

11. SUMMARY OF FACTORS TO BE CONSIDERED IN EVALUATING THIS APPLICATION

MP and GRE have applied for a Route Permit for a 115 kV HVTL that is needed to meet the energy needs of MP and GRE customers located in the project area. The HVTL's two endpoints will be the new Tower Substation and the new Embarrass Switching Station.

The role of the Commission is to determine the best route to follow to accomplish those requirements, and to determine what mitigation efforts GRE and MP should employ to reduce any environmental consequences. Minn. Rules 4400.3150 lists 14 factors to consider in determining whether to issue a permit for the Proposed Route. Those factors are discussed briefly below.

A. Effects on human settlement, including but not limited to, displacement, noise, aesthetics, cultural values, recreation, and public services.

Effects of the Project on human settlement are discussed in Section 6.2 of this Application. The Proposed Route and associated substation and switching station result in no displacement of existing residences. The noise from the transmission line, substation, and switching station will be minimal (Section 6.2.3). The majority of the Proposed Route is located on unoccupied lands, a portion of the route is along an existing recreational/snowmobile trail, and a section is along a county road with an existing single phase distribution line. The proposed transmission line and associated substation and switching station will have no impact on cultural values, recreation, or public services.

B. Effects on public health and safety.

The Project will be constructed to comply with RUS standards, as well as the NESC. Questions often arise about electric and magnetic fields (EMF), which are invisible lines of force that surround any electrical device. The term EMF refers to electric and magnetic fields that are coupled together, such as in high frequency radiating fields. Electric and magnetic fields are discussed in Section 7.5 of this Application. The transmission line meets the EQB standard imposing a maximum electric field limit of 8 kV per meter at one meter above ground. That standard was implemented to mitigate serious hazard from shocks when touching large objects parked under transmission lines with voltage of 500 kV or greater. The proposed 115 kV line will have a maximum magnitude of electric field density of approximately 1.5 kV per meter underneath the conductors one meter above ground level. Research on the biological effects from electric fields on animals and humans has shown no significant association with disease in humans.

Magnetic fields result from the flow of electricity (current) in the transmission line. Recent studies of the health effects from power frequency fields conclude that the evidence of health risk related to magnetic fields is weak.

The values of the magnetic field for the proposed 115 kV single circuit transmission line are:

- In 2009, under expected normal maximum peak load conditions (30 MVA or 151 amps), the 115 kV transmission line would have a peak value of 40 milligauss (mG) directly underneath the transmission line and a value of approximately 8.5 mG at the edge of the right-of-way (assumes GRE proceeds with addition of 115/69 kV facilities).
- Under maximum steady state operating conditions (Power flow limited to 95 MVA or 477 amps due to total transformer capacity after addition of 115/69 kV GRE transformer) the 115 kV transmission line would have a peak value of 125 mG directly underneath the transmission line and a value of approximately 26 mG at the edge of the right-of-way.

The magnetic field strength due to normal load conditions will typically increase over time because the power flowing on the line increases as load growth occurs. The maximum magnetic field for the Project as proposed (including the 69 kV additions planned by GRE) will be limited by the capacity of the transformers located in the substation. Additional information on magnetic and electric fields can be found in Section 7.5.

C. Effects on land-based economies, including but not limited to, agricultural, forestry, tourism, and mining.

The Proposed Route for the transmission line would not significantly impact any prime agricultural, commercial forestry or mining property, nor is the route located in an area where tourism would be affected (see Section 6.3 of this Application).

D. Effects on archaeological and historic resources.

The Height of Land Portage (National Register of Historic Places – ID#92000842) is located at the south end of the project area, predominantly in White Township. The Proposed Route location was aligned to avoid crossing the “portage.” The proposed Embarrass Switching Station site is located in the vicinity of the “portage.” A Phase I field survey of the switching station site did not uncover any cultural resources. Further, the removal of the existing steel lattice switching structure located close to the “portage” will minimize any impacts on the “portage.”

