANNING REPORT

TWO: CHALLENGES IN ELECTRICITY

Statewide, unless new capacity is found or built, utilities will experience an electric capacity deficit during the next decade, based on projections available today. Planning procedures are in place, however, that should produce enough electric capacity, through additional generation, transmission and conservation measures, to meet growing demand. The new capacity may look quite different than traditional capacity and it also may be developed in smaller increments as it is needed.

Transmission presents one of the greatest challenges to the electric system. The need for upgrading and extending transmission is immediate. Accomplishing those improvements appears more distant.

Chapter 1 provided an overview of the history and trends in the use and cost of energy in the state and explained the current structure of each major energy industry. This chapter discusses present and future challenges in the electric energy system, focusing on three major areas:

(1) potential electric supply deficiencies;
(2) electric transmission capacity and regulation;
(3) air pollutant emissions from existing and future electric generation plants.

Statewide, unless new capacity is found or built, utilities will experience an electric capacity deficit during the next decade, based on projections available today. Planning procedures are in place, however, that should produce enough electric capacity, through additional generation, transmission and conservation measures, to meet growing demand. The new capacity may look quite different than traditional capacity and it also may be developed in smaller increments as it is needed.

Forecasting electric demand is inherently subject to uncertainty because it tries to predict the future. Nevertheless, efforts to forecast future demand are critical to successful energy planning, because significant programs and infrastructure to ensure adequate electric supply require years of lead time to be put into place.

Of the three categories of major electricity challenges listed above, probably the most acute is sufficient transmission to ensure the continuing reliability of the electric energy system. Of all public benefit infrastructure, transmission lines are the most controversial and, therefore, the most difficult to site. In addition, how we meet the electric capacity challenges in the future has major implications for transmission. Conversely, how and where we build transmission has major implications for the type and size of new generation facilities and how they are dispatched to serve retail consumers and wholesale purchasers.

Emission of air pollutants from existing power plants also needs attention. Due to grandfathered exemptions under the Clean Air Act of 1970, 55 percent of Minnesota's coal-fired electric generating plants (over 3000 MW), are exempt from the most stringent air emission limits. These plants are not being retired as envisioned thirty years ago, and presently emit at rates 10 to 20 times the rate of new, modern plants. Especially at a time when significant new generating capacity may be added to the system, cost-effective emission reductions should be made at the older plants. This chapter and the environmental study in Appendix A recommend that total emissions from utilities in the future be significantly lower than today, including emissions from whatever new generation capacity is needed.

While this report focuses on these three major electric challenges, others are worth noting here for future discussion. Like electric transmission, all infrastructure for the transportation and delivery of all forms of energy is aging and is operating at or near capacity a majority of the time. Pipelines to transport petroleum, petroleum products, and natural gas were, for the most part, also built decades ago. Again, the needed capital investment in transportation of these fuels will be reflected in the prices consumers will pay in the future.

Finally, a challenge as great as, or perhaps greater than, the electric transmission challenge, is affordability of all energy services. We at the Department of Commerce, the PUC, and the Residential Utilities Division of the Attorney General's Office, work continually with utilities to ensure lowest cost energy services to Minnesotans. Even so, this lowest cost will increasingly strain the budgets of Minnesota's seniors, working families, and low income households, which make up over 400,000 households in the state. 2001 legislation requires a separate report on universal service issues. That report will be available in mid to late January 2002.

Potential Electric Supply Deficiencies

This section presents and discusses several perspectives on forecasts of Minnesota's need for additional electric capacity by 2010. It presents forecasts done on a regional level by the Mid-Continent Area Power Pool (MAPP), statewide trend line analysis, and the individual system forecasts done by the various utilities as part of their integrated resource planning (IRP) cycle.

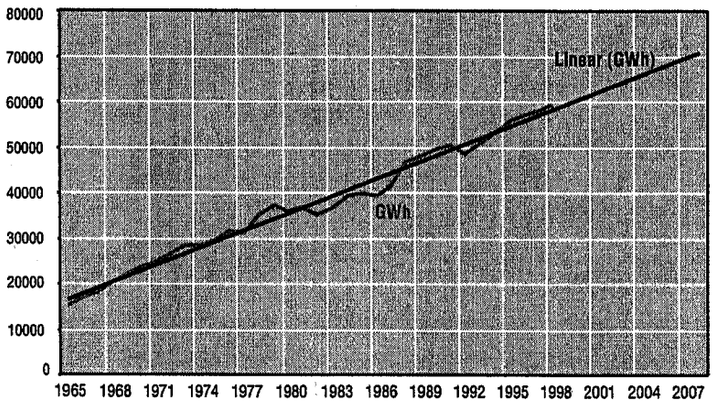
Adding electric infrastructure cannot be done in the short term. Almost all generating and transmission facilities take years to:

- Obtain all of the required various state and federal regulatory clearances and permits.
- Place orders for the major components of the facility.
- Site the facility.
- Build the facility and its appurtenant structures.

