

**OAH: 5-2500-39600**  
**PUC: E-015/CN-22-607**  
**E-015/TL-22-611**

**STATE OF MINNESOTA  
OFFICE OF ADMINISTRATIVE HEARINGS  
FOR THE  
PUBLIC UTILITIES COMMISSION**

In the Matter of the Application of Minnesota  
Power for a Certificate of Need for the HVDC  
Modernization Project in Hermantown, Saint  
Louis County

In the Matter of the Application of Minnesota  
Power for a Route Permit for a High Voltage  
Transmission Line for the HVDC  
Modernization Project in Hermantown,  
Saint Louis County

**MOTION FOR RECONSIDERATION  
OF DENIAL OF INTERVENTION OF  
WORLD ORGANIZATION  
FOR LANDOWNER FREEDOM**

World Organization for Landowner Freedom, hereinafter “W.O.L.F.” hereby makes this Motion for Reconsideration of the denial of W.O.L.F.s’ Petition for Intervention. W.O.L.F again requests granting of Intervention in the Certificate of Need and Routing docket. If deemed necessary, W.O.L.F. could limit its intervention to the specific issue of the EQB Ordered 800 MVA limitation and the means necessary to present and develop this issue. W.O.L.F. is the only party concerned about and focused on this issue, the only party with a long and involved history of administrative intervention and participation regarding this issue in the years-long prior Arrowhead Transmission Project dockets. W.O.L.F.’s participation and development of the record over years represents a significant commitment and interest, with that outcome demanding preservation. W.O.L.F. will abide by the schedule in the Prehearing Order and will not delay the proceedings, and will work to weigh in and inform the record in this proceeding.

The Order Denying [W.O.L.F.’s} Petition to Intervene stated, “That matter apparently

relates to the present substation at issue. W.O.L.F. claims its contribution to the outcome of the case before the EQB was the requirement that only low-noise transformers be used at the substation.” W.O.L.F. made no such claim. This statement is not correct. The condition of importance, emphasized by W.O.L.F. in its Petition, is the 800 MVA limitation. While W.O.L.F. did paste and cite the two EQB conditions into its Petition, and noise was first. However, the 800 MVA limitation was the other condition, and the 800 MVA limitation was the focus of W.O.L.F.’s Petition, interest, and concern. The EQB Order stated regarding the 800 MVA limitation, included in W.O.L.F.’s Petition, and attached in full:

2. The second bullet of Finding No. 11 is amended to read and a new footnote 18A is added to read:

Adding four single-phase 345/230 kilovolt transformers to interface with the 345 kV line. These transformers step up the voltage from 230 kV to 345 kV. The approximate rating of these transformers is 800 MVA. [18A]

18A. Transcript at 1874.

10. Minnesota Power shall apply to the Minnesota Environmental Quality Board under section 116C.57 for authorization to make any changes in the Arrowhead substation that would allow Minnesota Power to increase the capability of the substation to transmit power over the transmission line beyond 800 MVA.

See Attachment A, pages 1-20 of Minnesota Power’s September 29, 2023 Response to ATC, MP’s Attachment 1, 2001 EQB Order, pps. 16-20.

W.O.L.F. was very clear in its identification of the 800 MVA limitation as its primary concern, its reason for its Petition for Intervention:

*W.O.L.F.’s concern and interest, as stated in its Petition, is in the Arrowhead-Weston Transmission Project’s EQB exemption conditions, in particular, the Arrowhead substation’s 800 MVA limitation. This concern and interest was triggered by ATC’s “alternative” proposal which would circumvent that limitation<sup>1</sup>. ATC’s disregard for the Environmental Quality Board’s condition in*

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<sup>1</sup> Again, we have suspicions, but do not know ATC’s intent in submitting this “alternative.”that intent can and should be explored in these HVDC dockets.

*Exemption of the Arrowhead Project, and disregard for Minnesota Power's purpose of the HVDC Modernization Project, offering as an "alternative" something that has no relation to either, is nothing but a literal power grab by ATC. Because this bizarre "alternative" was accepted by Commerce-EERA, and is advancing through environmental review, W.O.L.F.'s concern regarding the conditions of the EQB's Arrowhead exemption, and its aim to preserve the conditions, W.O.L.F.'s interest is a specific, legitimate, and logical interest, not raised by others.*

W.O.L.F. Petition, p. 3. W.O.L.F.'s concern and interest was raised by the actions and filings of ATC and its promotion of an "alternative" that would circumvent the 800 MVA limitation and defeat the purpose of that EQB limitation, gutting the EQB's Order. The EQB's 800 MVA limitation and W.O.L.F.'s interest in preservation of that limitation is specifically raised eight (8) times in W.O.L.F.'s Petition to Intervene and could not have been more specific.

Based on the language in the Order of Denial, it bears stating clearly that the EQB's 800 MVA limitation is **NOT** a noise limitation.<sup>2</sup> The 800 MVA limitation – 800 megavolt amperes - is a restriction of the energy that can flow from the Arrowhead substation's phase shifting transformer into Wisconsin on the Arrowhead Transmission Line.

The 800 MVA limitation of energy flowing through the phase shifting transformer in the Arrowhead substation into Wisconsin is stated twice in the EQB Order, both as a matter of physics -- an electrical transformer rating, and as a matter of law – a limitation that may not be exceeded without an application to exceed that capacity. The EQB's Order was filed in the HVDC Modernization Project dockets by Minnesota Power and then W.O.L.F., and in the interest of clarity, it is attached again at the end of Attachment A, Minnesota Power's Response to ATC<sup>3</sup>.

Given the record thus far in the HVDC Modernization Project dockets, there should be no confusion about the meaning of "800 MVA limitation." The 800 MVA limitation at the

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<sup>2</sup> Industrial noise is a completely separate issue and is subject to the MPCA's noise rules, found in Minn. R. 7030.0040. But again, the 800 MVA Arrowhead substation limitation is not about noise.

<sup>33</sup> Attachment A is pages 1-20 of Minnesota Power's September 29, 2023 Response to ATC.

Arrowhead substation and the history and rationale for this limitation were carefully explained by Minnesota Power in its September 29, 2023 Response to ATC<sup>4</sup>. The “800 MVA” limitation is specifically cited eight (8) times in MP’s Response<sup>5</sup>, with narrative expounding in page after single-spaced page of explanation of the 800 MVA limitation and various nuances of it related to ATC’s “alternative” proposal. What more is needed?

Again, W.O.L.F.’s interest is in preserving the 800 MVA limit via the Arrowhead Phase Shifting Transformer, and opposing ATC’s “alternative,” in assuring it is not deemed a plausible “alternative” option, and rejecting it as a permissible choice for the Public Utilities Commission.

W.O.L.F. was very clear in its Petition for Intervention that **THE** issue of concern for W.O.L.F. was preservation of the 800 MVA limitation – the phrase “800 MVA” is found seven times in W.O.L.F.’s Petition in setting out its interest in these dockets.

As stated previously, there’s no requirement of provision of “substantive information about who or what it is” in statute or rule. ATC casts aspersions on W.O.L.F., and the Order states that “W.O.L.F. has provided no substantive information about who or what it is,” yet the footnote states it has:

*The Judge was able to determine this through a link Petitioner Provided in its Response to ATC’s objection, not through any statement by Petitioner in its filings.*

Order, fn. 4, p. 2. There is substantive information. The Arrowhead Transmission Project dockets provide additional substantive information, well known to both ATC and Minnesota Power. W.O.L.F. is a known quantity to Minnesota Power, which acknowledges the active participation of W.O.L.F. in opposing MP’s Arrowhead Transmission Project. Minnesota Power, the applicant, stated for the record that it had no objection to the intervention of its former

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<sup>4</sup> Attachment A, MP’s September 29, 2023 Response to ATC, pps. 2-4 filed in these two dockets, plus pps. 3, 6, 7, 8, 10, 11..

