

STATE OF MINNESOTA
OFFICE OF ADMINISTRATIVE HEARINGS
FOR THE DEPARTMENT OF COMMERCE

In the Matter of the Application for a High
Voltage Transmission Line Route Permit
for the Badoura 115 kV Transmission
Project

**FINDINGS OF FACT,
CONCLUSIONS AND
RECOMMENDATION**

This matter was assigned to Administrative Law Judge (ALJ) Richard C. Luis, acting as a Hearing Examiner for the Minnesota Department of Commerce (Department). A public hearing was held at 7:00 p.m. on Wednesday, August 29, 2007 at the Backus City Hall in Backus, MN. The hearing continued until all persons desiring to speak had done so. No evidentiary hearings were held. The public hearing record closed on September 21, 2007, when a Brief (filed September 20, 2007) and Proposed Findings (filed September 21, 2007) were filed by David Moeller, Attorney for Minnesota Power, 30 West Superior Street, Duluth, MN 55802 on behalf of Minnesota Power (MP) and Great River Energy (GRE) (collectively the Applicants or the Utilities).

Appearances: Jim Atkinson, Environmental Services for Minnesota Power, 30 West Superior Street, Duluth, MN 55802 appeared on behalf of MP. Carole Schmidt, Supervisor, Transmission Permitting and Compliance for Great River Energy, 17845 East Highway 10, P.O. Box 800, Elk River, MN 55330 appeared on behalf of GRE, together with Gary Ostrom, Land Rights Manager for GRE and Jerry Ellsworth, Electrical Engineer for Transmission Design for GRE. Bill Storm, Minnesota Department of Commerce – Energy Facility Permitting, 85 7th Place East, Suite 500, St. Paul, MN 55101 appeared on behalf of the Department. Bob Cupit, Routing Supervisor for the Minnesota Public Utilities Commission (Commission), 121 7th Place East, Suite 350, St. Paul, MN 55101 appeared on behalf of the Commission staff.

FINDINGS OF FACT

1. On January 12, 2007 a letter was submitted to the Commission by GRE and MP noticing their intent to submit a Route Permit Application under the Alternative Permitting Process. On March 14, 2007, GRE and MP jointly filed a Route Permit

Application for a 115 kV HVTL to be located in the Badoura area (Badoura Project).¹ The Application sought issuance of a routing permit (RP) using the alternative permitting process. The Commission accepted the filing as complete on April 3, 2007.²

2. MP and GRE propose to construct approximately 63 miles of overhead 115 kV transmission line and associated substation modifications to meet the growing electrical load of the Badoura project area. The entire permit application, maps, appendices, and other documents were made available to the public through the Energy Facility website.³ The Proposed Route is located between the endpoints of Pequot Lakes, Pine River, Badoura, Hackensack, and Park Rapids. The Proposed Route travels through Cass, Crow Wing and Hubbard counties.⁴ The Utilities indicated that three different regions would see improvements in electric service: 1) Badoura to Long Lake; 2) Birch Lake; and 3) Pequot Lakes, Pine River, and Badoura.

3. In order to maintain and improve the electric power service in the Badoura to Long Lake area, the Utilities proposed to upgrade the following facilities:

- Rebuild an existing Badoura (MP)-Long Lake (GRE) 34.5 kV line to 115 kV with some 34.5 kV underbuild in the Park Rapids area.
- Add a 115 kV line exit and associated facilities at the Badoura Substation.
- Install a second 115 kV line exit and second 115/34.5 kV transformer and associated facilities at the Long Lake Substation.
- Move Itasca-Mantrap's Park Rapids Substation to the Long Lake Substation.⁵

4. Facilities proposed to maintain and improve the electric power service in the Birch Lake area are:

- Rebuild an existing 34.5 kV Badoura - Birch Lake Tap line to 115 kV.
- Build a Birch Lake Tap to Birch Lake Substation 115 kV line (with possible 34.5 kV distribution underbuild in some sections).
- Add a 115 kV line exit and associated facilities at the Badoura Substation.

¹ Application for A Route Permit by Minnesota Power and Great River Energy Badoura 115 kV Transmission Project (Application)

(<https://www.edockets.state.mn.us/EFiling/ShowFile.do?DocNumber=3926175>).

² *ITMO the Application for a Route Permit for the Badoura 115 kV High Voltage Transmission Line and Associated Substation Under the Alternative Permitting Process*, (PUC Order, issued April 3, 2007)

(<https://www.edockets.state.mn.us/EFiling/ShowFile.do?DocNumber=3991706>).

³ The Badoura Project information is located at

<http://energyfacilities.puc.state.mn.us/Docket.html?Id=19051>.

⁴ Application (Figure 1-3).

⁵ Application, Sec. 1.2, page 1-4.

- Add 115/69 kV transformer and associated facilities at the Birch Lake Substation.
 - Convert the Tripp Lake Distribution Substation to 115 kV service.⁶
5. Facilities proposed to maintain and improve electric power service in the Pequot Lakes, Pine River, and Badoura area are:
- Build a Pequot Lakes to Pine River 115 kV line.
 - Add a 115 kV line exit and associated facilities at the Pequot Lakes Substation.
 - Convert the Pine River Distribution Substation to 115/34.5 and 115/12.5 kV service.
 - Build a Pine River to Badoura 115 kV line.
 - Add 115 kV line exits and associated facilities at the Badoura Substation.⁷

Background on the Certificate of Need Process

6. Prior the request for a route permit, on November 29, 2005, the Utilities made a joint application to the Commission for Certification of two High-Voltage Transmission Line (HVTL) projects pursuant to the provisions of Minnesota Statutes 216B.2425 and Minnesota Rules, Chapter 7848, through the Biennial Transmission Projects Report proceeding. One is the Badoura Project and the other was referred to as the "Tower project." The Tower project is for approximately 14 or 15 miles of new 115 kilovolt (kV) transmission lines, a new Embarrass switching station, and a new Tower substation located in Saint Louis County in northeastern Minnesota. The Badoura Project is the subject of this Report.

7. As part of the PUC review when a Certificate of Need (CN) for an HVTL is requested, an Environmental Report (ER) must be prepared.⁸ The Department's Energy Facility Permitting (EFP) staff prepared an ER on the Commission's behalf. The Department based its analyses on the information and data supplied in each utility's Biennial Projects Report and several other relevant sources. The Department's ER evaluated the general potential impacts from construction, operation, and maintenance of the proposed HVTL along the broad corridor(s) proposed by the applicant and discussed ways to mitigate these potential impacts. The public was given an opportunity to participate in the development of the environmental report.

8. The Department's EFP staff held a public meeting in the Badoura area. The public meeting provided the public with information about the project, afforded the

⁶ Application, Sec. 1.2, page 1-4.

⁷ Application, Sec. 1.2, page 1-4.

⁸ Minn. Rules 4410.7030.

public an opportunity to ask questions and present comments, and solicited input on the content of the ER. The comment period was held open until 5:00 p.m. January 10, 2006. On January 11, 2006, after consideration of the public comments, the Commissioner of Commerce issued an Order outlining the content of the ER in conjunction with the Commission's review procedures. On February 14, 2006, the Department issued and distributed the ER for both the Badoura and Tower projects.

9. On March 28, 2006, Administrative Law Judge (ALJ) Richard Luis from the Minnesota Office of Administrative Hearings conducted a public hearing on the issues regarding CNs for both the Tower Project and the Badoura Project. Public comments were received on the need for the proposed projects. On April 21, 2006, Judge Luis provided a summary report of comments received at the public hearing to the MPUC to assist the Commission in making a final determination on the need for the proposed transmission lines.⁹ On May 25, 2006, the PUC issued an Order certifying that the Badoura Project is needed and designating the project as a priority electric transmission project.¹⁰

Routing Permit Process

10. On April 3, 2007, the Commission ordered that Badoura project proceed under the six month alternate review process and directed the Department's Energy Facility Permitting staff (EFP) to conduct the necessary steps in the process.¹¹ The EFP staff then directed ALJ Richard Luis to conduct a public hearing. The ALJ conducted the public hearing in the evening of August 29, 2007, at the Backus City Hall, 131 King Street, Backus, Minnesota. Approximately 35 persons attended the hearing. The ALJ provided the opportunity for members of the public to air their views regarding the proposed route of the 115 kV HVTL. The period for written public comments closed on September 10, 2007. The Utilities were afforded until September 21, 2007 to file comments and proposed findings.

11. As part of the routing process, the Department prepares an Environmental Assessment (EA) which includes a public hearing to determine the scope of the EA and a later public hearing to discuss the results. On April 17, 2007, Department EFP staff held the initial public information/scoping meeting in the Backus City Hall. The purpose of the public meeting was to provide the public with information about the project, afford the public an opportunity to ask questions and present comments, and to solicit input on the content of the EA. Approximately 65 affected persons attended the meeting. The

⁹ *ITMO the Request by Great River Energy and Minnesota Power for Certification of the Badoura and Tower Transmission Lines as Priority Projects*, ET-2, E-015/TL-05-867 (ALJ Summary of Testimony at Public Hearings issued April 21, 2006)

(<https://www.edockets.state.mn.us/EFiling/ShowFile.do?DocNumber=3022455>).

¹⁰ *ITMO the Request by Great River Energy and Minnesota Power for Certification of the Badoura and Tower Transmission Lines as Priority Projects*, ET-2, E-015/TL-05-867 (Commission Order Certifying the Need and Designating as Priority Transmission Projects issued May 25, 2006)

(<https://www.edockets.state.mn.us/EFiling/ShowFile.do?DocNumber=3102250>).