Major baseload generating facilities can and have taken up to a decade to move from the drawing board to providing electricity to customers. Because of the need for significant construction lead time, it is critically important—and a challenge—to maintain an active forecast of future generation and transmission needs. Forecasting future electrical demand and supply is the best method for electric service providers to determine what new facilities or programs are needed and when to begin the planning and construction process for specific projects.

A forecast uses data from the past in an attempt to predict the future. The crudest type of forecast is a simple trend line. A trend line simply takes past energy usage and plots a line to fit the data. Figure 2-1 shows the application of a trend line for historic electric energy usage in Minnesota to predict future energy use. The trend line predicts that electric energy usage will increase by 1,267 gigawatt hours (GWh) each year. Figure 2-1 extends the trend line 12 years into the future from the data for the period 1965-1998. By the end of the 10-year forecast in 2010, electric energy usage is predicted to grow to about 72,100 GWh. If electric energy usage occurred perfectly evenly throughout the year, a minimum of 145 MW of new capacity each year would be needed in Minnesota to supply the 1,267 GWh.[20] Because electric energy usage is not constant every day throughout the year, more capacity is needed to meet peaks in demand than would be needed to meet overall growth in energy use.

Figure 2.1: Minnesota Electric Energy Useage Trend Line, 1965–2009



A simple trend line is a poor forecasting tool because it does not allow the forecaster to identify the factors that influence energy use or determine how to influence future energy use. Furthermore, it does not allow the forecaster to change those factors to produce a reliable forecast band. For example, the trend line may implicitly assume that the significant increases in labor force participation which occurred from the 1960s through the 1990s (and are therefore part of the trend-line) will continue even though such increases may not be possible in the future. A more complex forecast could analyze this and other questions. A trend line cannot explain what happened; it can only show on average what happened, and then assume that the exact same thing will continue to happen.

Typical variables that are used to produce more reliable forecasts include economic factors such as employment, investment, and output; weather factors such as heating degree days and cooling degree days; and other factors such as air conditioning saturation, number of customers, and population. Factors affecting short-term consumption are frequently different than the factors affecting long-term trends. Because different factors are more important in the short run versus in the long run, forecasters often use different equations for short-term and long-term forecasts and then blend the two together to create an overall forecast. For example, if a recession is imminent, a short-term forecast may focus on short-run economic variables while a long-term forecast may ignore a looming recession and focus on structural changes, both in the economy and in customer energy-usage patterns, that will have longer-term influence than a one or two year recessionary cycle.

Forecasting is most often performed on a utility system level. Each utility forecasts the demand in its service territory. Regional forecasts can either be performed separately, based on utility-specific forecasts, or calculated by simply accumulating the various utility-specific forecasts.

Electrically, the United States is divided into 10 dif-

ferent regions by the North American Electric Reliability Council (NERC). Each region is a voluntary association of electric utilities. Minnesota is in the Mid-continent Area Power Pool (MAPP) region. MAPP contains all or most of Saskatchewan, Manitoba, North Dakota, South Dakota, Nebraska and Minnesota. It also contains portions of Montana, Iowa and Wisconsin. MAPP was formed in the mid-1960s and presently performs three functions:

- reliability council, responsible for the safety and reliability of the bulk electric system, under NERC;
- regional transmission group, responsible for facilitating open access of the transmission system; and
- power and energy market, where members and non-members may buy and sell electricity.

Utility transmission planning responsibilities for Minnesota and surrounding states have been coordinated and managed through an extensive planning process at MAPP since 1996. MAPP has the authority to order one of its member utilities to build facilities if deemed necessary for reliable grid operations. A key component of the MAPP transmission planning system is a "bottom up" process of sub regional planning groups that includes the member utilities serving five different sub sections of the MAPP region.

Individual utilities that own transmission facilities have had the primary responsibility to plan for the future expansion and maintenance of the transmission grid. Each utility considers a range of forecasts of future load growth expectations and its own selection of choices for electric supply when conducting its transmission planning. The main driving force behind this planning has been the adequacy of electricity supply for local load serving obligations. Increasingly, due in part to federal regulations, transmission planning must take into account considerations for bulk power transactions and open access to the system for nontraditional transmission transactions.

MAPP performs some utility planning to ensure the safety and reliability of the bulk electric system. Each year, all utilities in the MAPP region file a *Load and Capability Report* with MAPP, which then assembles the various filings into a single document. MAPP's most recent *Load and Capability Report* was dated May 15, 2001.

To ensure a degree of commonality, the Department of Commerce often uses the MAPP *Load and Capability Report* to show the current forecast of use of electric energy and capacity in the region. The only major generation and transmission owning utility that serves Minnesota and is not in MAPP is Alliant Energy (formerly Interstate Power Company) which serves only a small number of customers in the state.