<sup>5</sup> Id., pps. 3, 6, 7, 8(x2), 10 and 11.

adversary W.O.L.F in these H VDC dockets, and MP made no claim of any prohibitive overlapping of interest. No other party represents W.O.L.F.'s interest in preservation of the 800 MVA limitation. Minnesota Power's statement of "no objection" should be given great weight.

Conversely, it's apparent ATC does not want W.O.L.F. participating – presumably because of W.O.L.F.'s historical and regulatory knowledge in this area, and intervention over the years to oppose the Arrowhead Project after ATC took it over from WPS.

Regarding the question of "who or what W.O.L.F. is," W.O.L.F. did link its Wisconsin organizational record (W042335).<sup>6</sup> Neither LIUNA's group, nor the Large Power Intervenors' group have provided their organizational documents, and apparently their statements of "who or what" they are, is sufficient. Is it that those intervenors are a "known quantity," or that they are large funded corporate entities? W.O.L.F. is the sole grassroots entity requesting intervention.

And as the Large Power Intervenors note, "While the weighing of these factors is left with the Administrative Law Judge, 'it is an abuse of discretion to deny intervention to one whose interest is substantial, who may be adversely affected, and whose interests are not adequately represented by existing parties.'<sup>7</sup> W.O.L.F.'s interest and long-term investment of effort in the 800 MVA limitation may be adversely affected, and its privilege as a vigorous intervenor and its measure of success in working toward limitation of bulk power transfer is at risk with the ATC "alternative" included in environmental scoping. By forcing its way into these dockets, and pushing a late-filed and unusual "alternative" into scoping that has no relation to the purpose of this HVDC Project, ATC's actions show that this is a situation of ATC's making. ATC doesn't want additional scrutiny of its "alternative," and in particular, additional scrutiny

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<sup>6</sup> Online at: <https://www.wdfr.org/apps/corpsearch/Results.aspx?type=Simple&q=W042335>

<sup>7</sup> Large Power Intervenors, citing "William J. Keppel, Minnesota Practice, Administrative Practice & Procedure § 9.16.4, Westlaw (2d ed., database updated Oct. 2021)."

by W.O.L.F.

The Minnesota Public Utilities Commission must allow and foster public participation:

The commission shall adopt broad spectrum citizen participation as a principal of operation. The form of public participation shall not be limited to public hearings and advisory task forces and shall be consistent with the commission's rules and guidelines as provided for in section [216E.16](#).

Minn. Stat. §216E.08 Public Participation.<sup>8</sup>

W.O.L.F again requests Intervention, at the very least intervention in the Certificate of Need and Routing dockets limited to the specific issue W.O.L.F. has raised, that of ATC's "alternative" and the preservation of the EQB Ordered 800 MVA limitation, and W.O.L.F. requests participation sufficient to present and develop this issue. W.O.L.F. will work to inform the record in this proceeding, as it has conscientiously in the previous Arrowhead dockets, and will abide by the schedule in the Prehearing Order. W.O.L.F. will not delay the proceedings.



January 22, 2024

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<sup>8</sup> Based on experience, this writer is not confident in sufficiency of participation if W.O.L.F. is not an intervenor. In the past, a directly affected client missed early participation because they were not sent notice, confirmed by Affidavit of Mailing, then was denied intervention, and then also denied ability to question witnesses and comment at the hearing. In another docket, this writer represented NoCapX 2020, which was expressly denied intervention on the basis that other Intervenor would represent NoCapX's interest, but instead of challenging the project, they promoted transmission. In a rate case, this writer was, as a ratepaying individual, denied intervention, and then at the public hearing was denied opportunity to question witnesses. Public participation is too often unreasonably limited. The Office of Legislative Auditor's report, "Public Utilities Commission's Public Participation Processes" reflects the Public Utilities Commission's shortcomings: <https://www.auditor.leg.state.mn.us/ped/2020/puc2020.htm>



September 29, 2023

**VIA ELECTRONIC FILING**

Will Seuffert  
Executive Secretary  
Minnesota Public Utilities Commission  
121 Seventh Place East, Suite 350  
St. Paul, MN 55101

Re: *In the Matter of the Application of Minnesota Power for a Certificate of Need  
for the HVDC Modernization Project*  
MPUC Docket No. E015/CN-22-607

*In the Matter of the Application of Minnesota Power for a Route Permit  
for the HVDC Modernization Project*  
MPUC Docket No. E015/TL-22-611

**Minnesota Power's Response to Route Alternative and Conditions  
Proposed to be Evaluated in the Environmental Assessment**

Dear Mr. Seuffert:

Minnesota Power (or the "Company") respectfully responds to the alternative proposed by the American Transmission Company LLC, by and through its corporate manager, ATC Management Inc. (collectively, "ATC"), in its September 15, 2023 written comments submitted during the environmental assessment ("EA") scoping comment period for the High-Voltage Direct-Current ("HVDC") Modernization Project ("Project") in the above-referenced dockets. On September 20, 2023, Minnesota Power requested the opportunity to respond to ATC's proposed alternative, or any other proposed alternative submitted by the close of the comment period, by September 29 pursuant to Minn. R. 7850.3700, subp. 2(B). In this response, Minnesota Power provides an analysis of the alternative proposed by ATC, what it calls the "Arrowhead Alternative," that was put forth for evaluation in the EA.<sup>1</sup> Based on this analysis, Minnesota Power recommends that the Minnesota Public Utilities Commission ("Commission") decline to require EERA to include the Arrowhead Alternative in the EA. Additionally, Minnesota Power provides its responses to comments of the Minnesota Department of Natural Resources ("MnDNR") ("MnDNR Comments").

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<sup>1</sup> ATC also recommended that the EA "identify and delineate" the environmental impacts and cost estimates associated with certain interconnection facilities associated with the Project. Minnesota Power does not address these recommendations in this response.

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Minnesota Power makes two separate requests with respect to ATC's Arrowhead Alternative and the MnDNR Comments. First, Minnesota Power respectfully requests that the ATC Arrowhead Alternative not be evaluated in the EA. As discussed in more detail below, ATC's Arrowhead Alternative, on its face, is an unnecessarily complex alternative endpoint and interconnection voltage alternative that does not serve the need of the HVDC Modernization Project. Further, implementation of the Arrowhead Alternative would introduce tremendous risk for the Project, would result in more significant environmental impacts than the proposed HVDC Modernization Project, and would be more costly for Minnesota Power and its customers. Finally, Minnesota Power requests that the commitments outlined below in response to the MnDNR Comments be included in the EA.

### **ATC Arrowhead 345 kV/230 kV Substation Background**

The ATC Arrowhead 345 kV/230 kV Substation was initially constructed as part of the Arrowhead – Weston Project which includes the Arrowhead-Weston 345 kV transmission line that runs 12 miles from the Arrowhead Substation near Duluth to the Minnesota-Wisconsin border, and then continues southeast approximately 208 miles through Wisconsin to the Weston Substation near Wausau, Wisconsin. The Arrowhead-Weston Project was developed in the late 1990s to increase electric system reliability in the Minnesota and Wisconsin region. Specifically, as a result of two contingency events on the regional transmission system in the late 1990s, it became apparent that the Minnesota/Wisconsin electric interface was a weak link in the regional system that needed to be addressed. In addition, regional studies conducted at the time showed that a high voltage line connecting Minnesota to Wisconsin was important to improving regional reliability.

Resolving this weak link was important to Minnesota Power and its customers. Despite the fact that roughly 95 percent of the Arrowhead-Weston Project is in Wisconsin, Minnesota Power determined that it was appropriate to participate and sponsor the Minnesota portion of the Arrowhead-Weston Project to enhance service reliability to Minnesota Power's customers, and to the State and region.