¹¹ Commission Order (issued January 17, 2007)

(<https://www.edockets.state.mn.us/EFiling/ShowFile.do?DocNumber=3991706>).

comment period extended ten days after the public hearing.¹² The Commissioner of the Department issued a Scoping Decision on May 14, 2007.¹³ Due to the level of public interest at the scope hearing, Bill Storm, Project Manager for the Energy Permitting Division of the Department of Commerce, requested that the ALJ presiding over the alternative process public hearing make a report on the record developed through that hearing. The request included that the ALJ make recommendations to the Department regarding the selection of an HVTL route, the granting of a route permit and on any appropriate permit conditions that the Department may propose in preparing its comments and recommendations to the Commission.¹⁴ The Department issued the EA in July, 2007.¹⁵

Description of the Applicants

12. GRE is a not-for-profit generation and transmission cooperative based in Elk River, Minnesota. GRE provides electrical energy and related services to 28 member distribution cooperatives, including Crow Wing Power (CWP), Itasca-Mantrap Cooperative Electrical Association (Itasca-Mantrap) and Lake Country Power (LCP), the distribution cooperatives serving a portion of the area to be supplied by the proposed high voltage transmission line (HVTL). The GRE member distribution cooperatives, in turn, supply electricity and related services to more than 614,000 residential, commercial, and industrial customers in Minnesota and Wisconsin. GRE is a member of the Midwest Independent Transmission System Operator (MISO).

13. GRE's 2,679-megawatt (MW) generation system includes a mix of baseload and peaking plants, including coal-fired, refuse-derived fuel, and oil plants as well as new wind generators. GRE owns approximately 4,550 miles of transmission line in Minnesota, North Dakota, South Dakota, and Wisconsin.

14. Minnesota Power (MP) is an investor-owned utility headquartered in Duluth, Minnesota. MP supplies retail electric service to 135,000 retail customers and wholesale electric service to 16 municipalities in a 26,000-square-mile electric service territory located in northeastern Minnesota. MP generates and delivers electric energy through a network of transmission and distribution lines and substations throughout northeastern Minnesota. MP's transmission network is interconnected with the regional transmission grid to promote reliability, and MP is also a member of MISO.

Description of the Project

15. The proposed 115 kV transmission line is intended to provide more reliable electric service to the residents of the project area. Minn. Stat. § 216B.243, subd. 2, states that no large energy facility shall be sited or constructed in Minnesota

¹² Hearing Transcript, at 16 (Storm).

¹³ Department Scoping Decision

(<https://www.edockets.state.mn.us/EFiling/ShowFile.do?DocNumber=4748881>).

¹⁴ Public Hearing Transcript, at 17 (Storm).

¹⁵ Department Environmental Assessment, MP & GRE Badoura HVTL Project, (issued July 2007)(“EA”) (<https://www.edockets.state.mn.us/EFiling/ShowFile.do?DocNumber=4748881>).

without the issuance of a certificate of need by the Commission. Minn. Stat. § 216B.2421, subd. 2(3) defines a “large energy facility” as any high voltage transmission line with a capacity of 100 kV or more with more than ten miles of length or that crosses a state line. Because the proposed Badoura Project is greater than 10 miles in length, a certificate of need is required. On October 31, 2005, the Applicants submitted to the Commission under Minn. Stat. § 216B.2425, an application for Certification of a High Voltage Transmission Line as part of the 2005 Biennial Transmission Projects Report. On May 25, 2006, the Commission issued an order certifying that, “the Badoura Project is needed and is a priority electric transmission project.”

16. MP and GRE will each own specific segments of the proposed HVTL project, which is divided into a total of five segments. In addition, there will be upgrades at specific substations as described below:

15.1 Segment 1: Pequot Lakes Substation to Pine River Substation (Minnesota Power)

The line will exit the Pequot Lakes Substation to the north and then will turn west and parallel existing MP 34.5 kV and GRE 69 kV lines for approximately 2300 feet. It will then turn northerly paralleling the MP 34.5 kV line for approximately 2200 feet to the intersection with an existing 230 kV line (identified as the 91 Line and owned by MP). It will then share right-of-way with the 91 Line to near the intersection with Cass County State Aid Highway (CSAH) 1. At this point the line will proceed due north on the east side of CSAH 1 to the Pine River Substation.

15.2 Segment 2: Pine River Substation to Badoura Substation (Minnesota Power)

The new line will exit the Pine River Substation and travel south along the east side of CSAH 1 (115 kV double circuit with Pequot to Pine River 115 kV Line) for approximately 0.5 mile. It will then turn west to the south side of County Road (CR) 171 to its intersection with the 91 Line. It then proceeds northwesterly and again shares right-of-way with the 91 Line to its termination at the Badoura 115 kV Substation. MP owns the Pequot Lakes and Badoura substations and will own all the equipment additions there. Crow Wing Power (CWP) owns the existing Pine River 34.5/12.5 kV Distribution Substation and 12.5 kV distribution and will own the 115/12.5 kV transformer addition. MP will own the 115 kV bus, 115/34.5 kV transformer addition, and 34.5 kV feeders and associated equipment additions. CWP will continue to own the Pine River 12.5 kV Distribution Substation and MP will either own the land its facilities are located on or have a permanent easement for its facilities to be located within the substation with CWP. Within the new substation at Pine River, MP will own and operate all the high voltage (115 kV) facilities. MP and CWP will separately own and operate their respective low voltage distribution facilities.

15.3 Segment 3: Badoura Substation to TH 371 (Great River Energy)

GRE will own this segment of the 115 kV transmission line east out of the Badoura Substation. It will follow and replace an existing MP 34.5 kV line to a point (referred to as the 507/516 tie switch) east of TH 371.

15.4 Segment 4: TH 371 to Birch Lake Substation (Great River Energy)

This segment proceeds northerly paralleling TH 371 to its termination at the Birch Lake Substation in Hackensack. The Birch Lake Substation and the common facilities (land, fence, etc.) are owned by GRE. GRE will own all of the 115 kV equipment and MP will operate all the 115 kV facilities in the Birch Lake Substation. GRE will operate the 69 kV facilities and MP will operate the 34.5 kV facilities in this substation.

15.5 Segment 5: Badoura Substation to Long Lake Substation (Great River Energy)

GRE will own this segment of the 115 kV transmission line north and west out of the Badoura Substation. It will follow and replace an existing MP 34.5 kV line to its termination at the Long Lake Substation near Park Rapids. In the immediate vicinity of Park Rapids, there will be approximately two miles of 115 kV transmission line with a 34.5 kV distribution underbuild. The Long Lake Substation and the common facilities (land, fence, etc.) are owned by GRE. MP will operate all of the high side equipment within this substation. The proposed transmission line will be designed to meet or surpass all relevant local and state codes, and North American Electric Reliability Council (NERC) and MP and GRE standards. Appropriate standards will be met for construction and installation, and all applicable safety procedures will be followed during and after installation.

15.6 Pequot Lakes Substation

Modifications to the Pequot Lakes Substation will include a new 115 kV line entrance and modification of the existing 115 kV bus to improve reliability. This will include the addition of two 115 kV line breakers, a 115 kV bus tie breaker and associated controls. No new land will be required for these additions; however, the fenced area will be expanded by less than one acre.

15.7 Pine River Substation

Two sites are under consideration for the project's connections to the Pine River area 34.5 kV and 12.5 kV systems: an expansion at the existing Pine River Distribution Substation and relocation of the 34.5 kV facilities. The additional equipment required for the project is dependent on the final location of the 115/34.5 kV facilities. Expansion at the existing Pine River distribution substation would involve a 115 kV bus to be added with 115 kV bays to accommodate two 115 kV line exits, a 115/34.5 kV transformer, a 115/12.5 kV transformer and associated protection. In addition, a new 34.5 kV bus and two 34.5 kV feeder

exits and associated switchgear would be added, as well as a 12.5 kV bus to connect the low side of the 115/12.5 kV transformer to the existing CWP 12.5 kV bus. Lastly, a control house (approximately 20 x 24 feet) would be constructed inside the fence near the terminus of the access road. The upgraded access road would be aggregate surfaced with Class 5 material. At the new substation site, only 115 kV and 34.5 kV additions would be needed. This would include a 115 kV bus with 115 kV bays to accommodate up to three 115 kV line exits, a 115/34.5 kV transformer, and associated protection. The 34.5 kV additions would include a 34.5 kV bus and two 34.5 kV feeder exits and associated switchgear. An access road would be constructed and surfaced with Class 5 material and a control house (approximately 20 x 24 feet) would be constructed inside the fence near the terminus of the access road. In addition to the above facilities, the 34.5/12.5 kV transformer at the existing CWP Pine River Substation would be replaced with a 115/12.5 kV transformer. This would require development of a 115 kV bus, including a 115 kV line entrance and associated protection, as well as a 12.5 kV bus between the low side of the 115/12.5 kV transformer and the existing CWP 12.5 kV bus. A radial 115 kV transmission line would be constructed between the “new substation site” and the upgraded CWP distribution substation.

15.8 Badoura Substation

Additions at the existing Badoura 115 kV substation would include three new 115 kV line exits, associated bus work, circuit breakers and control facilities. In addition, existing line entrances would be reconfigured to improve area reliability and a 115 kV tie breaker will be added. No additional land would be required for the substation upgrades; however, the fenced area would be expanded by less than one acre.