Regional Forecast

While there are several sources of forecasts for the region, the Department of Commerce typically relies mostly on forecasts from MAPP. One source of MAPP forecasts is the annual *Reliability Assessment* published by the NERC. The *Reliability Assessment 1999-2008* provides forecasts from each of the 10 NERC regions and an overall grid assessment. In the May 2000 *Reliability Assessment 1999-2008,* MAPP stated that "when load forecast uncertainty is taken into account, the Region may have a capacity deficit by summer 2000 and nearly 5,400 MW deficit by summer 2008." This 1999 forecast informed NERC of significant potential reliability concerns on the utility planning horizon in the MAPP region, and served to focus policymakers and utilities on the need to begin concerted efforts to assure that Minnesota's generation and transmission needs will be met in this decade.

The most recent MAPP-specific forecast was issued in the spring of 2001.[21] MAPP's 2001 forecast shows electric generating capacity as being short 3,500 MW of meeting peak electric demand plus the 15 percent reliability reserve margin by 2010.[22] The lower figures, as compared to the estimates in 2000, reflect two new gas peaking plants that just came on line in 2001, plus other small generating unit additions. They do not reflect other proposed projects, some of which have been approved for construction.

Figure 2-2 illustrates MAPP's forecast of energy use from the *Load and Capability Report* data between 2001 and 2010. MAPP forecasts that energy usage in the region will rise from about 149,000 GWh in 2001 to 176,000 GWh in 2010.[23] This level is equal to an annual growth rate of about 1.9 percent (or 3,019 GWh per year).

Figure 2.2: MAPP U.S. Region Energy Forecast, 2001–2010

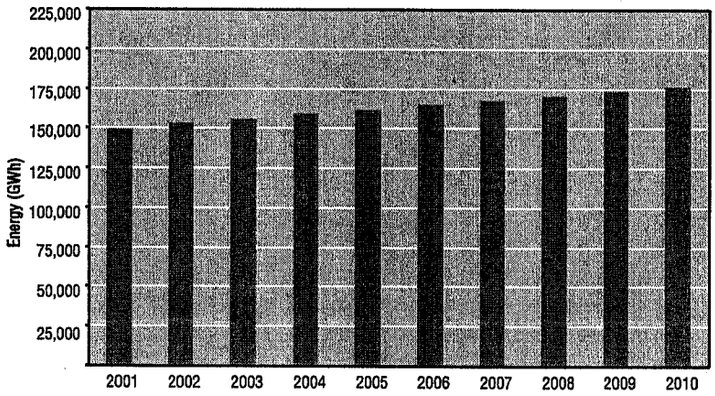


Figure 2.3: MAPP U.S. Regional Electric Capacity Situation, 2001–2010

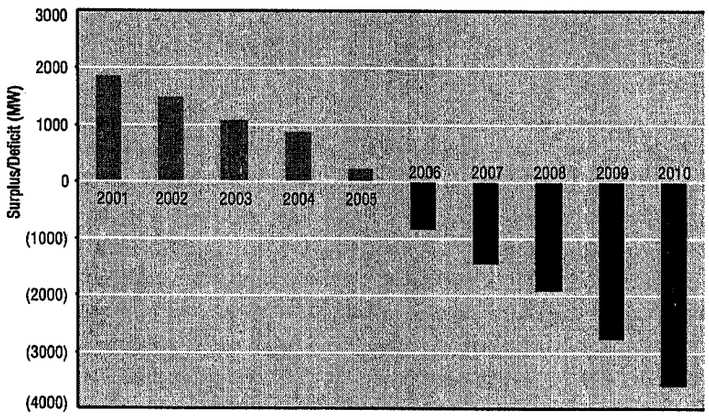


Figure 2-3 provides the results of MAPP's analysis. Figure 2-3 shows that the MAPP region forecasts a net surplus of capacity through 2005. A small net capacity deficit[24] is forecasted for 2006, with the net capacity deficit growing substantially to nearly 3,600 MW by 2010. This result means that entities in the MAPP region must either build new power plants, reduce electric demand growth[25] or find new imports from other regions by 2006. The alternative is to risk not having enough capacity to keep the system reliable and meet customers' energy needs.

On October 16, 2001, NERC released its *Reliability Assessment 2001-2010,* this report states (on page 43),

> *when demand forecast uncertainty is taken into account, the Region [MAPP-U.S.] may be capacity deficient by 2004 summer and nearly 5,442 MW deficient by 2010 summer. MAPP-U.S. utilities have committed to provide an additional 5,018 MW of capacity during this period.*

All of these regional forecasts conclude that, although MAPP is forecasted to have an electric supply deficit by the end of this decade, somewhere between 3,500 and 5,000 MW, the presently sagging economy (which lowers overall demand) and future capacity proposals should go far to balance the electric supply with demand into the future. The key is to remain diligent in encouraging additional sources of generation as well as active conservation of present supplies.

Methods of quantifying the comparison of generation, transmission, and demand side resource alternatives should be further developed. A particularly difficult challenge is the analysis of comparing market price change risks and reliability risks between alternatives. Reliability risks fall into two general categories - system security risks and adequacy of supply risks. The pending deficit in generating capacity in MAPP projections is an example of an adequacy of supply risk. The "regional blackout scenario" that might occur at any time from an extreme storm related disturbance is an example of a system security risk. Effective planning must identify the magnitude and probability of reliability challenges to both adequacy of supply and system security. Priorities for future infrastructure additions must be developed considering a risk management approach that is consistent with the public interest.

