

Before the Minnesota Public Utilities Commission

State of Minnesota

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

OAH Docket No. 5-2500-39600
MPUC Docket Nos. E015/CN-22-607
and E015/TL-22-611

PROJECT SITING AND ROUTING

March 11, 2024

TABLE OF CONTENTS

	Page
I. INTRODUCTION	1
II. COMPARISON OF POTENTIAL ENVIRONMENT IMPACTS OF THE PROJECT AND THE ATC ARROWHEAD ALTERNATIVE.....	2
A. Environmental Assessment	2
B. Response to ATC Direct Testimony	7
III. UPDATES AND CLARIFICATIONS FROM DIRECT TESTIMONY	10
A. Noise Study	10
B. Corrections to Direct Testimony	11
IV. CONCLUSION	11

1 **I. INTRODUCTION**

2 **Q. Please state your name and business address.**

3 A. My name is Daniel McCourtney, and my business address is 30 West Superior Street,
4 Duluth, Minnesota 55802.
5

6 **Q. Have you previously provided testimony in this proceeding?**

7 A. Yes. I presented Direct Testimony in this proceeding on behalf of ALLETE, Inc., doing
8 business as Minnesota Power (or the “Company”) regarding routing and siting issues
9 related to the HVDC Modernization Project (“Project”).
10

11 **Q. What is the purpose of your Rebuttal Testimony?**

12 A. In this Rebuttal Testimony, I address impacts of the Project compared to the alternative
13 proposed by American Transmission Company LLC, by and through its corporate
14 manager ATC Management Inc. (together “ATC”), which I refer to as the “ATC
15 Arrowhead Alternative” as discussed in the Environmental Assessment (“EA”). I am
16 also responding to Direct Testimony submitted by ATC regarding potential impacts to
17 the natural and socioeconomic environments from Minnesota Power’s proposed Project
18 as compared to the ATC Arrowhead Alternative. Finally, I provide updates and
19 clarifications from my Direct Testimony.
20

21 **Q. Are you sponsoring any exhibits in connection with your Rebuttal Testimony in**
22 **this proceeding?**

23 A. Yes. I am sponsoring the following exhibits:

- 24 • MP Exhibit ____ (Mccourtney), Rebuttal Schedule 1 – Revised EA Map 5 – Land
25 Cover;
- 26 • MP Exhibit ____ (Mccourtney), Rebuttal Schedule 2 – Revised EA Map 6 –
27 Zoning;
- 28 • MP Exhibit ____ (Mccourtney), Rebuttal Schedule 3 – Revised EA Map 8 –
29 Topography;

- MP Exhibit ____ (McCourtney), Rebuttal Schedule 4 – Noise Study for Minnesota Power’s proposed HVDC Modernization Project; and
- MP Exhibit ____ (McCourtney), Rebuttal Schedule 5 – Revised Version of Direct Schedule 1 – Minnesota Power Route Analysis of the Minnesota Power Proposed Configuration for the HVDC Modernization Project and the ATC Arrowhead Alternative.

II. COMPARISON OF POTENTIAL ENVIRONMENT IMPACTS OF THE PROJECT AND THE ATC ARROWHEAD ALTERNATIVE

A. Environmental Assessment

Q. What is the purpose of this section of your Rebuttal Testimony?

A. In this section, I address potential natural and socioeconomic environmental impacts evaluated in the EA regarding Minnesota Power’s proposed Project and the ATC Arrowhead Alternative.

Q. On balance, what does the EA state regarding potential impacts to the natural and socioeconomic environments of the Project compared to the ATC Arrowhead Alternative?

A. Overall, the EA states that both the Project and the ATC Arrowhead Alternative would pose negligible to minimal environmental impacts, but that the Project compared to the ATC Arrowhead Alternative may present slightly greater impacts to aesthetics and cultural values. The EA makes this conclusion based on the fact that the HVDC Modernization Project requires construction of a new St. Louis County Substation and this substation will be located within 300 feet of Morris Thomas Road and will not be as well screened by the forested landscape as the existing Arrowhead Substation.¹

¹ Environmental Assessment at 112 (February 2024).

1 **Q. Is the Company proposing any mitigation measures to limit potential aesthetic**
2 **impacts of the new St. Louis County Substation?**

3 A. Yes. As shown in Figure 1 below, the area between Morris Thomas Road and the
4 proposed St. Louis County Substation is currently heavily wooded. Minnesota Power
5 will maintain this existing vegetation buffer between the proposed St. Louis County
6 Substation and the Morris Thomas Road. By maintaining this existing vegetation, the
7 potential visual impacts of the new St. Louis County Substation from Morris Thomas
8 Road will be minimized.