15.9 Birch Lake Substation

Additions at the Birch Lake Substation include one 115 kV line exit and 115/69 kV, 60 MVA transformer and associated circuit breakers, protection and controls. To accommodate the new transformer addition and line entrance, a new 115 kV bus structure will be built and the existing transformer and 34.5 kV line exits will also have to be modified. The existing fenced-in area may be expanded by less than one acre to provide room for new 115 kV structure, transformer and 34.5 kV modifications.

15.9 Long Lake Substation

When GRE constructed the Long Lake Substation, it was designed to accommodate a second 115 kV line exit and transformer. Additions as part of this Project include bringing the proposed 115 kV line into the substation, and a second 115/34.5 kV, 50 MVA transformer and associated circuit breaker and controls. The Itasca-Mantrap Park Rapids Distribution Substation will also be

relocated to the Long Lake Substation. These substation additions will not require additional land and the fenced area is not expected to be expanded.¹⁶

17. The right-of-way (easement) width requirement for this 115 kV transmission HVTL project will range from 75 to 100 feet depending on structure design types. Single pole right-of-way requirements could be reduced in certain higher density, developed areas. The required right-of-way width may also be less in areas where the new transmission line follows an existing linear corridor such as a road or trail. MP and GRE would seek a permanent easement, providing the right to construct, operate and maintain the transmission line, for the full width and length of the right-of-way. In some select areas, additional right-of-way may be needed to accommodate longer spans or other special design requirements identified during the final survey. Right-of-way width depends on conductor blowout and the recommended clearances to obstructions along the Proposed Route.¹⁷

18. The two pole wood H-frame structure design proposed by the Utilities is suited for areas with rugged topography and/or for areas requiring longer spans to avoid or minimize placement of structures in wetlands or waterways. The average span would be 600–700 feet, with 1,000-foot spans achievable with certain topography. The structure height would average 60–80 feet with taller structures required for the exceptionally long spans and in circumstances requiring additional vertical clearance. Figure 7-1 in the Application shows a cross section drawing of a typical MP 115 kV single pole and H-Frame structures being considered for this Project. Figure 7-2 in the Application shows a cross section drawing of a typical GRE 115 kV H-Frame structure being considered for this Project. The single pole design (GRE-THP or THP-B) is suited for areas where available right-of-way is limited, such as where rights-of-way are shared along roads in developed areas. Two insulator types could be used depending on requirements: a standard post insulator (THP design) and a braced post insulator (THP-B design). The advantage of the THP-B braced post insulator design is that longer span lengths can be achieved, however structure cost is increased. Average structure height would be 65–90 feet to achieve average span lengths of 300–400 feet. Specific structure heights and span lengths may exceed the average due to land use requirements and topography. Figures 7-2 in the Application show cross section drawings of a typical GRE 115 kV single pole THP and a THP-B structure being considered for this Project. In addition to the two main structures under consideration for the Project, there may be limited use of a single pole structure with low voltage single phase or three phase distribution underbuild that directly supplies area electric customers. This single pole design is used in areas where existing land use development restricts the placement of two separate power line circuits; a high voltage circuit and a lower voltage (distribution line) circuit. The advantage of this design is less right-of-way requirement; however, there are significant operating, maintenance, and cost factors to consider. The higher voltage circuit is “stacked” on top of the lower voltage distribution circuit, resulting in a taller pole (averaging 75–90 feet in height) and

¹⁶ Exhibit 11, Department Environmental Assessment, pp. 1-4 (“EA”).

¹⁷ Application, Sec. 7-1.

shorter spans (250–350 feet). Another alternative would be to place the distribution line underground in specific areas.¹⁸

19. For Segment 5, the transmission line would utilize 795 aluminum conductor steel reinforced (ACSR) Drake conductors, which have an ampacity of 982 amps at 100 degrees C. This will limit maximum continuous electric power capacity of the line to 196 (MVA), provided there is not a more restrictive limit associated with the substation terminal equipment or transformation capacity. The line would use three single conductors (not bundled). Depending on structure type (single pole or H-frame), there would also be one or two shield wires (3/8" high strength 7-strand steel) to protect the conductors from lightning. It is likely that one shield wire would be an optical shield wire (64mm²/528 OPGW 24 fiber), to be used for communications.¹⁹

20. The right-of-way (easement area) width requirement for the 115 kV transmission project would be 100 feet for both structure design types, understanding that the width of the right-of-way cleared for the single pole designs could be reduced in certain higher density, developed areas. The width of the right-of-way cleared may also be less in areas where the new transmission line follows an existing linear corridor, such as an existing transmission line or road. MP or GRE would seek a permanent easement, providing the right to construct, operate and maintain the transmission line, for the full width and length of the right-of-way. Additional right-of-way may be required for longer spans or special design requirements based on a final survey. Right-of-way width depends on conductor blowout and the recommended clearances to obstructions along the route. Upon completion of construction activities, landowners will be contacted to determine whether or not construction damages have occurred. Areas that sustain construction damage will be restored to their pre-construction condition to the extent possible. Landowners will be notified of the completion of the Project, and asked to report any outstanding construction damage that has not been remedied or any other issue related to the construction of the transmission line. Once transmission line construction cleanup is complete and construction damages have been successfully mitigated, landowners will be sent a final contact letter signaling the close of the project and requesting notification of any outstanding issues related to the project.²⁰

Routes Analyzed in the Environmental Assessment

21. In its EA, the Department evaluated the MP and GRE Proposed Routes and the proposed substations additions. No party proposed an alternative to the proposed substation additions.

22. In the Peysenske Lake area (western portion of proposed HVTL Segment 5, several miles east of the Long Lake Substation in Henrietta Township), the Applicants proposed to utilize MP's existing 34.5 line corridor along 178th Street and CSAH 20 for the new transmission line.²¹ An approximately half mile portion of this proposed route

¹⁸ Application, Sec. 7-1; EA, p. 5.

¹⁹ Application, Sec. 7.1.3.

²⁰ Application, Sec. 8-2.

²¹ EA, Figure 4-22.

segment, along with the existing 34.5 kV line, follows CSAH 20 along the western shore of Peysenske Lake.²² The EA did not find any significant difference between the shoreland side of CSAH 20 and the western side of CSAH 20.²³

23. Both during the Biennial Transmission Projects Report certification process and the public informational/scoping meeting for the current docket, opposition to this portion of the proposed HVTL route (Segment 5) was raised by landowners around Peysenske Lake. These landowners proposed an alternative route to this portion of Segment 5. The alternative route (Alternative Route Segment 9) would turn north at 209th Avenue in Section 25, follow 209th Avenue north to TH 34, and follow TH 34 west to the intersection of CSAH 20 and TH 34, where it would once again utilize MP's existing 34.5 kV line corridor.²⁴

24. Due to the close geographic proximity and the fact the two routes follow existing road right-of-ways, both the proposed HVTL Segment 5 (Peysenske Lake portion) and the Alternative HVTL Segment 9, entail similar impacts on the natural environment. A discussion of these impacts and mitigative measures can be found in the EA. The most significant difference between these options is the number of individual properties that would be crossed; a survey (EA, Appendix E) conducted by Ulteig Engineering calculated the affected properties associated with the two options. The Alternative Route Segment 9 would impact more homeowners, create a new right-of-way (along 209th Avenue), and would add additional length along the state-designated Lake Country Scenic Byway (TH 34).²⁵

25. Minnesota Rules 7849.5530 requires an applicant for a HVTL to identify any routes that were considered and the reasons for rejecting them. The Utilities discussed routes considered and rejected in Section 4 of the Application.

Comparison Matrix

26. As requested by the ALJ at the public hearing in this matter, a comparison was prepared of the Proposed Route and the Segment 9 alternatives in the Peysenske Lake area. The comparison sets out the differences between routing that portion of Segment 5 on the Proposed Route (PR), Alternative Segment 9 North (ALT 9 N), Alternative Segment 9 South (ALT 9 S), PR with underbuild (PR UB), and PR underground (PR UG). A portion of that matrix reads as follows:

²² EA, Figure 5-1.

²³ Public Hearing Transcript, at 102 (Storm).

²⁴ EA (Figure 5-2).

²⁵ EA, Sec. 5.0, p. 46.

Segment	Length (in miles)	Trees in ROW (%)	Clearing Costs	GRE Design Cost	Total Route Cost
PR	3.47	40	\$34,700	\$34,700	\$1,182,681
ALT 9 N	4.13	58	\$59,885	\$41,300	\$1,751,445
ALT 9 S	4.08	69	\$70,380	\$40,800	\$1,477,818
PR UB	3.51	36	\$31,590	\$35,100	\$1,283,015
PR UG	3.51	36	\$31,590	\$35,100	\$1,249,554

Hearing Notices

27. Notice of the August 29, 2007 public hearing on the route permit was published in the *Brainerd Dispatch*, and the *Park Rapids Enterprise*.²⁶ The notice was mailed to landowners, public officials, media outlets, and persons who indicated an interest in HVTL matters.

28. The Commission will issue an Order on the Applicants' request for a Route Permit after examining the hearing transcripts, all written filings submitted by the public and all filings and arguments submitted by the Applicants, the Minnesota Department of Commerce and other persons and entities interested in this matter. Under Minn. R. 7849.5720, subp. 1, the decision on a routing permit must be issued within six months of the determination by the Commission that the application was complete. The Utilities agreed to an extension of that deadline, as provided for in the rule, to allow for adequate input on the Application.