Minnesota Forecast

This section attempts to provide insight into what Minnesota's statewide demand will be in 2010. This process must be treated as an approximation, for four reasons. First, statewide data are not available through the MAPP or utility forecasts. Second, the MAPP forecasts are based on data provided by the utilities which often use inconsistent methods of data collection and calculations. Third, many utilities, such as Otter Tail Power Company and Xcel Energy, have operations in several states and must ensure that they are able to meet requirements in each state. Finally, to assure system backup, reliability, and economic and operational efficiencies, the electrical system was designed so that no state could be easily isolated from other states. Therefore, we can produce only a crude forecast for energy use in Minnesota by fitting a simple trend line to data on statewide energy use.[26] The resulting trend line produces an estimate of about 60,719 GWh in 2001 and

surpluses (three of 50 MW or less), and only Otter Tail Power and Missouri River show small deficits (50 MW or less).

As discussed above, in addition to data provided to MAPP each April 1, most of the larger utilities file integrated resource plans (IRPs) with the Minnesota Public Utilities Commission. An IRP provides a comprehensive overview of a particular utility's forecasts, existing supply-side resources, existing demand-side resources, and action plans to meet potential deficits for a 15-year period.

Figure 2.10: Short-Term IRP Forecasts, 2001-2006

Utility	Year IRP filed	2001	2002	2003	2004	2005	2006
Alliant	1999	5	(10)	(28)	(51)	(99)	(123)
Dairyland	2000	(20)	(41)	(87)	(106)	(129)	(152)
Great River Energy	2001	(227)	(224)	(251)	(293)	(394)	(370)
Minnesota Power	1999	249	59	49	38	26	-
Minnkota	1998	65	59	49	45	41	36
Missouri River	2001	-	-	-	-	(12)	(31)
Otter Tail Power	1999	(81)	(92)	(96)	(100)	(74)	(79)
SMMPA	2000	(39)	(52)	(61)	(68)	(76)	(85)
Xcel Energy	2000	(212)	(376)	(422)	(379)	(526)	(1181)

Figure 2.11: Long-Term IRP Forecasts, 2007-2015

Utility	2007	2008	2009	2010	2011	2012	2013	2014	2015
Alliant	(145)	(168)	(391)	(414)	(437)	(460)	(484)		
Dairyland									
Great River Energy	(261)	(360)	(463)	(520)	(536)	(640)	(745)	(858)	(962)
Minnesota Power	-	15	-	-	-	-	-		
Minnkota	32	27	22	17	13	8			
Missouri River	(46)	(60)	(76)	(90)	(110)	(124)	(139)	(155)	(169)
Otter Tail Power	(86)	(94)	(97)	(97)	(97)	(100)	(106)	(109)	
SMMPA	(93)	(101)	(110)	(118)	(126)	(134)	(143)	(151)	(158)
Xcel Energy	(1,468)	(1,633)	(1,853)	(2,028)	(2,198)	(2,360)	(2,515)	(2,675)	

Currently nine utilities, which ultimately serve the vast majority of Minnesota energy consumers, file IRPs with the Minnesota Public Utilities Commission (PUC).[30] A PUC Order approving or modifying a utility's IRP is binding with respect to rate-regulated investor-owned utilities and advisory only for cooperative and municipal generation and transmission utilities. The utilities file their IRPs at various times, typically every other year. However, some of the cooperative and municipal utilities may have several years between IRP filings. Figure 2-10 shows the estimated surplus or deficit for each of the utilities who have filed an IRP covering the 2001 through 2006 planning period.[31]

Figure 2-11 shows the estimated surplus or deficit, before implementation of any identified action plan, for each of the utilities filing an IRP in the long run (2007 through 2015). Since the filings are made at different times and in different manners, not all of the utilities report a surplus or deficit number through 2014.

Figures 2-10 and 2-11 show that virtually all of the utilities have a deficit at some point during the next 15 years. Therefore, all of the utilities have action plans which involve acquiring more resources. These plans may include more demand-side management (load management, increased efficiency in use, energy conservation), construction of power plants, short-term purchases from the market, long-term purchases from the market, and combinations of the above. Figure 2-12 summarizes the IRP capacity additions planned by the utilities, by year and size, through new power plant construction and by long-term power purchase agreements (PPAs) with other power generators.[32] In most cases, it is not clear what type of generation technology will be proposed or built.

Figure 2.12: IRP Supply Side Action Plan Summary (50MW or More)

Utility	Size (MW)	Type	Date
Otter Tail Power	50	PPA	2000
Dairyland	80	Peaking	2001
Xcel Energy	80	Wind	2002
Great River Energy	250	Peaking	2003
SMMPA	93	Peaking	2003
Xcel Energy	100-600	PPA	2003
Alliant Energy	154	Peaking	2005
Xcel Energy	up to 400	PPA	2006
Xcel Energy	up to 500	PPA	2007
Alliant Energy	538	Peaking	2008
Xcel Energy	up to 600	PPA	2008
Alliant Energy	430	Base	2009
Great River Energy	250	Base	2009
Alliant Energy	215	Base	2010
Alliant Energy	154	Peaking	2010
Otter Tail Power	78	Peaking	2010
Alliant Energy	430	Base	2011
Alliant Energy	215	Base	2012
Alliant Energy	76	Peaking	2012
Alliant Energy	215	Base	2014

NOTE: Alliant Energy is not a member of MAPP, and the vast majority of its customers are not in Minnesota.