Minnesota Power worked with Wisconsin Public Service ("WPS") and others in the Wisconsin Reliability Assessment Organization ("WRAO"), to develop options that could help strengthen the interface and improve system stability. The WRAO included regulators, utilities, and Mid-Continent Area Power Pool staff from Minnesota, Iowa, Wisconsin, and Illinois. In September 1999, Minnesota Power applied for authorization to construct the 12-mile Minnesota portion of the Arrowhead-Weston Project and began the process of obtaining necessary permits to construct and operate the line. In November 1999, WPS and Minnesota Power jointly applied for authorization from the Wisconsin Public Service Commission to construct the 208-mile 345 kV line through Wisconsin.



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In March 2001, the Minnesota Environmental Quality Board ("EQB") granted Minnesota Power's requested exemption from the Minnesota Power Plant Siting Act.<sup>2</sup> That exemption authorized construction of the Minnesota portion of the Arrowhead-Weston Project upon receipt of other federal, State, and local permits necessary to build the line in Minnesota with the condition that the Arrowhead 345 kV/230kV Substation could not be used to "transmit power . . . beyond 800 MVA." At the time that Minnesota Power and WPS began developing the Arrowhead-Weston Project, Minnesota Power planned to undertake both the construction and initial ownership of the Minnesota portion of the Arrowhead-Weston Project, including the Arrowhead 345 kV/230 kV Substation, and would also own a portion of the line in Wisconsin.

As the project progressed in planning and development, the regulatory structure of the transmission system was undergoing significant change. Minnesota Power and WPS joined MISO and their respective transmission operations became subject to the MISO Open Access Transmission Tariff ("OATT"). Also, the State of Wisconsin recognized its greater need for additional transmission and generation infrastructure; certain legislative changes were made in Wisconsin that resulted in transmission assets being divested by Wisconsin public utilities, like WPS, and unified within an independent transmission company, which became ATC. ATC began operations in January 2001, joining MISO and operating pursuant to MISO's OATT.

In light of these changes, ATC assumed WPS's role in developing, owning, and operating the Wisconsin portion of the Arrowhead-Weston Project. ATC had overall responsibility for construction of the line as the ultimate owner and operator. As a result of the industry changes and in light of ATC's responsibility to permit, construct, own, and operate the Wisconsin portion, Minnesota Power and ATC determined that ATC should also own and operate the Minnesota portion of the Arrowhead-Weston Project, including the Arrowhead 345 kV/230 kV Substation endpoint.<sup>3</sup> In 2004, Minnesota Power made a filing under Minn. Stat. § 216B.50 before transferring any ownership interests related to the Arrowhead-Weston Project to ATC.<sup>4</sup> After a lengthy process with multiple parties, the Commission issued an order in December 2005 granting the transfer from Minnesota

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<sup>2</sup> MEQB Docket No. MP-HVTL-EA-1-99 (Mar. 19, 2001). **Attachment 1.** The EQB, at the time, had authority for issuing route permits or exemption determinations for high-voltage transmission lines. The EQB granted an exemption request that authorized construction of the 12 miles of the Arrowhead-Weston Project that were to be located in Minnesota upon obtaining other federal, state, and local permits necessary for the project. Under the law in effect at the time, no certificate of need or other Commission approval was required to proceed. *In re Exemption Application by Minn. Power for a 345/230 kV High Voltage Transmission Line Known as the Arrowhead Project*, No. C4-01-1022, 2002 WL 46991 (Minn. Ct. App. Jan. 15, 2002).

<sup>3</sup> Because ATC owned the entire Arrowhead-Weston Project, it was able to include the full cost of the project in its rate base for cost recovery from all users of the line rather than having the 12-mile Minnesota portion of the Arrowhead-Weston Project included only in Minnesota Power's rate base. All materials and equipment for construction of the line are owned by ATC. ATC's operation of the Arrowhead-Weston Project is subject to the MISO OATT. Minnesota Power maintains ownership and control of all of its existing transmission assets and easements (including Minnesota Power's Arrowhead 230/115-kV Substation and HVDC terminal) and made no transfers to ATC as a result of the parties' Agreement.

<sup>4</sup> *In the Matter of Minnesota Power Company's Petition for Review of an Agreement Between Minnesota Power and American Transmission Company*, Docket No. E015/PA-04-2020, INITIAL FILING (Dec. 23, 2004).

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Power to ATC subject to conditions.<sup>5</sup> Minnesota Power's Arrowhead 230 kV/115 kV Substation, where the existing  $\pm 250$  kV HVDC transmission line terminates, is converted to AC, and interconnects to Minnesota Power's 230 kV transmission system to deliver power directly to Minnesota Power's customers, is located adjacent to ATC's Arrowhead 345 kV/230 kV Substation and predates the ATC Arrowhead 345 kV/230 kV Substation by many decades.

For the Minnesota portion of the Arrowhead-Weston Project, the parties determined that Minnesota Power would act as ATC's contractor. This put the responsibility for obtaining the necessary permits and land rights for the line, and managing the design and construction of the line consistent with the requirements of Minnesota Power's transmission system and good utility practice and standards. Subsequent agreements required Commission approval because ATC and Minnesota Power are affiliated interests under Minn. Stat. § 216B.48.<sup>6</sup> In exchange for these agreements, ALLETE, Inc. (through ALLETE Transmission Holdings, Inc. a Wisconsin affiliate of Minnesota Power) owns an eight percent interest in ATC.<sup>7</sup>

### **Response to the Arrowhead Alternative**

ATC recommends that the EA for the project “[s]tudy, evaluate, and adopt the proposed Arrowhead Alternative as a preferred alternative to the Applicant’s proposal to construct the new 345-kV St. Louis County Substation as part of the Project.”<sup>8</sup> According to ATC, the Arrowhead Alternative would involve interconnecting the new HVDC converter station to the alternating-current (“AC”) bulk transmission system by leveraging existing infrastructure, namely, ATC’s own Arrowhead 345/230-kV Substation. In particular, ATC describes the Arrowhead Alternative as follows:

This alternative would essentially involve interconnecting the new HVDC terminal directly to ATC’s existing Arrowhead 345/230-kV Substation through two approximately one-mile 345-kV transmission lines. To minimize impacts, the new 345-kV transmission lines could be constructed in a double-circuit configuration. These lines would re-use a portion of the [right-of-way] currently used for the 250-kV Square Butte transmission line that is located between the new HVDC terminal and ATC’s Arrowhead 345/230 kV Substation, as the Applicant states that this segment of the Square Butte line will be removed/decommissioned as part of the Project.<sup>9</sup>

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<sup>5</sup> *Id.* at ORDER (Dec. 2, 2005).

<sup>6</sup> *In the Matter of Minnesota Power Company’s Petition for Review of an Affiliated Interest Agreement with American Transmission Company*, Docket No. E015/AA-11-75, ORDER (Sept. 6, 2011).

<sup>7</sup> While ALLETE owns a minority position of ATC, ATC did not provide Minnesota Power of any advance notice of its filings in this HVDC Modernization proceeding nor did it consult with Minnesota Power’s planners to share its concerns after initial discussions initiated by Minnesota Power in September 2022 nor did they request any additional information as to Minnesota Power’s proposed Project. There is also no record that ATC consulted with any state agencies or did any other outreach in advance of its comments.

<sup>8</sup> ATC Comments at 8 (eDockets Nos. [20239-198974-02](#) and [20239-198974-01](#)) (Sept. 15, 2023).

<sup>9</sup> ATC Comments at 6.

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While ATC's Arrowhead Alternative may seem to be "simple," ATC has actually proposed an unnecessarily complex system alternative to the proposed HVDC Modernization Project involving both an alternative endpoint and an alternative interconnection voltage. ATC provides four primary reasons in support of the Arrowhead Alternative.<sup>10</sup> First, ATC claims that the Arrowhead Alternative achieves the same purpose as the Applicant's proposal – namely, connecting the Square Butte HVDC line and terminals to the AC bulk electric system at 345 kV. Second, ATC claims that the Arrowhead Substation has sufficient space to interconnect with the HVDC converter station "as well as potential future transmission expansion in the area." Third, ATC claims that the Arrowhead Alternative would have lower environmental impacts compared to the Project. Fourth, ATC claims that the Arrowhead Alternative would be a lower cost alternative compared to the Project. However, contrary to ATC's claims, ATC's Arrowhead Alternative does not actually accomplish any of these purposes and as a result it does not present a reasonable alternative to the Project and should not be evaluated in the EA.