Department's Environmental Assessment

29. As part of the Environmental Assessment development process, a public meeting was held on April 17, 2007 in Backus, Minnesota. The Department provided notice of the public hearing on the EA by publication and mailed notice to landowners, public officials, media outlets, and persons who indicated an interest in HVTL matters. A number of written comments were received, including a petition from the Peysenske Lake Association.²⁷

30. The EA detailed the work needed to be performed for the Project, potential impacts and mitigation measures. No significant impacts requiring extraordinary

²⁶ An Affidavit of publication for the *Brainerd Dispatch* was pending at the time this Report was completed. The *Park Rapids Enterprise* Affidavit is available through E-dockets at:

<https://www.edockets.state.mn.us/EFiling/ShowFile.do?DocNumber=4782153> .

²⁷ Available through E-dockets at:

<https://www.edockets.state.mn.us/EFiling/ShowFile.do?DocNumber=4799109> .

mitigation measures were identified in the EA. Mitigation measures were detailed for the limited impacts (and potential impacts) caused by the Project.²⁸

31. The EA was exceptionally thorough and detailed. Many of the Findings in this Report are drawn directly from that document. As with the companion routing proceeding for the Tower Project, the Department staff should be commended for their efforts in preparing the EA.

Summary of Public Hearing Testimony

32. Approximately 35 persons attended the public hearing in this matter. Bill Storm, Planning Director with the Department of Commerce's Energy Facilities Permitting Group made a presentation regarding the Department's environmental review process for the Badoura Project.²⁹ Representatives of MP and GRE attended the hearing to address issues raised by the public. Robert Cupit, Routing Supervisor for the Commission, explained the Commission's role in the routing application process.

33. Gordon Kramer of Walden Township requested that the portion of Segment 2 traveling west from the Pine River Substation be located on the south side of County Road 171. The Utilities proposed a 3,000 foot corridor at that portion of Segment 2. Locating the line in the northern half of the corridor (the part north of C.R. 171) would adversely affect nine homes. Two of the homes are very close to C.R. 171 on the north side. Kramer recommended that the route follow the existing power line along the south side of C.R. 171.³⁰ That placement affects four home sites, rather than nine, and would displace far fewer trees. MP noted that the intention was to follow the existing power line, but the flexibility to vary the particular route within the 3,000 foot corridor was important to the Utilities.³¹

34. Raymond Peterson of Backus noted that the description of a portion of Segment 3 in the Application did not accurately reflect the street names. There is no dispute regarding the route at that location, since it follows the existing MP 507 line. Peterson also urged GRE to consider existing trees and irrigation systems when revising the existing easement to allow for an upgrade of the power line.³²

35. Perry Melbo of Park Rapids expressed his opposition to the alternative routes proposed by a homeowner's group in the Peysenske Lake area. He noted that the Proposed Route affected 16 homes in that area while the alternate route comes within 500 feet of 37 homes. Additionally, the Proposed Route uses the existing 34.5 kV power line route, which follows the fence line of farm fields. The alternate route would require significant tree cutting along roadways.³³ Carole Schmidt of GRE

²⁸ Environmental Assessment, July, 2007 (<https://www.edockets.state.mn.us/EFiling/ShowFile.do?DocNumber=4748881>)(links to Appendices omitted).

²⁹ Public Hearing Transcript, at 15-19 (Storm).

³⁰ Public Hearing Transcript, at 51-56, 61 (Kramer); EA, Appendix E; Exhibit 18.

³¹ Public Hearing Transcript, at 57-60 (Atkinson).

³² Public Hearing Transcript, at 62-73 (Peterson).

³³ Public Hearing Transcript, at 74-83 (Melbo).

confirmed that the Proposed Route would replace the existing 34.5 kV line with a 115 kV line, with the result that only one power line would occupy the route, which is the current situation.³⁴

36. Steve Kopkie of Park Rapids (and a near neighbor of Mr. Melbo), expressed his opposition to the alternative route along Highway 34 in the Peysenske Lake area. He noted that the alternate route would require cutting many mature growth trees, including 100 year-old red pines. Kopkie expressed concern about the impact of the alternate route on residents' quiet enjoyment of their property and the detrimental impact on property values.³⁵

37. Les Hagemeyer, President of the Peysenske Lake Association (comprised of land owners with access rights to that lake), noted that the existing 34.5 kV power line has been in place since 1952. The concerns of riparian owners on that lake is that the creation of a new right of way will establish a public access to Peysenske Lake. The existing right of access is limited to the 26 riparian owners and 12 backlot owners. Hagemeyer asserted that the Proposed Route, as indicated on the Applicants' maps, would cross a portion of the lake adjacent to CSAH 20, and be built on the lake side of CSAH 20, which would combine to establish a right of public access to the lake, immediately off the highway.³⁶

38. The ALJ noted that the creation of a right of access to public waters was not within the jurisdiction of the Commission or the ALJ.³⁷ However, the Commission can properly consider the concerns of landowners that a particular route may result in consequences outside of the Commission's jurisdiction when determining whether to approve a particular route or impose conditions on that approval.

39. GRE offered to accommodate the affected landowners by moving the 115 kV line across CSAH 20, which would remove the HVTL from the lakeshore side of the road and prevent the power line from crossing Peysenske Lake at any point.³⁸ The Department pointed out that this alternative was noted as acceptable in the EA.³⁹ Hagemeyer questioned whether the line would be routed to the west (across the highway, away from the lake) or whether that were merely a possibility. In addition, he sought clarification as to whether GRE intended to underbuild the facilities (placing both the 115 kV and the distribution lines on the same poles), or bury the 115 kV line along that portion of CSAH 20.⁴⁰

40. Jerry Ellsworth, Electrical Engineer for GRE, noted that either underbuilding or trenching was possible for placement of the 115 kV line on the west (non-lake) side of CSAH 20, but that trenching of transmission lines was typically five to

³⁴ Public Hearing Transcript, at 80 (Schmidt).

³⁵ Public Hearing Transcript, at 83-87 (Kopkie).

³⁶ Public Hearing Transcript, at 87-101 (Hagemeyer).

³⁷ Public Hearing Transcript, at 124 (ALJ).

³⁸ Public Hearing Transcript, at 101-105 (Schmidt).

³⁹ Public Hearing Transcript, at 102 (Storm); EA p. 5-12..

⁴⁰ Public Hearing Transcript, at 110-113 (Hagemeyer).

seven times more expensive than overhead lines. Most of that cost lies in termination structures, which can cost between \$100,000 and \$150,000.⁴¹ Since the cost information was not available at the hearing, the ALJ directed that GRE provide that information, which is set out in the Cost Matrix in an earlier Finding.

41. Robert Cupit, Routing Supervisor for the Commission, sought clarification of the reasons for the Utilities' proposal to place the new 115 kV line off of the centerline of the existing 34.5 kV line, at several points along the Proposed Route.⁴² GRE explained that these variations from the existing power line were the result of discussions with landowners and based on the need to accommodate each landowner's specific situation.

Summary of Written Comments

42. The only written comment was submitted by email by Henry and Mary Buerkley. The commentators expressed agreement with Segment 5 of the Proposed Route as set out in the Application at page 5-19, Fig. 5-15 of Sec. 5 and page 5-11, Sec.5.2.5. The Buerkleys urged that the route remain as proposed on the north side of 174th Street. They maintained that this location resulted in a reduced environmental impact to an ecologically sensitive area, the route avoided occupied buildings, and the Utilities would have easier access for both installation and maintenance of the power line.⁴³

Regulatory Considerations in Route Permitting

43. When issuing a route permit, the Commission has been directed to consider specific impacts and make particular evaluations of the potential effect of the proposed HVTL. Under Minn. Stat. § 216E.02, the Commission must be guided by the following responsibilities, procedures, and considerations:

(a) Evaluation of research and investigations relating to the effects on land, water and air resources of large electric power generating plants and high voltage transmission lines and the effects of water and air discharges and electric and magnetic fields resulting from such facilities on public health and welfare, vegetation, animals, materials and aesthetic values, including baseline studies, predictive modeling, and evaluation of new or improved methods for minimizing adverse impacts of water and air discharges and other matters pertaining to the effects of power plants on the water and air environment;

(b) Environmental evaluation of sites and routes proposed for future development and expansion and their relationship to the land, water, air and human resources of the state;

⁴¹ Public Hearing Transcript, at 117-119 (Ellsworth).

⁴² Public Hearing Transcript, at 137-145 (Cupit).

⁴³ Buerkley Email Comment, September 7, 2007.

- (c) Evaluation of the effects of new electric power generation and transmission technologies and systems related to power plants designed to minimize adverse environmental effects;
- (d) Evaluation of the potential for beneficial uses of waste energy from proposed large electric power generating plants;
- (e) Analysis of the direct and indirect economic impact of proposed sites and routes including, but not limited to, productive agricultural land lost or impaired;
- (f) Evaluation of adverse direct and indirect environmental effects that cannot be avoided should the proposed site and route be accepted;
- (g) Evaluation of alternatives to the applicant's proposed site or route proposed pursuant to subdivisions 1 and 2;
- (h) Evaluation of potential routes that would use or parallel existing railroad and highway rights-of-way;
- (i) Evaluation of governmental survey lines and other natural division lines of agricultural land so as to minimize interference with agricultural operations;
- (j) Evaluation of the future needs for additional high voltage transmission lines in the same general area as any proposed route, and the advisability of ordering the construction of structures capable of expansion in transmission capacity through multiple circuiting or design modifications;
- (k) Evaluation of irreversible and irretrievable commitments of resources should the proposed site or route be approved;
- (l) When appropriate, consideration of problems raised by other state and federal agencies and local entities;
- (m) If the board's rules are substantially similar to existing regulations of a federal agency to which the utility in the state is subject, the federal regulations must be applied by the board;
- (n) No site or route shall be designated which violates state agency rules.⁴⁴

44. In addition to the foregoing considerations, the Commission is governed by Minn. Rule 7849.5910, which requires that the Commission be guided by the following specified siting and routing considerations:

- (a) Effects on human settlement, including, but not limited to, displacement, noise, aesthetics, cultural values, recreation, and public services;

⁴⁴ Minn. Stat. § 216E.02, subd. 7.