This in-depth forecasting analysis shows the importance and the appropriateness of continuing with an IRP or similar process to evaluate future resource needs of each utility system. The different utility systems are experiencing very different growth rates, 0.8 percent to 4.0 percent per year, for different reasons. Similarly, five of the 11 large utility systems forecast major capacity deficits for 2010, two have small deficits, three have small surpluses, and one has a substantial surplus. Any response to the statewide capacity deficit must consider the different circumstances of each individual utility.

In the process of creating this report, we have been able, for the first time, to analyze individual utility IRPs

72,122 GWh in 2010.[27] This amount equals an annual growth rate of about 1.9 percent per year for energy usage, the same growth rate MAPP assumed in its regional forecast. The trend line is illustrated in Figure 2-1.

In addition to the statewide forecast given above, the forecasts of the larger utilities doing business in Minnesota can be combined to try to get an additional picture of expected statewide demand growth.[28] Figure 2-4 shows the results of combining data from MAPP data. Figure 2-4 shows the larger utilities forecasting energy use of 86,607 GWh in 2001, growing to 102,533 GWh in 2010. These numbers are larger than the statewide numbers quoted above. This fact indicates that the large utilities have significantly more energy use outside of Minnesota than is used by the smaller Minnesota utilities excluded from the data. The large utility[29] energy forecast results in an annual growth rate of about 1.9 percent per year, roughly confirming the 1.9 percent growth rate forecasted by the trend line discussed above and the MAPP regional forecast.

The purpose of combining the large Minnesota utilities' energy forecasts is that they create an estimate of the capacity surplus or deficit faced by the utilities serving the State. Figure 2-5 shows that the large utilities have a Minnesota capacity surplus in 2001 (1,041 MW). That surplus first becomes a deficit in 2006 (653 MW). The deficit grows for the rest of the period, reaching 2,050 MW in 2010. The rise in surplus capacity for 2004 shown in Figure 2-5 reflects the beginning of a 300 MW purchase from Manitoba Hydro by Xcel Energy and the end of a 200 MW firm sales from Xcel Energy to Wisconsin Public Service, for a net increase in capacity of about 500 MW.

Minnesota also must be certain that maintenance of the transmission system meets industry standards, so that risk of outage from physical damage is kept to a minimum. Managing risk from failures of computerized operating systems and from potential sabotage requires a new focus, and becomes increasingly critical as transmission interconnections expand on a national scale. New technologies that better manage the flow of electrons on the existing system should be applied whenever feasible, both to enhance the operation of the existing system and to reduce the need for new lines.