1. The Arrowhead Alternative does not achieve the same purpose as the Project.

Regarding ATC's first claim that the Arrowhead Alternative would "achieve the same purpose as the Applicant's proposal – namely, connecting the Square Butte HVDC line and terminals to the AC bulk electric system at 345 kV," it is apparent that ATC has not fully grasped the scope and purpose of Minnesota Power's HVDC Modernization Project. The fundamental need driver for the HVDC Modernization Project is the age and condition of the existing HVDC Converter Stations located on either end of the transmission line. The orderly and expeditious replacement of this failing HVDC terminal equipment is prudent to ensure continuous efficient delivery and expansion of Minnesota Power's renewable, carbon-free energy resources to its customers. The Project is a critical component of Minnesota Power's efforts to leverage existing infrastructure to efficiently serve its existing load, gain additional access to renewable resources for customers, and keep momentum for reaching the State's goal of 100 percent carbon-free energy by 2040. The Project also innovatively proposes flexible design options to allow for future expansion and additional renewable energy transfer capability, leveraging the unique attributes of modern HVDC technology.

To achieve these purposes, Minnesota Power's primary goal in developing the HVDC Modernization Project is to maintain continuity of the delivery of renewable energy from its existing HVDC transmission line directly to its customers. The simplest and most efficient way to achieve this purpose is by re-connecting the new HVDC converter to the existing points of interconnection for the HVDC line on Minnesota Power's Arrowhead 230 kV bus. In fact, the only reason that moving the point of interconnection from the Minnesota Power Arrowhead 230 kV bus to the ATC Arrowhead 345 kV bus is being discussed at this time is due to Minnesota Power's intentional decision to design the new HVDC converter transformers to operate at 345 kV, where they will provide the most long-term value to Minnesota Power's customers and the region as the regional transmission

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<sup>10</sup> ATC Comments at 7.

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system develops in the future.<sup>11</sup> That decision and the proposed St. Louis County Substation are both part of the “flexible design options” that allow for future expansion without hindering the immediate and primary project purpose and need of replacing failing HVDC terminal equipment. These design options are what has allowed Minnesota Power to apply for federal and state funding opportunities intended to reduce Minnesota Power customer rate impacts of this Project<sup>12</sup> – and use of ATC’s Arrowhead Substation instead of the proposed St. Louis County Substation may disqualify Minnesota Power from using the \$15 million awarded to it by the Minnesota Legislature in 2023 or the Minnesota Power application for the Minnesota State Competitiveness Grant that could award an additional \$15 million grant for the Project to support Minnesota Power’s pending \$50 million DOE grant application for the Project.<sup>13</sup>

Contrary to ATC’s claims, moving the point of interconnection from the Minnesota Power Arrowhead 230 kV bus to the ATC Arrowhead 345 kV bus would not achieve the same purpose as the proposed Project and would, in fact, undermine the purpose and need for the HVDC Modernization Project by substantively changing the electrical configuration of the transmission system in ways not adequately addressed by ATC in its discussion of the Arrowhead Alternative. These changes would add unnecessary complexity and risk that is unacceptable for the HVDC Modernization Project, particularly given the urgency of the need to address the age and condition of the existing HVDC terminal equipment. To illustrate these complexities, it is necessary to understand the basic configuration of the Arrowhead 345 kV/230 kV Substation.

To facilitate the interconnection of the Arrowhead-Weston Project 345 kV line to the Minnesota Power 230 kV system when the Arrowhead-Weston Project was constructed, it was necessary to add a 345 kV/230 kV transformer to step up the voltage at the Arrowhead Substation. However, due to a lack of other strong connections between northern Minnesota and northwest Wisconsin, it was also necessary to install equipment at the Arrowhead 345 kV/230 kV Substation capable of limiting the power flow on the 345 kV line to prevent adverse reliability impacts under certain regional transfer conditions. Therefore, the Arrowhead-Weston 345 kV line is interconnected at the Arrowhead Substation via a single 345 kV/230 kV transformer with a continuous rating of 800 MVA and a 230 kV phase shifting transformer (the “Arrowhead PST”) that is operated in series with the 345 kV/230 kV transformer. The Arrowhead PST serves the purpose of controlling power flow as needed to address phase angle differences between the weakly-connected systems in

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<sup>11</sup> See Application at Section 4.3.2. The converter transformers make up 20 percent of the cost of the HVDC Converter Station and, therefore, the initial design should consider their use and operation over the 40-50 years they are expected to be in use.

<sup>12</sup> Application at Section 2.2.5.

<sup>13</sup> 2023 Minn. Laws Chapter 60, Article 10, Sec. 2, Sub. 2(h). “\$15,000,000 the first year is for a grant to an investor-owned electric utility that has at least 50,000 retail electric customers, but no more than 200,000 retail electric customers, to increase the capacity and improve the reliability of an existing high-voltage direct current transmission line that runs between North Dakota and Minnesota. This is a onetime appropriation and must be used to support the cost-share component of a federal grant application to a program enacted in the federal Infrastructure Investment and Jobs Act, Public Law 117-58, and may otherwise be used to reduce the cost of the high-voltage direct current transmission project upgrade and to reimburse the reasonable costs incurred by the department to administer the grant. This appropriation is available until June 30, 2034.”

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northern Minnesota and northwest Wisconsin. It is common to refer to a “Minnesota side” of the Arrowhead PST, generally corresponding to Minnesota Power’s Arrowhead 230 kV Substation, and a “Wisconsin side” of the Arrowhead PST, generally corresponding to ATC’s Arrowhead 345-kV Substation. There are presently no other 345 kV transmission connections at the ATC Arrowhead Substation and therefore **it is physically impossible for more than 800 MVA to flow on the Arrowhead-Weston 345 kV line without overloading both of these large transformers at ATC’s Arrowhead Substation.**<sup>14</sup> In fact, if system conditions were present that might lead to such overloads, the Arrowhead PST would be utilized by system operators to limit power flow through the Arrowhead 345 kV/230 kV Substation to avoid transformer overloads and other adverse system impacts. This was an intentional system design feature implemented by ATC and Minnesota Power with the original Arrowhead-Weston Project.

ATC’s proposed Arrowhead Alternative would move the point of interconnection for Minnesota Power’s HVDC line from the Minnesota side of the Arrowhead PST (Minnesota Power’s 230 kV bus) to the Wisconsin side of the Arrowhead PST (ATC’s 345 kV bus). The change in system power flows resulting from the additional HVDC line injection on the Wisconsin side of the Arrowhead PST caused by the Arrowhead Alternative, along with other attributes of the Arrowhead Alternative as proposed by ATC, would require additional studies, power system modifications, regulatory considerations, and construction impacts that introduce tremendous additional complexity and risk for the Project:

- First, a second 345 kV/230 kV transformer would need to be installed in the ATC Arrowhead 345-kV Substation to accommodate increased power flows from the 345 kV system into the 230 kV system under certain system conditions and contingencies. ATC agrees with this and shows this second transformer as part of its Arrowhead Switchyard Expansion drawing included with its September 15, 2023 comments. In Minnesota Power’s experience, transformer costs and lead times have more than doubled in recent years, particularly for transformers of the scope and scale necessary for the Project or the Arrowhead Alternative. These transformers now make up the majority of the cost when establishing a new substation or modifying an existing substation, and their delivery times (in excess of three to four years) have become the critical path for project execution schedules in many instances. While Minnesota Power is nearing completion of a process to procure production slots for new 345 kV/230 kV transformers to support the HVDC Modernization Project, the necessary transformers for ATC’s Arrowhead Alternative would presumably be procured by ATC at a later date – likely introducing significant delays in the project implementation schedule that are outside of Minnesota Power’s direct control.
- Second, regional planning and integration studies would need to be conducted to determine if the power flow control functionality of the Arrowhead PST is still necessary after relocating the point of interconnection for the HVDC line, or if the

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<sup>14</sup> *In the Matter of the 2021 Minn. Biennial Transmission Projects Report*, Docket No. E999/M-21-111, REPLY COMMENTS OF THE MTO at 4-5 (Feb. 25, 2022).