- (b) Effects on public health and safety;
- (c) Effects on land-based economies, including, but not limited to, agriculture, forestry, tourism, and mining;
- (d) Effects on archaeological and historic resources;
- (e) Effects on the natural environment, including effects on air and water quality resources and flora and fauna;
- (f) Effects on rare and unique natural resources;
- (g) Application of design options that maximize energy efficiencies, mitigate adverse environmental effects, and could accommodate expansion of transmission or generating capacity;
- (h) Use or paralleling of existing rights-of-way, survey lines, natural division lines, and agricultural field boundaries;
- (i) Use of existing large electric power generating plant sites;
- (j) Use of existing transportation, pipeline, and electrical transmission systems or rights-of-way;
- (k) Electrical system reliability;
- (l) Costs of constructing, operating and maintaining the facility which are dependent on design and route;
- (m) Adverse human and natural environmental effects which cannot be avoided; and
- (n) Irreversible and irretrievable commitments of resources.

45. The Application and the EA provide sufficient information for the Commission to assess the proposed route and alternatives using the criteria set out above. Specific considerations that merit more attention in determining a particular route are discussed below.

Impact on Human Uses

46. The Applicants described their estimate of the effects of the proposed Project on human settlement in Section 6.2 of the Application. The EA has a similar discussion in Section 4.6 of the EA. Neither the Proposed Route and associated substations nor the proposed alternatives result in any displacement of existing

residences. The Department noted that the use of existing power line right of way results in no impacts to existing uses, including the Paul Bunyan and Heartland Trails.⁴⁵

47. Visual impacts are discussed in Section 4.3 of the EA. The Department noted that 91 percent of the HVTL will follow existing right-of-way and therefore will not create a significant new visual impact. The EA included comparisons of the existing visual impact and renditions of how the upgraded line will appear. From communities near the Proposed Route, the Department concluded:

There are three communities within one mile of the proposed route: Pequot Lakes, Pine River and Hackensack. Park Rapids is approximately a mile and a half from the western end of the Proposed Route; therefore, it will be difficult to view the transmission line from Park Rapids. The degree to which the structures are visible from Pequot Lakes, Pine River and Hackensack will vary depending on elevation and the proximity of the transmission line to each town.⁴⁶

48. For areas away from those communities along the PR, the Department concluded:

The project is not expected to impact viewers within the Badoura and Foothills State Forests because the project would be built along existing rights-of-way through the forests, and the change to structures would be minimal. Review of field data and aerial photography indicates that approximately 168 homes are located within 500 feet of the proposed route alignment. However, due to the forested nature of the project area, many of these homes do not have a clear line of sight to the transmission line.⁴⁷

49. The Utilities undertook to determine specific location of structures, right-of-way and other disturbed areas along the authorized route to reduce the visual impact on landowners. The Department listed measures that will minimize or eliminate the modest visual impacts. No mitigation was deemed needed for recreational uses.⁴⁸

Impacts on Public Health and Safety

50. The Utilities have proposed that the Badoura Project will be constructed to comply with the National Electrical Safety Code (NESC).⁴⁹ The issue of electromagnetic fields (EMF) was discussed in the EA in Section 4.13. EMF, which are present around any electrical device, have been the subject of much discussion regarding potential human health effects. The intensity of the electric field is related to the voltage of the line and the intensity of the magnetic field is related to the current flow

⁴⁵ EA, Sec. 4.6, p. 27.

⁴⁶ EA, Sec. 4.3, p. 24.

⁴⁷ *Id.*

⁴⁸ *Id.*, pp. 26-27.

⁴⁹ Application, Sec. 6.2.1, pp. 6-1 to 6-2.

through the conductors. Both magnetic and electric fields decrease in intensity with increasing distance from the source.

51. Currently, there is insufficient evidence to demonstrate a causal relationship between EMF exposure and any adverse human health effects. On the basis of the most current information available and expert advice of the Interagency Workgroup on EMF led by the Minnesota Department of Health, no Minnesota regulations have been established pertaining to magnetic fields from HVTLs. No significant impacts on human health and safety are anticipated from the Badoura Project.⁵⁰

52. Normal construction noise can be expected during the installation of transmission line structures. The Department concluded that these operations will be of short duration and will be conducted during the daylight hours to minimize any residential impact. The noise impacts are the same regardless of the route selected. (EA, Section 4.3) During operation, audible noise from the power line occurs due to point source corona. The noise level is not expected to approach the limits established under the Minnesota noise control rules, even under the most adverse conditions.⁵¹

53. The Birch Lake Substation was determined to pose the most significant increase in noise among the substation changes in the Badoura Project. While the Birch Lake Substation will experience a noticeable increase in audible noise, the noise levels will remain below the Minnesota NAC Area 1 standards at locations beyond 225 feet from the transformers. The closest home to that substation is located over 300 feet away. For this reason, the Department concluded that no significant adverse impacts will be associated with the increase in audible noise from the substation and that no noise mitigation was needed.⁵²

54. The Department concluded that interference with existing television or radio is typically not a problem with 115 kV transmission lines. The proposed transmission facilities will be designed to industry standards to avoid interference with reception. If a new interference occurs outside of the right-of-way the Department recommended that the Applicants be required to resolve the problem as a condition of the HVTL Route Permit.⁵³

55. Limited lengths of new right-of-way will be required for the Badoura Project. Needed right-of-way that is not already in the possession of the Utilities will either be obtained through individual negotiations between the particular Utility and the landowner, or through eminent domain.

⁵⁰ EA, Section 4.13, pp. 41-44.

⁵¹ EA, Section 4.2.

⁵² EA, Section 4.2.

⁵³ EA, Section 4.14.

Impacts on Land-based Economies

56. The impacts on land-based economies arising from the proposed HVTL are discussed in Section 4.6 of the EA. The Department assessed the proposed route for the HVTL and new substation siting for potential effects on agriculture, forestry, and mining. No impacts were found regarding mining. The Department estimated that 18 percent of the Proposed Route is presently in agricultural uses. Applicants estimate permanent impacts associated with structures to agricultural lands at approximately 0.05 acres. If the Pine River Substation is relocated, less than 1.5 acres of agricultural land could be permanently impacted. Approximately 84 percent of the permanent impacts to agricultural lands will occur on prime farmland soils, prime farmland when drained, or soils of statewide importance.⁵⁴

57. The Department noted that the Applicants will compensate landowners for any crop damage or soil compaction that may occur during construction. The Department recommended that a condition of the HVTL Route Permit should require the Applicants to work with landowners to minimize impacts to farming operations along the proposed route. Those impacts are minimized by aligning the transmission line along existing transmission and roadway corridors.⁵⁵

58. The Department noted that Northern Minnesota contains economically important forestry industries. The Badoura State Forest has a MDNR-managed 200-acre state nursery, where Norway pine, jack pine, white pine, white spruce, black spruce, black walnut, green ash, red oak, silver maple and wild plum are cultivated (citing Lake Country Scenic Byway Organization, 2006). The nursery is located west of TH 64 at the intersection with TH 87 (citing MDNR, 2004: State Forest Boundaries). The proposed route also crosses Foothills State Forest, although no forestry production occurs within that state land.

59. The Department concluded that the proposed route will not impact the Badoura Nursery. The proposed route will be built within existing right-of-way through the Badoura and Foothills State Forests. No privately-owned forest production industry will be affected by the Project. Impacts along the proposed route to forested areas and shelterbelts are estimated at 133 acres.

60. The Department recommended that mitigation of the impacts be accomplished by conditioning the HVTL Route Permit on locating and arranging construction staging areas to preserve trees and vegetation to the maximum practicable extent. The preferred locations are previously disturbed sites such as abandoned parking lots. Unless otherwise agreed upon by the landowner, all storage and construction buildings, including concrete footings and slabs, and all construction materials and debris will be removed from the site once construction is complete. The area will be graded as required so that all surfaces drain naturally, blend with the natural terrain, and are left in a condition that will facilitate natural revegetation, provide for

⁵⁴ EA, Section 4.6, pp. 27-28.

⁵⁵ EA, Section 4.6, p. 29.

proper drainage, and prevent erosion. Clearing for access should be limited to only those trees necessary to permit the passage of equipment, and will generally correspond to the transmission right-of-way corridors. If temporary access roads outside of the right-of-way corridors are necessary, they should be restored to native vegetation. Native shrubs that will not interfere with the safe operation of the transmission line should be allowed to reestablish in the right-of-way. The Department also recommended that the Applicants, as a condition of the HVTL Route Permit, coordinate with the MDNR to determine the best avoidance and minimization measures to use in state-owned forested parcels along the proposed route.⁵⁶

Impacts on Archaeological and Historic Resources

61. The State Historic Preservation Office (SHPO) provided database search results of all known or reported archaeological sites and historic architectural structures in the sections that are within one-quarter mile of the Proposed Route. Within these sections, the database lists six archaeological sites and six historic architectural structures. Of these known resources, there are no archaeological sites or architectural structures listed on or currently considered eligible for listing in the National Register of Historic Places (NRHP). Most of the historic structures are within the corporate limits of the towns in the area, most notably Pine River and Pequot Lakes.