9 **Figure 1**



10
11
12 **Q. What did the EA conclude regarding the potential impacts of Minnesota Power's**
13 **proposed Project on the West Rocky Run Creek as compared to the ATC**
14 **Arrowhead Alternative?**

15 A. The EA notes that both the Project and the ATC Arrowhead Alternative would involve
16 an additional new crossing of the West Rocky Run Creek that would be cleared during

1 construction.² However, the right-of-way for Minnesota Power’s proposed Project
2 would revegetate, while the ATC Arrowhead Alternative’s new crossing would remain
3 cleared.³ The EA states that the fact that the crossing for the ATC Arrowhead
4 Alternative would remain cleared “could exacerbate warming impacts”⁴ to the West
5 Rocky Run Creek, negatively affecting trout, a cold-water fish. Therefore, while both
6 the Project and the ATC Arrowhead Alternative would involve an additional crossing
7 of West Rocky Run Creek, the EA concludes that the ATC Arrowhead Alternative’s
8 impacts to the stream could be more significant.

9
10 **Q. Did Minnesota Power propose any additional mitigation measures in its Direct**
11 **Testimony to further mitigate potential impacts of Minnesota Power’s proposed**
12 **Project on the West Rocky Run Creek?**

13 A. Yes. In my Direct Testimony I discussed that Minnesota Power is proposing to double-
14 circuit its 230 kV line between the proposed 345 kV/230 kV St. Louis County
15 Substation and Minnesota Power’s 230 kV/115 kV Arrowhead Substation to reduce the
16 crossings of the West Rocky Run Creek from two to one for Minnesota Power’s
17 configuration of the HVDC Modernization Project. Minnesota Power assumed that by
18 including this proposed mitigation measure for the crossing in its Direct Testimony, it
19 would be included in the EA. In fact, the Minnesota Department of Natural Resources
20 (“MnDNR”) requested that the EA evaluate measures to mitigate impacts to the West
21 Rocky Run Creek trout stream.⁵ However, upon review of the EA, Minnesota Power
22 does not see a double-circuit crossing of this line included in the EA.

23

² Environmental Assessment at 88-89 (February 2024).

³ Environmental Assessment at 88-89 (February 2024).

⁴ Environmental Assessment at 88 (February 2024).

⁵ McCourtney Direct at 9.

1 **Q. Has Minnesota Power provided the requisite information for this proposed double-**
2 **circuit crossing of West Rocky Run Creek for the Commission to consider this as**
3 **a mitigative measure to Minnesota Power’s proposal?**

4 A. Yes. This information was previously provided in Direct Schedule 1 of my Direct
5 Testimony. This mitigative measure would allow for the eventual revegetation of the
6 existing HVDC Line’s West Rocky Run Creek crossing. Specifically, this proposed
7 configuration would allow for Minnesota Power to maintain the one crossing of the
8 West Rocky Run Creek, as opposed to requiring two crossings. This proposal will also
9 avoid the need to expand the right-of-way from 120 feet to 260 feet, as was
10 contemplated in the Application. Instead, the final right-of-way width at West Rocky
11 Run Creek would be 130 feet to accommodate the double-circuit 230 kV transmission
12 line. The centerline of this right-of-way would be located north of the existing HVDC
13 Line right-of-way. This configuration and staging is necessary to ensure that the existing
14 HVDC Line is not taken out of service until the new infrastructure is ready to be placed
15 in service. Once the new double-circuit 230 kV line is energized, the HVDC Line would
16 be removed from this crossing and the streambanks would be allowed to revegetate.

17
18 **Q. Why did Minnesota Power not include this proposal in its earlier comments filed**
19 **with the Commission?**

20 A. Minnesota Power needed time to ensure that double-circuit construction would comply
21 with safety and reliability standards that the Company must implement across its
22 transmission system. Once Minnesota Power confirmed that double-circuit construction
23 would be consistent with these standards, the Company wanted to preview this proposal
24 with the MnDNR before submitting it to the Commission. This process required several
25 months and was not complete until shortly prior to filing Direct Testimony in this
26 proceeding.

27
28 **Q. Did the MnDNR provide the Company with any feedback regarding this proposal?**

29 A. Yes, the MnDNR appreciated the Company taking the additional time to evaluate this
30 possibility to maintain a single crossing, adjacent to the existing location, of the West

1 Rocky Run Creek and allow revegetation of the existing crossing after completion of
2 construction.

3
4 **Q. Does the EA make any distinctions between Minnesota Power’s proposed HVDC**
5 **Modernization Project and the ATC Arrowhead Alternative related to potential**
6 **impacts to avian species?**

7 A. Yes, the EA notes that ATC’s proposed transmission line design will meet Avian Power
8 Line Interaction Committee (“APLC”) Avian Protection Guidelines⁶ but does not make
9 the same statement with regard to Minnesota Power’s proposed design.