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Arrowhead PST may be bypassed. Given the historical complexities of the interface between northern Minnesota and northwestern Wisconsin, it is not altogether clear that the relocation of the HVDC line point of interconnection as part of the Arrowhead Alternative would, by itself, allow for the Arrowhead PST to be bypassed. If there is a need for continued power flow control capability on the Minnesota/Wisconsin interface, then a second 230 kV phase shifting transformer would need to be installed in series with the second 345 kV/230 kV transformer identified above. ATC appears to assume in its proposal that the Arrowhead PST will no longer be needed and therefore does not appear to include a second PST with the second transformer, either in its switchyard expansion layout or its cost estimate. However, such a determination can only legitimately be made after rigorous, comprehensive, and coordinated regional studies have taken place to demonstrate that the system can continue to operate reliably in this configuration without the Arrowhead PST. Minnesota Power is not aware that such studies have taken place. If it was determined at a later date that a second Arrowhead PST is needed, then the transformer would presumably be procured by ATC at that later date. Because phase shifting transformers are less common and more technically complex in their design, the cost and production lead time for these transformers are significantly higher. Minnesota Power recently received feedback from a transformer manufacturer for a different project that its phase shifting transformer production slots were filled through the end of 2028, meaning the earliest possible delivery date for a phase shifting transformer to support the Arrowhead Alternative to the HVDC Modernization Project is likely first quarter 2029 or later. The need for a new phase shifting transformer would introduce significant uncertainty and practically guarantee schedule delays in developing the AC interconnection facilities necessary to reconnect the new HVDC converters to the AC transmission system. Maintaining the existing point of interconnection for the HVDC line to the Minnesota Power Arrowhead 230 kV bus addresses the need to replace the HVDC converters while avoiding this issue entirely.

- Third, the relocation of the HVDC line point of interconnection to the Wisconsin side of the Arrowhead PST would cause power flow through the Arrowhead 345 kV/230 kV Substation and on the Arrowhead-Weston 345 kV line to exceed the MN EQB 800 MVA limit established when the Arrowhead-Weston Project was originally permitted. This would require the Commission to consider the modification of the 800 MVA limit and potentially bring additional parties and complexities to the regulatory process. However, the purpose of the HVDC Modernization project is not to send more power into Wisconsin, but rather to continue reliably delivering the energy generated by Minnesota Power's existing renewable resources to its customers in northern Minnesota. Maintaining the existing point of interconnection for the HVDC line to the Minnesota Power Arrowhead 230 kV bus addresses the need to replace the HVDC converters while avoiding this issue entirely.
- Fourth, a new transmission-to-transmission ("T-T") interconnection would need to be established between ATC and Minnesota Power. The new T-T agreement would need to address, among other things, how the power delivered from Minnesota

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Power's renewable energy resources via the HVDC transmission line would flow through the ATC Arrowhead 345 kV/230 kV Substation to the Minnesota Power Arrowhead 230 kV Substation to be delivered to Minnesota Power's customers. Maintaining the existing point of interconnection for the HVDC line to the Minnesota Power Arrowhead 230 kV bus addresses the need to replace the HVDC converters while avoiding this issue entirely. This arrangement would also introduce additional cost to the Project as Minnesota Power would then need to compensate ATC for the use of ATC transmission facilities to meet Minnesota Power customer needs.

- Fifth, the Arrowhead Alternative would require extensive outages of the existing HVDC line to construct this alternative. After years of analysis of system interconnection options and constructability, Minnesota Power concluded that the most practical, reliable, efficient and economical way to serve its customers, is to construct the new HVDC Converter Station and associated AC interconnection facilities on sites adjacent to the existing HVDC line and converter station. Not only will the Project configuration allow for re-connection of the replacement HVDC Converter Station to its existing point of interconnection at the Minnesota Power Arrowhead 230 kV bus, the configuration proposed by Minnesota Power will ensure that the *existing* HVDC transmission system can remain energized during construction of the replacement system. This planning and energization is significant in that it minimizes disruptions for Minnesota Power customers from any outages of the existing HVDC transmission system necessary to construct the HVDC Modernization Project. Constructability was a key consideration in Minnesota Power's project planning.<sup>15</sup> In proposing to replace the existing HVDC transmission line with a new double-circuit 345-kV line to interconnect to the ATC Arrowhead 345-kV Substation, ATC's Arrowhead Alternative would increase construction outage duration significantly – potentially by several months as the existing HVDC line would need to be de-energized and removed before construction of the new 345-kV line could begin. As discussed throughout the Application, HVDC outages come with a potentially significant cost for replacement power to Minnesota Power customers, as the economical wind generation would not be available for delivery and Minnesota Power would need to purchase replacement power and potentially curtail wind production. Unlike ATC's Arrowhead Alternative, Minnesota Power's proposed Project has been designed to minimize the impact of these outages to the greatest reasonable extent.

Minnesota Power's proposed configuration for the HVDC Modernization Project does not raise any of these issues, because it maintains the point of interconnection for the HVDC line at its present location on the Minnesota Power 230 kV bus and is designed to minimize outage and construction impacts. In Minnesota Power's analysis of alternatives, the proposed Project configuration was determined to best accomplish the purpose and need for the Project to maintain continuity of the HVDC transmission line and the delivery of renewable energy resources to Minnesota Power's customers. For a project largely focused on replacement of aging HVDC system assets to maintain and improve upon

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<sup>15</sup> Application at Section 3.4.2.

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reliability where reasonable, there is no need to implement the disruptive system reconfigurations and associated additional complexities and risks presented by ATC's proposed Arrowhead Alternative. Indeed, given these complexities, it is unclear how well-developed the concept of the Arrowhead Alternative truly is relative to the proposed Project, or what ATC's purpose and interest is in proposing the Arrowhead Alternative. Minnesota Power's proposal does not require any change in or evaluation of the operation of the Arrowhead PST, **does not require any consideration or modification of the MN EQB 800 MVA limit**, does not establish any new points of interconnection between ATC and MP, and does not raise significant constructability issues from long-duration HVDC line outages required to implement the Arrowhead Alternative. Minnesota Power's proposed Project configuration is clearly the most efficient solution for the stated purpose of the HVDC Modernization Project, which is why Minnesota Power proposed the Project as it is configured after considering and rejecting the Arrowhead Alternative following discussions with ATC in Fall 2022.

2. The Arrowhead Alternative provides no additional benefits for future expansion.

Regarding ATC's second claim that the Arrowhead Substation would have "more than sufficient space within ATC's Arrowhead 345 kV/230 kV Substation" to interconnect with the HVDC converter station "as well as potential future transmission expansion in the area", these claims do not make the Arrowhead Alternative superior to the proposed Project. Simply having enough space inside the Arrowhead Substation to accommodate the interconnection facilities proposed by ATC as part of the Arrowhead Alternative does not mitigate the fact that the Arrowhead Alternative is a fundamentally different project configuration that introduces the additional and unnecessary complexities and risks described above. When all factors are considered in the context of the purpose and need for the Project, including particularly the potential schedule delays introduced by the additional complexities of the Arrowhead Alternative and the cost of those delays,<sup>16</sup> it is clear that the availability of space in the Arrowhead Substation is not sufficient justification by itself to propose unnecessary and significant changes to the regional power system that may be avoided with the proposed Project configuration.