62. Because the SHPO database is organized by county, the database search results of nearby historic and archaeological sites are similarly presented in the EA at Table 4-4 and Table 4-5, which show cultural resources within one-quarter mile of the Proposed Route. It is important to note that most of the sites shown have not been evaluated as to their historical significance and that there may be other resources within the sections along the Proposed Route that have not yet been identified. However, the existence of the sites and resources listed here demonstrates that the region was attractive to and used by people throughout history. The archaeological sites listed range from the Archaic Period (6,000 - 800 years B.C.) to the Historic Period, with most falling within the Woodland Period (1000 B.C – 1700 A.D). In general, historic properties or structures must be at least 50 years old to be significant. In the area, these include civic buildings, bridges and farmsteads.

63. Because the Proposed Route is in the right-of-way of existing lines and is adjacent to highways for the vast majority of its length, the likelihood that archaeological resources will be affected is relatively low because the corridor has already been disturbed by the previous construction of the roadway and the existing line. In areas not previously disturbed and where archaeological potential is assessed to be high, unrecorded archaeological sites may be affected during construction of transmission structures, substations and substation expansions, maintenance structures, staging areas or access roads. Historic buildings or other sites may be impacted as well; in that construction of modern transmission structures may compromise the integrity of a historic viewshed from or to aboveground archaeological and historic resources.

⁵⁶ EA, Section 4.6, p. 30.

However, because there are lines already in place, a significant visual change is not anticipated.

64. In a letter dated November 29, 2006, and in previous correspondence related to the Certificate of Need Application, the State Historic Preservation Office (SHPO) indicated that cultural resource surveys of the proposed project area would be needed.⁵⁷ The Utilities have agreed that this requirement should be imposed as a condition of the HVTL Route Permit if granted by the Commission.

65. The Utilities have undertaken to avoid impacts to identified archaeological and historic resources. In the event that an impact would occur, the Applicants will consult with SHPO and invited consulting parties (particularly Native American Tribes and other state and federal permitting or land management agencies) on whether or not the resource is currently listed on or eligible for listing in the National Register of Historic Places (NRHP). While avoidance of the resource would be a preferred action, mitigation for project-related impacts on NRHP eligible archaeological and historic resources may be required. In consultation with SHPO and other consulting parties, treatment plans will be developed that may include an effort to minimize project impacts on the resource, and/or additional documentation through data recovery.

Impacts on the Natural Environment

66. The Proposed Route is located within the Northern Minnesota Drift and Lake Plains section of the Ecological Classification System (EA, Section 4.7). The area is generally flat to gently rolling. Kettle lakes and lakes greater than 160 acres are common throughout. Elevations generally range between 1,250 and 1,500 feet across the project area. The lowest elevation is 1,232 feet near Pine River, and the highest elevation is 1,565 feet between the Badoura Substation and TH 371.

67. The project lies within the Pine Moraines and Outwash Plains subsection of the Northern Minnesota Drift and Lake Plains section. This subsection is characterized by end moraines, outwash plains, till plains and drumlin fields. Sands and sandy loam soils overlay Quaternary drift materials that are approximately 200 to 600 feet thick. Precambrian bedrock is generally granite, gneiss and slate (USGS, 1968 and 1972). The soils found in the project area are generally moderately well-drained to excessively well drained sandy loams or loamy sands, with poorly-drained muck soils found in the large wetland depressions. USDA Natural Resource Conservation Service (NRCS) Soil Survey data were reviewed to describe the soil resources along the Proposed Route. Soils are generally grouped into categories known as associations. A soil association has a distinctive pattern of soils, relief and drainage, and is a unique natural landscape. Typically, an association consists of one or more major soils and some minor soils. Soil disturbance will result from site clearing and excavation activities at structure locations, pulling and tensioning sites, substations and setup areas and during transport of crews, machinery, materials and equipment over access routes (primarily along transmission right-of-way). Construction of the transmission line is

⁵⁷ EA, Appendix C (<https://www.edockets.state.mn.us/EFiling/ShowFile.do?DocNumber=4749093>).

expected to result in approximately 552 acres of temporary impact and 11,700 square feet (0.27 acres) of permanent impact to soils. If the Pine River Substation is relocated, construction will result in less than 1.5 acres of permanent impact to soils.

68. The Utilities have undertaken to perform mitigative measures to address known impacts arising from the Project. Disturbed areas will be graded to existing conditions. No impacts to regional topography will result from the Project. The project will not impact the geology of the project area. Potential impacts of construction are soil compaction and exposing the soils to wind and water erosion. Impacts to physiographic features should be minimal during and after installation of the transmission line structures and the substation and switching station, and these impacts will be short term. There should be no long-term impacts resulting from the project. Soils will naturally re-vegetate following construction disturbance. In areas subject to erosion, seeding/mulching of the right-of-way may be required to minimize that impact. Areas of larger disturbance (one acre or more), particularly at the substation and switching station sites, will be addressed in the National Pollution Discharge Elimination System (NPDES) and Stormwater Pollution Prevention Plan (SWPPP) prepared for the project. Mitigation under the NPDES includes implementation of the SWPPP with the appropriate erosion control methods developed specifically for the site. The Minnesota Pollution Control Agency's (MPCA) Stormwater Program is designed to reduce the pollution and damage caused by stormwater runoff. MPCA has three stormwater programs for regulating stormwater runoff from three main sources: construction, industrial and municipal. The MPCA issues combined NPDES/State Disposal System (SDS) permits for construction sites, industrial facilities and municipal separate storm sewer systems. Compliance with the MPCA stormwater program will be a condition of the HVTL Route Permit.

69. Vegetative communities within and surrounding the proposed HVTL routes and substation sites are primarily comprised of forested uplands, forested wetlands, and herbaceous wetland communities common to north central Minnesota. Nearly all of the forest cover is second growth and much of it is subject to timber management including clear-cutting, plantings, and growth management practices. MP and GRE have indicated that they will work with affected residents to minimize the need to remove or trim nearby vegetation, although the company will have to do what is necessary to safely construct and maintain the line regardless of the route selected. In other places, vegetation may be planted to alleviate some of the loss of mature tree growth.

70. Water resources along the Proposed Route are shown in the detailed route maps in Figures 4-7 to 4-22 of the EA. Groundwater resources in the project area include a buried Quaternary aquifer (comprised of glacial outwash deposits) and, to a much lesser extent, Cretaceous and Precambrian bedrock aquifers that are scattered throughout. In general, groundwater quantity and/or accessibility is not a problem in the study area. Groundwater (water table, near surface) resources may be encountered during excavations for transmission line structures in low-lying and/or wet areas. Depth to water table varies throughout the project area, from less than five feet to over 50 feet, but generally is found within 25 feet of the surface. In general, groundwater in the project area is relatively good, with chemical levels similar to or lower than those found

in similar aquifers elsewhere in Minnesota (MPCA, 1998). It is possible that project construction would require dewatering. If dewatering is necessary during construction (i.e., during pole embedding), the effects on water tables would be localized and short-term. The project will have no impact on either municipal or private water uses in the project area. No water storage, reprocessing or cooling is required for either the construction or operation of the transmission line or substations. Therefore, the project will not result in violations of groundwater quality standards. The majority of the Proposed Route lies within the Pine River and Crow Wing River watersheds of the Upper Mississippi River Basin. A portion of the Proposed Route near Hackensack is in the Leech Lake River watershed of the Upper Mississippi River Basin. Within the portion of the corridor in Hubbard County and near Pequot Lakes, surface water flows generally towards the Crow Wing River; within the middle portion of the project area the water generally flows towards the Pine River. At the northern terminus of the Proposed Route, surface water generally flows north, ultimately reaching Leech Lake.

71. The Proposed Route crosses forested riparian areas associated with several creeks and streams, including Pine River, Crow Wing River, Behler Creek, Wallingford Creek and Wilson Creek. The portions of Hubbard, Cass and Crow Wing counties within the project area have not been mapped for floodplains by the Federal Emergency Management Agency. It is possible that the Proposed Route crosses the 100-year floodplains associated with the Crow Wing River, Pine River, and/or Hay Creek, as well any floodplains associated with the lakes in the vicinity. Public Waters are water basins and watercourses of significant recreational or natural resource value in Minnesota as defined in Minnesota Statute 103G.005. The MDNR has regulatory jurisdiction over these waters. The Proposed Route crosses six Public Water Inventory (PWI) lakes (five in Cass County and one in Hubbard County), three PWI wetlands (all in Hubbard County) and nine PWI creeks and rivers (seven crossings in Cass County and two in Hubbard County).⁵⁸

72. No navigable water of the United States will be affected by the project; therefore no USACE Section 10 permit will be required.

73. Wetlands are defined by the United States Army Corps of Engineers (USACE) as “Waters of the U.S.” and are subject to jurisdiction under Section 404 of the Clean Water Act (1973). Waters of the U.S. include both wetlands and non-wetlands that meet USACE criteria. In Minnesota, all wetlands are regulated under the Wetland Conservation Act (see Minnesota Statute §§103G.222-.2373 requiring coordination with Minnesota Board of Water and Soil Resources (BWSR)) and by the USACE under Section 404 of the Clean Water Act.