Figure 2.4. Major Minnesota Utility Electric Energy Situation, 2001–2010

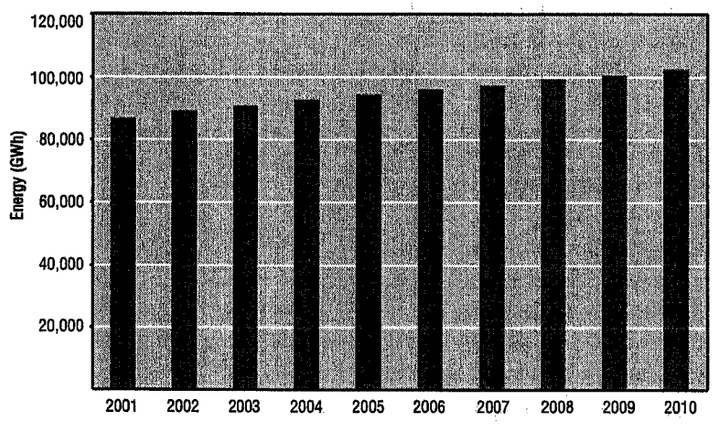


Figure 2.5. Major Minnesota Utility Electric Capacity Deficit, 2001–2010

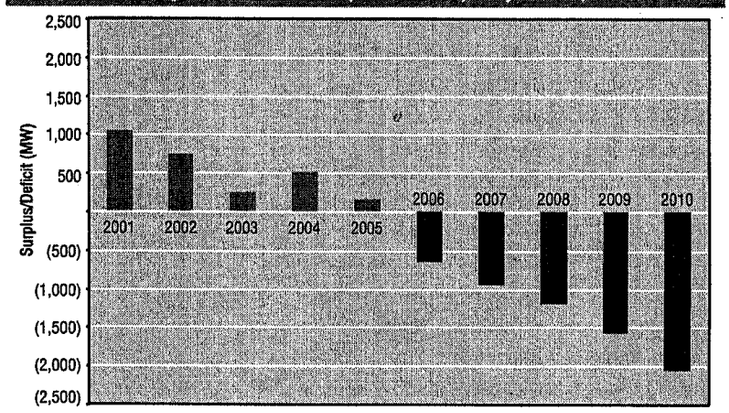


Figure 2.7: Xcel Electric Capacity Forecast, 2001–2010

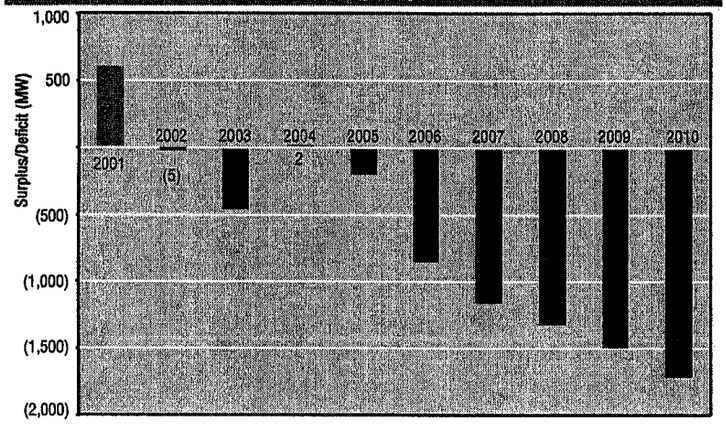


Figure 2.8: Large Utilities with Electric Capacity Deficits Over 100 MW, 2001–2010

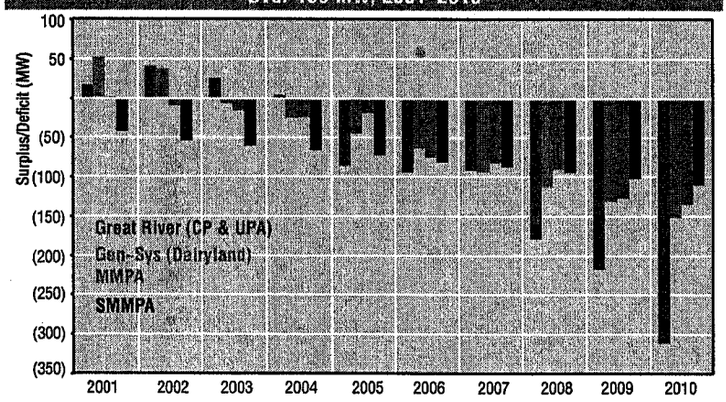
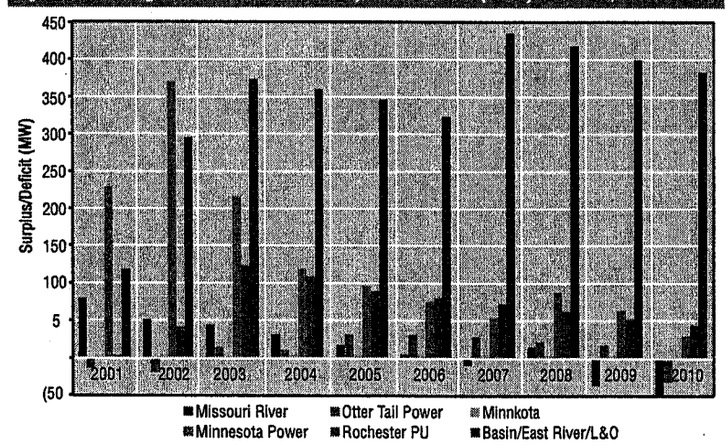


Figure 2.9: Large Utilities Without Major Electric Capacity Deficits, 2001–2010



Utility Specific Forecasts

There are eleven different utilities or organizations that file data with MAPP that meet the definition of 'large' as discussed above. The forecasted annual growth rate in energy use for each is provided in Figure 2-6. Annual growth rates vary from 4.0 percent per year for Missouri River to 0.8 percent per year for Minnesota Power.

Figure 2.6: Large Utility Growth Rates

Utility	Energy Growth Rate (2001-2010)
Missouri River	4.0%
Rochester	3.6%
Great River (CP & UPA)	2.7%
Minnkota	2.5%
SMMPA	2.3%
MMPA	2.2%
Xcel Energy	2.0%
Gen-Sys (Dairyland)	1.8%
Basin/East River/L&O	1.3%
Otter Tail Power	1.0%
Minnesota Power	0.8%

The number of power plants required to produce the energy needs discussed above can be determined by a utility-by-utility capacity analysis. Of the 11 utilities, five show significant deficits (over 100 MW) and the other six have either small deficits or surplus throughout the planning period. By far the largest utility doing business in Minnesota, and the utility with the most significant capacity deficits, is Xcel Energy. In order to produce figures of readable scale, the capacity situation of Xcel is provided in Figure 2-7 and the capacity situations of the other four utilities with significant deficits are provided in Figure 2-8.