E. Effects on the natural environment, including effects on air and water quality resources and flora and fauna.

The transmission line and associated substation and switching station will not affect air or water quality (Section 6.5). It will only affect flora within the cleared area of the right-of-way. The fauna also will not incur a long-term effect from the transmission line, substation, or switching station.

F. Effects on rare and unique natural resources.

The MDNR and the USFWS determined that the Project will not affect any rare or unique natural resources (Sections 6.5.4 and 6.5.5; and Appendix C).

G. Application of design options that maximize energy efficiencies, mitigate adverse environmental effects, and could accommodate expansion of transmission capacity.

There are no known, or likely plans to add additional 115 kV (or greater) transmission capacity along the Proposed Route. Therefore, the design is appropriate to this Project and maximizes energy efficiency. GRE has plans to permit and construct a 69 kV transmission line from the Tower Substation that will travel west to serve increasing load in the west Lake Vermilion area. The Tower Substation has been sized and designed to accommodate the addition of the future 115/69 kV transformer, 69 kV transmission line termination structure, and associated substation equipment.

MP and GRE will work with the affected landowners to design the Project's facilities to mitigate the impact on the affected landowners and the right-of-way.

H. Use or paralleling of existing rights-of-way, survey lines, natural division lines, and agricultural field boundaries.

The Proposed Route uses or parallels existing rights-of-way and survey lines where possible. Route Area 1 follows the Iron Ore Trail right-of-way for the entire distance (4.3 miles). Route Area 2 follows this same trail for 1.3 miles, survey lines (1/16 line) for 1.4 miles, and the Bergstedt Road and distribution line right-of-way for 2.2 miles. Route Area 3 follows survey lines for 1.1 miles. Route Area 4 follows a transmission line right-of-way for 0.8 miles and survey lines for 2.8 miles.

In total, transmission line rights-of-way are followed for 0.8 miles, roads (with distribution right-of-way) for 2.2 miles, the snowmobile trail for 5.6 miles, and survey lines for 5.3 miles; totaling 13.9 miles of the 14.2 mile route (98%).

I. Use of existing large electric power generating plant sites.

This criterion is not applicable.

J. Use of existing transportation, pipeline, and electrical transmission systems or rights-of-way.

See the comments under part H above.

K. Electrical system reliability.

The Project will improve electrical system reliability for the local distribution systems as well as the area transmission system. Distribution reliability is enhanced by providing new substation capacity in the vicinity of the load growth.

Transmission reliability is increased by the addition of a third transmission source to the area transmission system. Under single contingency situations (a major transmission component—line or substation—is not available for service) resulting from either planned maintenance or unplanned emergency outages, the transmission system will have sufficient capacity to serve the present and future loads of MP and LCP in the area. This is critical for the area's reliability, especially during outages of existing transmission lines. The 115 kV line is inherently more reliable than the existing 46 kV lines due to increased ground clearance and insulation levels, and is superior to all of the transmission alternatives identified in the Certification Alternatives Analysis.

L. Costs of constructing, operating, and maintaining the facility which are dependent on design and route.

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 uses existing rights-of-way and public lands to the extent technically and economically feasible. This reduces the cost of acquiring easements and right-of-way preparation.

M. Adverse human and natural environmental effects which cannot be avoided.

The only identified environmental effects that cannot be avoided are primarily short-term during the construction of the transmission line, substation, and switching station. If any archaeological sites are identified during the Phase I field survey preceding the placement of the poles along the Proposed Route or construction of the stations, the particular site will be avoided. Native vegetation will be maintained within the right-of-way that is compatible with the operation and maintenance of the transmission line. If necessary, native species will be seeded in areas that are prone to soil erosion. During construction, temporary guard or clearance poles are installed at crossings to provide adequate clearance over other utilities, streets, roads, highways, railroads, 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).

N. Irreversible and irretrievable commitments of resources.

The Proposed Route does not require any irreversible or irretrievable commitment of resources. Should the transmission line and/or substations be abandoned and removed at some time in the future, there is nothing related to their earlier placement that would prevent or require a different use of resources in the future.

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