74. Wetland resources for the Proposed Route were identified by reviewing United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) mapping. NWI wetlands are shown on Figures 4-7 to 4-23. There are 74 NWI wetlands along the Proposed Route (primarily palustrine scrub/shrub and palustrine emergent wetlands), as listed in the EA in Table 4-7.

⁵⁸ EA, Figures 4-7 through 4-22, and Table 4-6.

75. USACE Section 404 approvals are not expected to be required for this project. Some minor impacts to surface water resources could occur to wetlands or Public Waters due to construction of the project. However, the Applicants anticipate that most wetland areas and surface water features, such as rivers and streams, will be avoided by spanning the transmission line over the water bodies. There are 11 NWI basins (two of which are also PWI basins) that are wider than the maximum span along the Proposed Route where complete avoidance may not be feasible. It is estimated that approximately 23 structures will be placed in NWI wetlands, for a temporary impact of approximately 3,400 square feet (0.08 acres) and a permanent impact of approximately 560 square feet (0.01 acres). Table 4-8 in the EA shows the PWI wetlands wider than the maximum span along the Proposed Route, the estimated number of structures that may be placed within each PWI, and the estimated temporary and permanent impacts per water body.

76. Rebuilding in-place or paralleling the existing transmission lines that currently skirt the majority of the hydrologic features will minimize any new impacts to wetlands and water bodies. Construction of the transmission line is not expected to alter existing water drainage patterns or floodplain elevations due to the small cross section per pole and the relatively wide spacing of the poles. Although construction of the proposed substations will involve a small increase in impermeable surfaces (from the control houses and structure footings), the change to local surface drainage patterns from this and any necessary grading is expected to be negligible. The small area of impermeable surfaces created by the pole structures and substation outbuildings will not cause an increase in susceptibility to flooding in the region.

77. The MPCA lists several impaired waters in the project area on its 2006 Impaired Waters List. The Proposed Route crosses the Crow Wing River and Mud Lake, which are both impaired for mercury and fecal coliform. Long Lake, Tamarack Lake and Birch Lake are within a mile of the Proposed Route. Long Lake and Tamarack Lake are impaired for mercury and fecal coliform, and Birch Lake is impaired for excess nutrients. Construction of the project will not cause loading of nutrients, mercury or fecal coliform into the impaired waters within the project area.

78. The Utilities have committed to mitigative measures to assure minimal impact to groundwater. If dewatering is necessary, dewatered groundwater will be properly stored and sediments will be settled out and removed before the water is discharged. As a condition of the HVTL Route Permit, standard erosion control measures and best management practices (BMP) will be required to minimize potential impacts.

79. If the Pine River Substation is relocated, proposed construction activities at the site would result in the disturbance of one acre or more of soils and a National Pollutant Discharge Elimination System (NPDES) stormwater permit would be required. A Stormwater Pollution Prevention Plan (SWPPP) would be prepared that would include erosion control plans and BMPs that would be implemented. To minimize contamination of water due to accidental spilling of fuels or other hazardous substances, all construction equipment would be equipped with spill cleanup kits.

80. Impacts to floodplains, in particular the placement of power poles or structures, will be avoided to the maximum extent by placing these structures above the floodplain contours outside of the designated floodplain, and by spanning the floodplain with the transmission line. Because proposed construction activities at the substation and switching station will result in the disturbance of one acre or more of soils, a National Pollutant Discharge Elimination System (NPDES) stormwater permit will be required. A Stormwater Pollution Prevention Plan (SWPPP) will be prepared that will include erosion control plans and BMPs that will be implemented. To minimize contamination of water due to accidental spilling of fuels or other hazardous substances, all construction equipment would be equipped with spill cleanup kits. The wood poles used for this Project will be pretreated with pentachlorophenol or creosote to increase the wood durability and life expectancy of the poles. Degradation of these wood preservatives occurs through aerobic soil degradation, aerobic and anaerobic aquatic degradation, and photolysis. However, the respective half-life for these processes range from less than 20 minutes to 63 days, the preservatives are not very mobile in soil or water, and are subject to biodegradation to its elemental state near the pole. Therefore, there will be no long-term impacts from the use of these preservatives.

81. The Badoura Project will have no significant adverse air quality impacts.⁵⁹ During construction of the Project, there will be emissions from vehicles and other construction equipment and fugitive dust from the right-of-way clearing. Temporary air quality impacts caused by the proposed construction-related emissions are expected to occur during this phase of activity. There will be no impact on air quality during operation of the lines. No mitigative measures for air quality are necessary for the construction of the transmission line.⁶⁰

Impacts on Rare and Unique Natural Resources

82. The Department reviewed the Minnesota Department of Natural Resources (MDNR) Natural Heritage Information System (NHIS) for potential occurrences of state-listed rare, threatened, or endangered species and sensitive natural resources within the proposed HVTL route and substation sites. The proposed route is within one mile of rare or unique resources including three recorded occurrences of bald eagles, a federally threatened, state special status species; four recorded occurrences of Blanding's turtles, a state threatened species; and nine occurrences of greater prairie chickens, two occurrences of least darter minnows and one occurrence of a yellow rail, all state special status species. Two occurrences of currently not listed species for which the MDNR is gathering more data are within a mile of the proposed route. One is a great blue heron rookery and the other is a Jack Pine – (Yarrow) Woodland natural community.⁶¹

83. The Department concluded that no impacts to special status species are expected as a result of this project since the vast majority of the project is along or

⁵⁹ Application, Section 6.5; EA, Section 4.11.

⁶⁰ EA, Section 4.11.

⁶¹ EA, Section 4.9, Table 4-3

parallel to existing transmission line and/or roadway right-of-way. The only measures in mitigation deemed needed were conditions of the HVTL Route Permit requiring the Applicants to maintain sound water and soil conservation practices during construction, operation of the project to protect topsoil and adjacent water resources, and to minimize soil erosion and sedimentation. Maximizing spans through wetlands would minimize the number of poles placed in the wetlands, thereby avoiding or minimizing disturbance to terrestrial and aquatic habitats for special status species. Where construction of the transmission line requires access outside of the existing right of way, that access should be conditioned on avoiding the vicinity of the great blue heron colony.

Application of Design Options to Maximize Energy Efficiencies, Mitigate Adverse Environmental Effects, and Accommodate Expansion of Transmission Capacity

84. The Utilities indicated that there are no plans to add additional transmission capacity along the Proposed Route. For this reason, the Utilities assert that the design is appropriate to this Project and maximizes energy efficiency. MP and GRE have undertaken to work with affected landowners to use a design that mitigates the impact on them and the right-of-way. The Pine River Substation will be laid out to accommodate additional equipment (such as additional transmission line terminations, capacitor banks, transformers, and related feeders) should significant load growth occur in the area. Although no specific plans have been made, the Utilities noted that construction of the site in a manner that accommodates future growth will eliminate the need for a new substation site in the future.

85. The proposed design is appropriate to this project, maximizes energy efficiency, and accommodates future expansion. MP and GRE have undertaken to work with the affected landowners to use a design that mitigates the impact on the affected landowners and the right-of-way.

Using or Paralleling Existing Rights-of-Way and Other Boundaries

86. As noted in foregoing Findings, the Applicants' Proposed Route uses existing rights-of-way for 91 percent of the total HVTL length. Where the existing right of way has not been followed, the Utilities explained that the changes were made to accommodate landowners.

Electrical System Reliability

87. The Badoura Project will increase distribution reliability by providing new substation capacity in the vicinity of the load growth. This increased capacity will provide needed voltage support and ensure that voltage can be maintained within acceptable levels. The Project will result in shorter distribution feeders, thereby improving reliability by reducing exposure. This also provides back up capacity for other substations in the event of outages, both planned and unplanned. The Project will also provide a much needed second 115 kV transmission source to the Long Lake and Pequot Lakes substations. This will improve transmission reliability and allow continued

service to all electrical customers served from these substations in the event that a 115 kV transmission line goes out of service. The Badoura Project will improve the electrical system reliability for the local distribution system as well as for the transmission system.⁶²

Design and Route Dependent Costs

88. The Applicants estimated that the cost of constructing, operating, and maintaining the facility along the Proposed Route is no higher, and is likely to be lower than along alternative routes. The Proposed Route relies on existing rights-of-way to the extent technically and economically feasible, thereby reducing the cost of acquiring easements and right-of-way preparation.⁶³

Unavoidable Adverse Human and Natural Environmental Effects

89. The Applicants indicated that the only identified environmental effects that cannot be avoided occur during the construction of the line and substation. Where any archeological sites are identified during placement of the poles along the proposed route or construction of the substation, the particular site will be avoided. Native vegetation will be maintained within the proposed route that is compatible with the operation and maintenance of the transmission line. Where necessary, native species will be planted or seeded in areas that are devoid of native species. Soils will be revegetated as soon as possible to minimize erosion or some other method will be used during construction to prevent soil erosion. During construction temporary guard or clearance poles are installed at crossings to provide adequate clearance over other utilities, roads, highways, or other obstructions after any necessary notifications are made or permit requirements met to mitigate any concerns with traffic flow or operations of other utilities.⁶⁴

Irreversible and Irretrievable Commitments of Resources

90. The proposed route and the alternatives do not require any irreversible or irretrievable commitment of resources. The Applicants noted that in the event the HVTL or the substation were to be removed at some time in the future, there is nothing related to their proposed placement that would prevent or require a different use of resources in the future.⁶⁵

Comparison of Proposed Routes

91. Through the course of the public participation in this proceeding, there were two issues raised regarding the Applicants' Proposed Route. Gordon Kramer of Walden Township requested that the portion of Segment 2 traveling west from the Pine River Substation be located on the south side of County Road 171 in order to avoid a

⁶² Application, p. 11-4.