Note: Xcel Energy's Prairie Island nuclear-fired generating plant (1,000 MW) will use up its approved spent fuel storage capacity in 2007. Without the legal authority and physical facilities to continue to store spent fuel, Prairie Island must discontinue operation in 2007. In addition, the two reactors at Prairie Island are due for relicensing by the Nuclear Regulatory Commission (NRC) in 2013 and 2014. In order to achieve relicensing by these dates, the relicensing process must begin in 2006 and 2007.

Xcel's forecasts continue to include the capacity presently generated at Prairie Island. The plant will continue to operate or will be replaced with equivalent new or purchased capacity. As required by the Minnesota Public Utilities Commission, Xcel has filed to begin a competitive bidding process, PUC Docket No. E002/M-01-1480, to acquire contingent replacement power as an "insurance policy" in case the Prairie Island plant must be shut down. In addition, under existing PUC orders, the Prairie Island plant will be fully depreciated and its decommissioning fund fully funded by 2007.

Figure 2-9 shows the capacity situations of the six utilities that do not forecast significant deficits. Of the six utilities falling into this category, four show

in relation to each other. It is clear that IRPs are important not only individually as documents dealing with individual utility systems, but collectively as tools to determine statewide forecasts and action plans.

The regional, statewide and utility-specific forecast perspectives presented in this section show an estimated Minnesota capacity shortage of at least 2,000 MW by 2010. In addition to electric capacity needs, Minnesota faces transmission issues that are even more complicated and difficult to address than capacity needs. The next section explores these issues.

Electric Transmission Capacity and Regulation

Electric transmission facilities must be in place with enough capacity to move electricity from where it is generated to where it is consumed. Since a wireless technology for transmitting electricity has not yet been developed, there is no alternative to some form of the transmission wires with which we are all familiar.

Many existing transmission lines were installed up to fifty years ago. Some of Minnesota's transmission facilities are reaching the end of their useful lives. Transmission lines built fifty years ago were designed to meet existing and foreseeable future (typically 15 years) demand. Customer numbers and demand levels both have increased dramatically since the 1950s. The transmission lines in place to meet today's demand are the same lines built to meet demand of decades ago. Demand will continue to increase.

In addition, Federal Energy Regulatory Commission (FERC) Order 888 places a strain on existing lines. This order requires transmission owners to provide other utilities and marketers equal access to their lines. The result has been a dramatic increase in wholesale transactions through transmission grids not designed to accommodate a lot of bulk transfer from state to state and region to region. The need for new and/or upgraded transmission facilities is imminent.

This situation presents quite a challenge. Transmission lines are notoriously hard to site. The process usually involves resolution of both landowner and environmental issues. Usually a transmission line and its right-of-way touch or cross the property of many landowners who, collectively or individually, often actively and strongly oppose a transmission line proposal. Transmission lines also may cross wetlands or bisect forests contributing to ecosystem fragmentation. Both upgrading and building new electric transmission is one of Minnesota's biggest energy challenges—balancing environmental protection, landowners' rights, and the need to meet the ever-growing demand for electricity.

In addition, new transmission is needed to develop large-scale wind energy, which is increasingly cost competitive. Minnesota has a tremendous wind energy resource. The best wind resources, however, are in geographic areas distant from load centers where traditional electric generation plants, and therefore transmission lines, have not generally been built. New transmission capacity is critical to the full development of the upper Midwest's substantial wind resources.

Another related challenge surrounds the emergence of merchant power plant construction. "Merchant" plants are built and operated by non-utilities and are not subject to normal utility regulation. The backers of a merchant plant provide the financing for the project, price their product (electricity) as they please (usually to compete in the open market) and take the financial risk of profit or loss. Merchant plants, because they are not deemed "utilities" by Minnesota law[33] do not have the power of eminent domain to assist them in siting their facilities. Merchant plants face unique siting challenges because they must obtain the agreement of local landowners.

Research and advances in energy conservation and other distributed energy resources such as smaller generators located at or near where the electricity is used offer hope that soon there will be a way to ease the burden on the electric transmission system and reduce the need for new lines. A conclusion presented in the 2000 Energy Policy and Conservation Report continues to define strategic direction for infrastructure needs. It reads: "The demand for energy continues to increase but the power generating facilities and transmission infrastructure used to deliver power are already being used to their maximum potential. In order to preserve stable, reliable and attractively-priced energy resources, the energy companies, government and other affected parties must work together to adjust energy planning, man-