Furthermore, speculative future transmission expansion that could be accommodated by the Arrowhead Alternative is not within the scope of the Project and Minnesota Power is not proposing any specific transmission expansion plans like those contemplated by ATC. Minnesota Power has gone to great lengths to propose a design for the Project that addresses the urgent need to replace the existing aging HVDC terminals while thoughtfully maintaining flexibility for the future. However prudent they are, these design options to accommodate future expansion should not overshadow the fundamental Project purpose and need to maintain reliable delivery of Minnesota Power's renewable energy resources over Minnesota Power's existing HVDC transmission line to Minnesota Power's customers.<sup>17</sup> The Arrowhead Alternative proposed by ATC appears to place more

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<sup>16</sup> Application at Section 3.8.

<sup>17</sup> Application at Section 2.1.2.4.



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emphasis on future expandability at the expense of introducing significant additional complexity, delay, and cost for Minnesota Power's HVDC Modernization Project.

As noted in the Application, regional planning efforts like the MISO Long Range Transmission Plan ("LRTP") are underway to identify the transmission needed to support the clean energy transition.<sup>18</sup> These regional planning efforts have little to do with Minnesota Power's immediate need for the HVDC Modernization Project and have only impacted the Project insofar as the fact that they are ongoing has factored into Minnesota Power's consideration of long-term needs and flexibility designed into the Project, seeking where possible to ensure that Minnesota Power's plans are not inconsistent with MISO's potential long-term plans. Minnesota Power has no plans to make the transmission line capacity increases identified by ATC in its proposal for the Arrowhead Alternative.<sup>19</sup> To the extent ATC has plans to expand its Arrowhead Substation and develop interconnections to the south and east, those expansion plans are not within the scope of the Project and should first be analyzed, justified, and recommended by MISO in its LRTP or similar planning efforts, provided those plans achieve the best value for meeting regional transmission system needs identified by MISO. If approved by the MISO Board of Directors, any such projects would then subsequently need to be evaluated (to the extent proposed) as part of separate certificate of need and route permit proceedings, as appropriate, in consideration of their own justification and impacts. Minnesota Power also notes that any such expansion of the Arrowhead Substation, if proposed by ATC for any project and considered separate and apart from the HVDC Modernization Project, would likely exceed the 800 MVA Limit and therefore require evaluation of the limitations placed on ATC's Arrowhead Substation by the EQB in 2001.<sup>20</sup> The Arrowhead Alternative, as proposed by ATC, would pre-emptively and inappropriately bring issues into consideration as part of Minnesota Power's HVDC Modernization Project that should rightly be dealt with through MISO's regional transmission planning process and future project-specific regulatory filings. In raising these issues for the HVDC Modernization Project, ATC's Arrowhead Alternative would transfer cost and responsibility onto Minnesota Power's customers for making significant changes to the regional transmission system (building 345-kV lines into Arrowhead and bypassing the Arrowhead PST) rather than leaving those changes to be dealt with through the MISO LRTP process, where they would be governed by the Multi-Value Project ("MVP") provisions in the MISO Tariff and, if they meet the relevant criteria from the Tariff, eligible for regional cost allocation. Contrary to ATC's proposal, Minnesota Power's proposed Project aligns cost and causation<sup>21</sup> with the Project's purpose of maintaining continuous and reliable operation of the HVDC terminals for Minnesota Power's customers.

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<sup>18</sup> Application at Section 3.3.3.

<sup>19</sup> ATC Comments at 13 (expansion of the Arrowhead Substation to the east labeled "switchyard expansion" as well as "Future 345 kV lines" and "651 Reroute").

<sup>20</sup> MEQB Docket No. MP-HVTL-EA-1-99 (Mar. 19, 2001).

<sup>21</sup> ATC's proposal also risks certain cost mitigation strategies as discussed above.

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3. The Arrowhead Alternative is not less environmentally impactful than the Project.

ATC also claims, based on a desktop only analysis, that its Arrowhead Alternative would reduce the environmental impacts of the proposed Project. However, this assertion ignores the fact that ATC's Arrowhead Alternative would require three crossings of the West Rocky Run stream, one at the existing  $\pm 250$  kV HVDC line crossing location and two additional new crossings (one north-south crossing and one east-west crossing) of that stream. In comparison, the proposed Project would require only one crossing location of the West Rocky Run stream (at the location of the existing  $\pm 250$  kV HVDC line) but would expand the right-of-way to accommodate two 230 kV lines, rather than the existing  $\pm 250$  kV HVDC line.<sup>22</sup>

ATC's claim that the Arrowhead Alternative has fewer environmental impacts also ignores the environmental impacts of possible future expansion of the Arrowhead Substation, even though future expansion appears to be a major consideration in ATC's development of the Arrowhead Alternative. When ATC's Arrowhead Substation was constructed, Minnesota Power developed 2.6 acres of wetland mitigation immediately adjacent (east) to the substation. These wetlands are shown in **Attachment 2** and are located beyond the concrete-walled perimeter<sup>23</sup> of ATC's Arrowhead Substation. ATC's future expansion of its Arrowhead Alternative would require filling approximately 1.2 acres of mitigated wetland. The expansion of ATC's Arrowhead Substation into the existing wetland mitigation area also contemplates the relocation of six existing transmission lines, including ATC's own 345 kV line and five Minnesota Power 115 kV lines. In its discussion of future considerations for the Arrowhead Alternative, ATC does not address how or where these lines would be relocated to make space for the conceptual eastward expansion of the ATC Arrowhead Substation, or what the environmental impacts of the required relocations would be. The HVDC Modernization Project, as proposed, would not impact the existing wetland mitigation banks and would not require existing transmission lines to be relocated to accommodate future expansion. In fact, the design options for future expansion provided by the St. Louis County Substation, in combination with existing space for expansion inside the ATC Arrowhead 345 kV/230 kV Substation, would help to minimize or avoid these future environmental impacts, in the event that future projects required additional 345 kV connections in the area.

4. The Arrowhead Alternative is not a less costly alternative for the HVDC Modernization Project.

Finally, ATC claims that the Arrowhead Alternative is a lower cost solution than Minnesota Power's proposed Project configuration. As support for this claim, ATC cites its own cost estimate of \$34 million (in 2022 dollars) for the Arrowhead Alternative in comparison with Minnesota Power's estimate of \$40-\$70 million (in 2022 dollars) for the Minnesota Interconnection Facilities of the proposed Project. In providing an estimate for

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<sup>22</sup> The  $\pm 250$  kV HVDC line would be removed from this location and replaced with two 230 kV transmission lines.

<sup>23</sup> ATC elected to construct a concrete perimeter around its substation instead of a standard chain-linked fence.

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its alternative concept, ATC does not provide a range or specify assumptions that would allow for the cost estimate to be compared with Minnesota Power's estimate, so it is difficult to determine if the ATC cost estimate represents a true apples-to-apples comparison with Minnesota Power's cost estimates.

As is evident from Minnesota Power's thorough consideration of the Arrowhead Alternative in these comments, there are significant areas where the development of the Arrowhead Alternative as a concept is incomplete. For example, ATC does not specify whether its cost estimate includes an additional 345 kV/230 kV transformer at the ATC Arrowhead Substation or an additional 230 kV phase shifting transformer at ATC's Arrowhead Substation that could be necessary to maintain the stability of the transmission system if the Arrowhead Alternative were implemented. In Minnesota Power's experience, these transformers alone could increase ATC's cost estimate by 150-200 percent, placing it solidly in the mid to high end of the corresponding range for Minnesota Power's proposed Project configuration.