⁶³ Application, p. 11-4.

⁶⁴ Application, p. 11-5.

⁶⁵ Application, p. 11-5.

number of residences on the north side of CR 171. The Applicants responded that the intention was to follow the existing power line on the south side of CR 171. The requested approval of the corridor (including the area north of CR 171) was to ensure flexibility. The Applicants have not shown that a need for flexibility is reasonable when it potentially might allow an HVTL outside of an existing right of way and over a greater number of residences. Retaining that flexibility is reasonable once the HVTL is past those residences and nearing the existing corridor that will take the PR to the northwest.

92. The other routing issue was raised by the Peysenske Lake Association concerning the possible opening of access to the lake if the HVTL was sited on the east side of CSAH 20. The Association proposed Alternative Segment 9, which would route the HVTL north at 209th Avenue in Section 25, follow 209th Avenue north to TH 34, and follow TH 34 west to the intersection of CSAH 20 and TH 34, where it would once again utilize MP's existing 34.5 kV line corridor.

93. The Utilities offered to meet the Association's need by following the distribution line on the west side of CSAH 20 through the sensitive portion of the Peysenske Lake area. The line would be either underbuilt on new, taller poles, or placed underground parallel to the existing distribution structures.

94. The Segment 9 alternative raises the cost of this segment between \$295,000 and 570,000. Up to 37 residences will be affected using that alternative. Significant loss of trees, particularly mature growth trees, would result using that alternative. The impact of the loss of trees is particularly acute along TH 34, which is the Lake Country Scenic Byway.

95. By contrast, the Utilities' proposal to move the line to the west of CSAH 20 adds only \$67,000 (underground) to \$100,000 (underbuilt) to the cost of the project. There are few residences on the west side of CSAH 20 that would be affected, and those residences currently have a distribution line in the location that the HVTL would be placed. The Applicants have shown that their proposed route, modified by moving the 115 kV line to the west side of CSAH 20 is reasonable and minimizes adverse impacts. The choice of underbuilding or running the line underground should be left to the installing Utility.

96. While not an alternative route, the Applicants should ensure description of the route in Segment 3 accurately reflects the street names. There is no change proposed in the route at that location, which is the existing MP 507 line.

Based on the Findings of Fact, the Administrative Law Judge makes the following:

CONCLUSIONS

1. The Public Utilities Commission, the Department, and the Administrative Law Judge have jurisdiction to consider the joint application by MP and GRE for a Routing Permit.

2. The Public Utilities Commission determined that the Application by MP and GRE for a Routing Permit was substantially complete and accepted the Application for a Routing Permit on April 3, 2007.

3. The Applicants have conducted an appropriate Environmental Assessment consistent with Minn. Rules 7852.2100 to 7852.4100 and met the requirements for Alternative Environmental Review in Minn. Rule 4410.3600.

4. A public hearing was conducted in a community located along the proposed HVTL route. The Applicants gave proper notice of the public hearings, and the public was given the opportunity to appear at the hearings or to submit public comments. All procedural requirements for the Routing Permit were met.

5. The Applicants have demonstrated by a preponderance of the evidence that the Proposed Route is reasonable and prudent, with two adjustments, one to remain south of CR 171 near Pine River in Cass County while in the vicinity of residences along that county road and the other to follow the west side of CSAH 20 in the immediate vicinity of Peysenske Lake. The one proposed alternative, Segment 9, is not as reasonable as the Applicants' Proposed Route.

6. The Routing Permit should require MP and GRE to comply with their proposed wetland impact avoidance measures and those set out in the EA during design and construction of the transmission line, including spacing and placing the power poles at variable distances to span and to avoid wetlands. Unavoidable wetland impacts as a result of the placement of poles will be limited to the immediate area around the poles. As much as possible of the construction in wetland areas will occur in the winter to minimize impacts. Where needed, MP and GRE will use construction mats to protect wetland vegetation. MP and GRE will meet all requirements of the USACE, the MDNR (Public Waters/Wetlands), and each affected County (for wetlands under the jurisdiction of the Minnesota Wetland Conservation Act).

7. The Routing Permit should require MP and GRE to obtain a National Pollutant Discharge Elimination System (NPDES) stormwater permit, prepare a Stormwater Pollution Prevention Plan (SWPPP), and follow project construction specifications for site sediment control, where such requirements are appropriate.

8. The Routing Permit should require MP and GRE to comply with those practices set forth in the Route Permit Application and the Environmental Assessment for right-of-way preparation, construction, cleanup, restoration and maintenance.

9. The Routing Permit should require MP and GRE to obtain all required local, state and federal permits and licenses, to comply with the terms of those permits or licenses, and to comply with all applicable rules and regulations.

10. The Routing Permit should require MP and GRE to obtain all necessary permits authorizing access to public rights-of-way and to obtain approval of landowners for access to private property.

11. The Routing Permit should require that MP and GRE contact landowners prior to entering the property or conducting maintenance along the route and avoid maintenance practices, particularly the use of fertilizer or pesticides, inconsistent with the landowners' or tenants' uses of the land.

12. The Routing Permit should require MP and GRE to work with landowners to locate the HVTL on their properties to minimize the loss of agricultural land, forest, and wetlands, with due regard for proximity to homes and water supplies, following property lines and minimizing diagonal crossings, even if the deviations will increase the cost of the HVTL, so long as a landowner's requested relocation does not adversely affect environmentally sensitive areas.

13. The Routing Permit should require MP and GRE to work with landowners, the DNR, and local wildlife management programs to restore and maintain the right-of-way to provide useful and functional habitat for plants, nesting birds, small animals and migrating animals and to minimize habitat fragmentation in a manner consistent with inspection and safe maintenance of the right-of-way.

14. The Routing Permit should require MP and GRE to negotiate agreements with landowners that will minimize the impact on future development of the properties, and to assume any additional costs of development that may be the result of installing roads, driveways and utilities that must cross the right-of-way.

15. The Routing Permit should require MP and GRE to cooperate with all entities that have existing easements or infrastructure within the route to ensure minimal disturbance to existing or planned developments.

16. The Routing Permit should require MP and GRE to make every effort to avoid impacts to identified archaeological and historic resources when installing the HVTL on the approved route and undertake cultural resource surveys, where needed. In the event that such an impact would occur, it is appropriate to require the Applicants to consult with SHPO and invited consulting parties. Where feasible, avoidance of the resource should be required. Where such avoidance is not feasible, mitigation for project-related impacts on NRHP-eligible archaeological and historic resources must include an effort to minimize project impacts on the resource.

17. The Routing Permit should require MP and GRE to establish complaint handling procedures and to notify the PUC of those procedures within thirty days from the issuance of the Routing Permit. MP and GRE should notify the Commission of any complaints that are not resolved within 30 days of the complaint.

18. Any Finding of Fact that constitutes a Conclusion is adopted as a Conclusion.

Based on the Conclusions, the Administrative Law Judge makes the following:

RECOMMENDATION

IT IS RECOMMENDED that the Department recommend to the Commission that:

Subject to the conditions set forth in the Conclusions, the Application of MP and GRE for an HVTL Route Permit for the Badoura 115 kV Transmission Project, following Proposed Route, with adjustments at the Peysenske Lake area and restrictions as described to the south side of CR 171, should be GRANTED.

Dated this 12th day of October, 2007.

/s/ Richard C. Luis

RICHARD C. LUIS

Administrative Law Judge

Reported: Rapid Reporting – Nancy M. Utke, RPR
Transcript Prepared (One Volume)

NOTICE

This project qualifies for alternative review by the Minnesota Public Utilities Commission. The PUC was not required to hold a contested case hearing on this project pursuant to chapter 14, and it did not do so. Under PUC rules, the PUC has the option to conduct a public hearing itself or to request that an Administrative Law Judge conduct the hearing and compile a record for the PUC to consider in making its final decision. The Department of Commerce has the option to request that the Administrative Law Judge prepare a report and recommendation, which it did in this case. This report contains a summary of the evidence in the record and a recommendation based on that record. It is not a final decision. Persons wishing to file comments concerning this report with the Department of Commerce should contact Bill Storm, Minnesota Department of Commerce, 85 Seventh Place East, Suite 500, St. Paul, MN 55101-2198, for information about the procedures to be followed. Further notice is hereby given that the Department of Commerce may, at its own discretion, accept or reject the Administrative Law Judge's recommendation.



MINNESOTA OFFICE OF ADMINISTRATIVE HEARINGS

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October 12, 2007

Bill Storm
Minnesota Department of Commerce
Energy Facility Permitting
85 7th Place East, Suite 500
St. Paul, MN 55101

BY EMAIL AND EFILING

Dear Mr. Storm:

Please find enclosed and served on the Department of Commerce and the Public Utilities Commission through the E filing system the ALJ Findings of Fact, Conclusions and Recommendation for In the Matter of the Application for a High Voltage Transmission Line Route Permit for the Badoura 115 kV Transmission Project, ET2, E015/TL-07-76, OAH Docket No. 7-1000-19158-2. An email copy has been sent for convenience and copied to representatives of the Utilities and the Commission. Hard copies of the documents submitted through the public hearing process will be returned under separate cover.

Sincerely,

/s/ Michael W. Lewis

MICHAEL W. LEWIS
Staff Attorney

Telephone: 651/361-7840

Encl.