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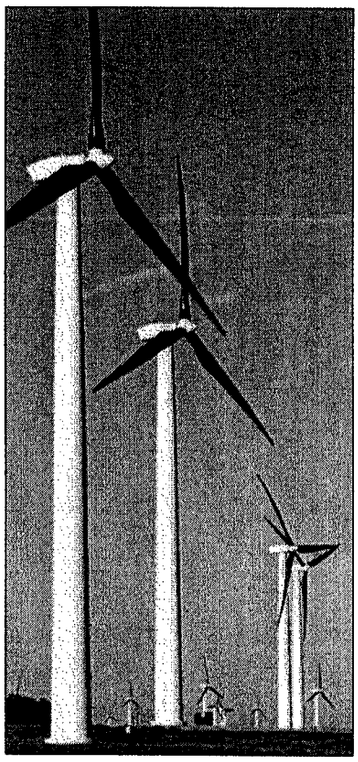
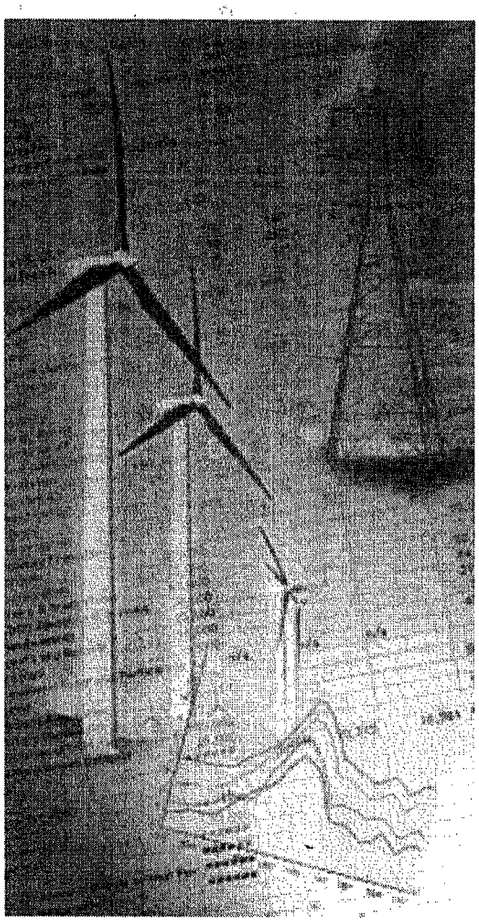


Energy Policy & Conservation Report 2000

Minnesota Energy Planning Report 2001



Minnesota Department of Commerce

What Do We Expect For the Future?

Electricity

The consumption of electricity in Minnesota is expected to continue to increase at an average rate of about 2 percent annually over the next few years, based on the combined projections of all utilities serving Minnesota customers. There is not excess generating capacity available to meet this increasing demand. Thus, in the near future, significant new generation will be necessary to serve the electric needs of the state and the region.

Prices in the wholesale market have already begun to rise during peak demand periods. As electric demand in Minnesota and the region approach the total available capacity, prices are likely to continue to rise. Such higher prices reflect the capital costs of investing in new generation and would result regardless of whether the industry is regulated or operating in a free market environment. The higher prices may, in turn, result in less demand, but would not significantly reduce the 2 percent annual growth in the next ten years.

Based on the electric generation currently planned and being constructed, the fuel mix for electric generation will change somewhat in the coming years. Both of the electric peaking plants under construction use natural gas as the input fuel. There are also plans for significant increases to the levels of wind generation in the state. However, relative to the total amount of electricity consumed in the state, these changes will have only a minor impact on the overall mix (shown for 1998 in Figure 17).

The largest increase in the consumption of natural gas in the next few years will come from the electric generation sector. (This trend is only starting to be evident, as shown in Figure 4, which includes data through 1998.) As the new natural gas fired peaking plants come online, consumption of natural gas in Minnesota will significantly increase. Natural gas consumption in the residential and commercial sectors will remain steady in the case of continued mild winters or will increase significantly in the case of a severe winter. The industrial sector will likely continue to have increased consumption of natural gas until current pipeline capacity is fully utilized.

Despite the existence of adequate natural gas supplies for the foreseeable future, gas production levels have not yet geared up to meet the new levels of demand.

As with electricity, infrastructure capacity is a major factor in the future consumption and price of natural gas. Currently, the largest pipeline, Northern, is fully utilized in the winter season. After the two planned electric peakers are built, Northern has estimated that it will have comfortably the capacity for only one to two additional peaking plants, depending on where they would be located on the system. The Great Lakes pipeline has available capacity for any increased natural gas consumption that would occur in the northern half of Minnesota. And on the Viking pipeline, additional construction would be necessary for any increases in year-round capacity.

Once demand increases beyond the current available pipeline capacity, it would require significant new investment in infrastructure. At first, that new investment would be charged only to the customers using the new pipeline capacity. However, the pipeline could then file a rate case with FERC. If the pipeline demonstrates that the expansion has benefits for the entire system then the new investment costs would be incorporated into the overall rates and the price charged to all customers would reflect the increased costs.

Currently, the early impacts of increased demand are being felt. During the Summer of 2000 natural gas prices experienced a rather significant increase. Several factors influenced this price change. Low gas prices during the past few years have not encouraged increased exploration and drilling of new natural gas reserves. Despite the existence of adequate natural gas supplies for the foreseeable future, gas production levels have not yet geared up to meet the new levels of demand. Natural gas prices often follow oil prices. Natural gas prices have been quite low during the late 1990s, but in the summer of 2000 were at their highest levels in over a decade. Also, since natural gas futures are actively traded on the New York Mercantile Exchange the commodity market sometimes exacerbates price increases through active trading. Finally, the new and large demand for natural gas from new electric peaking plants (both in state and around the nation) powered by natural