Furthermore, ATC's cost estimate does not take into account potentially substantial impacts from project delays and construction outages introduced by the Arrowhead Alternative. As discussed above in these comments, schedule delays and HVDC outages have significant cost impacts to Minnesota Power's customers which are obviously not being taken into consideration by ATC. At best, the Arrowhead Alternative appears to be similar in cost to Minnesota Power's proposed Project configuration. Depending on how ATC developed its estimate and the findings of regional transmission planning studies necessary to evaluate the system reconfigurations caused by the Arrowhead Alternative, the direct cost for the Arrowhead Alternative may actually be greater than Minnesota Power's proposed Project configuration. Considering costs holistically, including direct costs, cost impacts from delays and construction outages, as well as potential loss of state and federal grant money associated with Minnesota Power's proposed Project design, the Arrowhead Alternative proposed by ATC is almost certainly a higher-cost alternative.

5. The Arrowhead Alternative should not be evaluated in the EA.

The ATC Arrowhead Alternative is unnecessarily complex and would require not only a different endpoint for the Project but also an alternative interconnection voltage. As detailed above, ATC's Arrowhead Alternative does not serve the need of the HVDC Modernization Project, and would require additional studies, power system modifications, regulatory considerations, and construction impacts that introduce tremendous additional complexity and risk for the Project. The ATC Arrowhead Alternative inappropriately brings issues into consideration as part of the HVDC Modernization Project that should rightly be dealt with through MISO's regional transmission planning process and future project-specific regulatory filings, is inferior to the HVDC Modernization Project for future expansion possibilities, would lead to more significant environmental impacts than the HVDC Modernization Project, and would be more costly than the HVDC Modernization Project for Minnesota Power and its customers. For these reasons, the Arrowhead Alternative should not be evaluated in the EA.

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### **Response to MnDNR Comments**

The MnDNR commented that both the Proposed Route and the Arrowhead Alternative will require “two new crossings of West Rocky Run.” The HVDC Modernization Project proposes to create a crossing of the stream using two parallel 230 kV transmission lines that would replace the current  $\pm 250$  kV HVDC line crossing. This crossing would occur adjacent to the existing  $\pm 250$  kV HVDC line, albeit on a wider right-of-way. Maintaining two parallel 230 kV transmission lines is important because the interconnection point for each line is located at two separate and distinct locations within Minnesota Power’s Arrowhead Substation yard and the construction of the two transmission lines on separate structures maintains the redundancy and electrical integrity of having two independent connections to the HVDC converter station. ATC’s Arrowhead Alternative is inferior to the Proposed Route with respect to the stream crossings for the reasons discussed above. Minnesota Power recognizes the attributes of this stream, as the MnDNR has explained, and is willing to work with the MnDNR on practicable mitigation measures for Minnesota Power’s proposed crossing so long as electrical safety and reliability are maintained. Additionally, Minnesota Power will work with the MnDNR on the removal of the existing  $\pm 250$  kV transmission line components that cross West Rocky Run.

The MnDNR also provided comments on a public waters work permit, water appropriation, mineral resources, natural heritage review, facility lighting, dust control, and wildlife-friendly erosion control. With respect to these comments, Minnesota Power can make the following commitments for the HVDC Modernization Project and requests that the EA include these commitments in its analysis:

- **Public Waters Work Permit:** The need for a public waters work permit is not anticipated. However, in the event that one is required, Minnesota Power will work with the MnDNR to obtain one for the Project.
- **Mineral Resources and Geophysical Surveys:** Such a request for a mineral survey would increase Project costs. Further, the property proposed to be used for the Project is not state or federal lands. Minnesota Power will share its geotechnical reports with the MnDNR when those surveys are performed.
- **Natural Heritage Review:** Regarding the northern goshawk, Minnesota Power will schedule the Project’s tree clearing activities to occur during the northern goshawk’s inactive season.
- **Facility Lighting:** Minnesota Power will install shielded/downward facing lighting to minimize wildlife impacts due to facility lighting.
- **Dust Control:** Dust mitigation/control measures during Project construction will not include products that contain chloride.

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- Wildlife-Friendly Erosion Control: Minnesota Power will use wildlife-friendly erosion control measures during construction and will not use plastic mesh netting when installing erosion control best management practices.


The MnDNR also expressed concern that Minnesota Power “has not engaged [MnDNR] staff in early coordination on” the HVDC Modernization Project. Minnesota Power would like to provide additional context and clarity in response to MnDNRs concern. Minnesota Power regularly works with various local, state, and federal agencies during its project and route development processes and did the same for the HVDC Modernization Project.

The MnDNR is comprised of many different divisions and Minnesota Power works to engage each resource division at certain points along the way when a transmission project is being developed. As demonstrated in the Application for the HVDC Modernization Project, Minnesota Power sought input from the MnDNR at several times, including from MnDNR Lands and Minerals,<sup>24</sup> MnDNR Parks and Trails,<sup>25</sup> MnDNR Endangered Resources,<sup>26</sup> and DNR Regional Assessment Ecologist.<sup>27</sup> The MnDNR provided responses and information to Minnesota Power via MnDNR Endangered Resources<sup>28</sup> and MnDNR Land and Minerals included as **Attachment 3**. Additionally, MnDNR representatives are listed on the Commission’s PPSA Notice List for all formal Project filings, and were provided copies of necessary notices, including the HVDC Modernization Project Notice of Filing Letter dated June 9, 2023, and all previous and subsequent Project filings made with the Commission. Minnesota Power is not sure why this information was not communicated within the MnDNR or to Ms. Warzecha ahead of her September 22, 2023 letter.

### Conclusion

Minnesota Power appreciates the opportunity to provide these response comments addressing ATC’s Arrowhead Alternative and the MnDNR Comments. Based on the analysis provided above, ATC’s Arrowhead Alternative should not be considered in the EA. Minnesota Power also requests that its commitments in response to the MnDNR Comments be included in the EA. If you have any questions regarding this filing, please contact me at (218) 723-3963 or [dmoeller@allete.com](mailto:dmoeller@allete.com).

Sincerely,



David R. Moeller  
Senior Regulatory Counsel

cc: Service Lists

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<sup>24</sup> Application at Appendix J at 38.

<sup>25</sup> Application at Appendix J at 42.

<sup>26</sup> Application at Appendix J at 58.

<sup>27</sup> Application at Appendix J at 119.

<sup>28</sup> Application at Appendix J at 82.

STATE OF MINNESOTA  
ENVIRONMENTAL QUALITY BOARD

In the Matter of the Exemption  
Application by Minnesota Power for a  
345/230 kV High Voltage Transmission  
Line Known as the Arrowhead Project

**MINNESOTA ENVIRONMENTAL  
QUALITY BOARD'S FINDINGS OF  
FACT, CONCLUSIONS, AND  
ORDER GRANTING EXEMPTION**

**MEQB DOCKET NO.  
MP-HVTL-EA-1-99**

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The above-entitled matter came before the Minnesota Environmental Quality Board at a regular meeting on March 15, 2001, pursuant to an application by Minnesota Power for an Exemption from the Power Plant Siting Act for a High Voltage Transmission Line known as the Arrowhead Project.

**STATEMENT OF ISSUE**

Should Minnesota Power be granted an Exemption from the Power Plant Siting Act for a 345/230 kV High Voltage Transmission Line to be constructed in St. Louis County, Minnesota

Based upon all of the proceedings herein, the Minnesota Environmental Quality Board makes the following:

**FINDINGS OF FACT**

1. The Findings of Fact of the Administrative Law Judge in his report dated January 29, 2001, are adopted with the following amendments.
2. The second bullet of Finding No. 11 is amended to read and a new footnote 18A is added to read:

Adding four single-phase 345/230 kilovolt transformers to interface with the 345 kV line. These transformers step up the voltage from 230 kV to 345 kV. The approximate rating of these transformers is 800 MVA. [18A]

18A. Transcript at 1874.

3. The first sentence of Finding No. 15 is amended as follows, footnote 26 is amended as follows, and the remaining language is unchanged:

15. In all the segments, the 345 kV circuit will consist of two-wire bundled 1272 kcmil ACSR conductor for each of the three phases segments for a total of six.  
~~twelve.~~

[26] MEQB EX. 1, at 10. 2.

4. Finding No. 37 is amended to read:

37. MP will notify the DM&IR railroad when ~~installation-construction~~ of the 345 kV HVTL and 115 kV power line will be affecting the railroad's trackage. Similar notification to the Minnesota Department of Transportation will occur when the construction crosses Interstate 35. MP will schedule its construction activities to minimize the ~~affect-effect~~ on vehicular traffic.[88] There are no impacts on public services arising out of the Arrowhead Project.

5. Finding No. 38 and footnotes 91 and 92 are amended to read:

38. Electric and magnetic fields (EMF) arise from the flow of electricity and the voltage of a line. 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 through the conductors.[89] There are no state or federal standards for transmission line electric fields or magnetic fields.

38A. Electric fields are measured in units called kilovolts per meter (kV/meter). The MEQB has included permit conditions for other transmission lines specifying that maximum electric fields must not exceed 8 kV/meter.[90] The maximum anticipated electric field exposure for the MP transmission line, measured directly under the HVTL, is approximately 6.1 6.5 kV/meter.[91] ~~Within~~ At a distance of 100 feet of the centerline of the HVTL, the electric field strength nears zero. [92]

[91] MEQB Exhibit 17 at 4.; ~~DLV -1, Sheets 1-6.~~

[92] Id. at DLV -1, Sheets 1-6.

6. Finding No. 39 and footnote 94 are amended to read:

39. ~~EMF is also~~ Magnetic fields are measured in milligauss (mG). Common electrical appliances produce ~~EMF-magnetic~~ fields while in operation, as do HVTLs. The Arrowhead Project will increase ~~EMF~~ exposures to magnetic fields for persons living along the right of way above current ~~EMF~~ levels.[93] The amount of the increase is ~~small~~,

~~ranging~~ ranges from approximately 50 mG at the edge of the right of way to approximately 10 mG at the distance of the nearest home to the Arrowhead HVTL, which is approximately 160 feet.[94] These increased levels occur at the periods of peak flow and are present approximately 5% of the time.[95]

[94] By way of comparison, an electric stove emits an ~~EMF~~ a magnetic field of 21.6 mG at a distance of one foot. A person making a photocopy is exposed to an ~~EMF~~ a magnetic field of 31 mG. MP-17; DLV-6. The 160 feet figure for the distance to the nearest home is found at Tr. at 314.

7. Finding 48 is amended to change the last sentence to read:

The expansion of the existing right of way for that segment has no significant human or environmental impact.

8. Finding No. 49 is amended to read:

49. The other alteration to the right of way for the Arrowhead Project moves the 0.8 miles of the existing route to the eastern side of the DM&IR rail yard. The change is proposed at the request of the landowners along the existing route. ~~the DM&IR railroad.~~ The movement of the 0.8 mile length of right of way does not result in significant human or environmental impact. Removing the existing 0.8 mile segment of 115 kV power line from its existing location is a benefit to persons living in the eastern portion of Gary. The Arrowhead Project uses existing rights-of-way to minimize the impact of upgrading the existing 115 kV power line to a 345 kV HVTL.

9. Finding 54 is amended to read:

54. The Arrowhead Project will not result in a significant impact on human health or the environment in Minnesota from the construction and operation of the proposed transmission line. ~~impose demands on air or water resources~~



Based on the foregoing Findings of Fact, the Minnesota Environmental Quality Board makes the following:

### CONCLUSIONS

1. Any of the foregoing Findings more properly designated as Conclusions are hereby adopted as such.
2. The Minnesota Environmental Quality Board has jurisdiction over the subject matter of the hearing pursuant to Minn. Stat. § 116C.57.
3. All relevant substantive and procedural requirements of law and rule have been fulfilled in order to grant an application for exemption from the Power Plant Siting Act.
4. The proposed project, when constructed in accordance with the attached conditions, "will not create significant human or environmental impact" in any of the categories of impact examined under the terms of Minn. Rule 4400.1310.
5. The Applicant has demonstrated that the Arrowhead Project meets the standards for exemption from the Minnesota Power Plant Siting Act process in Minn. Stat. § 116C.57, subd. 5.

Based upon the foregoing Conclusions, the Minnesota Environmental Quality Board makes the following:

### ORDER

The Minnesota Environmental Quality Board hereby grants an Exemption to Minnesota Power Company from the requirements of the Minnesota Power Plant Siting Act (Minn. Stat. Sections 116C.51 - .69) for the Arrowhead Project, consisting of construction of a 12 mile long 345 kV/115 kV and 345/230 kV High Voltage Transmission Line (for one segment operated at 115 kV) from the Arrowhead substation to the Wisconsin border, and a corresponding modification of the Arrowhead substation, subject to the following conditions:

1. Minnesota Power shall follow the existing right-of-way now occupied by Lines 22, 131, and 132, except for 0.8 miles of new right-of-way along the DM&IR rail yard and except for additional right-of-way width as described in the application.
2. Minnesota Power shall install the low-noise transformers identified in the application at the Arrowhead substation.
3. Minnesota Power shall limit clearing along the right-of-way to vegetation actually affecting the safe operation of the transmission line. The only new right-of-way clearing shall be the 0.8 mile segment along the rail yard and a 3.2 mile segment along

the Midway segment. No herbicides shall be used for clearance if the landowner objects to use of such methods.

4. Minnesota Power shall remove all construction debris from the right-of-way as soon as construction is completed. Minnesota Power shall implement reasonable measures to provide revegetation of low-growing plants along construction areas.

5. Minnesota Power shall implement measures to minimize erosion and to prevent silt from entering surface waters during construction by installing barriers and using set back zones as necessary. The company shall maintain existing trees along streams to be crossed by the line to prevent changes in water temperature.

6. Minnesota Power shall perform no instream work in the four trout streams to be crossed by the line during the time September 15 to April 30.

7. Minnesota Power shall avoid impacts to any wetlands to be crossed by the line by constructing structures in such areas during the winter months when the wetland areas are frozen. If construction or maintenance must be performed in such areas when the wetland is not frozen, Minnesota Power shall use mats to prevent damage.

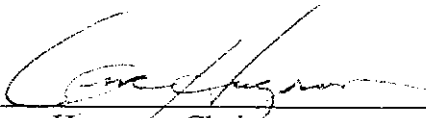
8. Minnesota Power shall consult with landowners whose property is to be crossed by the line regarding placement of structures to minimize interference with agricultural operations.

9. Minnesota Power shall obtain all necessary permits from federal and state and local units of government before proceeding with construction.

10. Minnesota Power shall apply to the Minnesota Environmental Quality Board under section 116C.57 for authorization to make any changes in the Arrowhead substation that would allow Minnesota Power to increase the capability of the substation to transmit power over the transmission line beyond 800 MVA.

STATE OF MINNESOTA  
ENVIRONMENTAL QUALITY BOARD

Dated: 3/15/01

  
Gene Hugoson, Chair

OAH 5-2500-39600  
PUC: E-015/CN-22-607  
PUC: E-015/TL-22-611

**STATE OF MINNESOTA  
OFFICE OF ADMINISTRATIVE HEARINGS  
FOR THE  
PUBLIC UTILITIES COMMISSION**

In the Matter of the Application of  
Minnesota Power for a Certificate of Need for  
the HVDC Modernization Project in  
Hermantown, Saint Louis County;

In the Matter of the Application of  
Minnesota Power for a Route Permit for a  
High Voltage Transmission Line for the  
HVDC Modernization Project in  
Hermantown, Saint Louis County.

I, Carol A. Overland, hereby certify that I have this day served a true and correct copy of the attached W.O.L.F. Motion for Reconsideration of Denial of W.O.L.F.'s Petition to Intervene to all persons on the attached Public Utilities Commission service list via eFiling and eService.



January 22, 2024

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