10
11 **Q. Will Minnesota Power’s transmission line designs also comply with APLC Avian**
12 **Protection Guidelines?**

13 A. Yes. Minnesota Power’s transmission line design will comply with Avian Power Line
14 Interaction Committee’s Avian Protection Guidelines to minimize avian fatalities
15 associated with its high voltage transmission lines. In addition, Minnesota Power will
16 coordinate with the MnDNR regarding the installation of bird flight diverters for the
17 project.

18
19 **Q. Do you have any other observations about the EA’s Analysis?**

20 A. Yes. Three of the maps in the EA do not accurately indicate Minnesota Power’s
21 ownership of a portion of the Arrowhead Substation (Map 5- Land Cover, Map 6-
22 Zoning and Map 8 Physiographic Features). These maps have been corrected and are
23 included as Rebuttal Schedules 1, 2 and, 3.

24

⁶ Environmental Assessment at 95 (February 2024).

1 **B. Response to ATC Direct Testimony**

2 **Q. Did ATC provide Direct Testimony regarding impacts to the natural and**
3 **socioeconomic environments of the Project compared to the ATC Arrowhead**
4 **Alternative?**

5 A. Yes. ATC witness Amy Lee addressed environmental impacts of the ATC Arrowhead
6 Alternative, ATC witness Dustin Johanek addresses impacts due to noise, public health
7 and safety, public services, and transportation, and ATC witness Michael Bradley
8 addresses impacts to residences and aesthetics. As I discuss below, Ms. Lee's discussion
9 of the environmental impacts of the ATC Arrowhead Alternative does not take into
10 account that the ATC Arrowhead Alternative requires construction of the HVDC
11 Converter Station as well as the short ± 250 kV interconnect transmission line.
12 Additionally, Ms. Lee's discussion of environmental impacts of Minnesota Power's
13 proposed HVDC Modernization Project does not account for the fact that, as I discussed
14 above, Minnesota Power is proposing to double-circuit its 230 kV transmission line
15 across the West Rocky Run Creek to provide a single crossing of this stream within a
16 130 foot-wide right-of-way. I also disagree with the certain statements made by ATC
17 witness Mr. Johanek regarding greenhouse gas emissions ("GHG") calculations and
18 ATC witness Mr. Bradley regarding impacts to residences and aesthetics.

19
20 **Q. What required Project components are missing from ATC witness Ms. Lee's**
21 **discussion of potential impacts of ATC Arrowhead Alternative?**

22 A. Ms. Lee's analysis of environmental impacts ignores that both Minnesota Power's
23 proposed Project and the ATC Arrowhead Alternative require the construction of the
24 HVDC converter station and the 250 kV HVDC transmission interconnect line from the
25 existing 250 kV line to the HVDC converter station. Both the HVDC converter station
26 and the 250 kV HVDC interconnect line are in the same location for either alternative.

1 **Q. Would including these project components into ATC's Arrowhead Alternative**
2 **change ATC's estimated wetland impacts?**

3 A. Yes, the wetland impacts for the proposed Project and ATC's Alternative are addressed
4 in Table 22 of the EA.⁷ These wetland impacts are significantly different than was
5 provided in Ms. Lee's direct testimony. In her Direct Testimony, Ms. Lee states that the
6 ATC Arrowhead Alternative will "only require the conversion of 2.96 acres of forested
7 wetland" whereas the EA concludes that the Arrowhead Alternative will result in 4.20
8 acres of wetland conversion.⁸ In addition, Ms. Lee's direct testimony states that the
9 Arrowhead Alternative will result in "approximately 70 square feet of permanent
10 impact."⁹ However, the EA concludes that "based on the amount of wetland to be
11 covered by the Converter Station in addition to permanently converted wetland, both of
12 which weren't included in ATC's estimate, this number is more likely 6.6 acres."¹⁰

13
14 **Q. Does ATC witness Ms. Lee's environmental analysis take into account Minnesota**
15 **Power's proposal to double-circuit its 230 kV line across the West Rocky Run**
16 **Creek?**

17 A. No, and as I discussed above, this is a significant mitigation measure for Minnesota
18 Power's proposed configuration of the HVDC Modernization Project as it will reduce
19 the number of crossings of the West Rocky Run Creek from two to one, which is the
20 same number of crossings currently there, and will narrow the required right-of-way
21 width from 260 feet to 130 feet.

22
23 **Q. What statements in Mr. Johanek's Direct Testimony regarding GHG calculations**
24 **do you disagree with?**

25 A. In his Direct Testimony Mr. Johanek estimates the amount of greenhouse gas ("GHG")
26 emissions that may be associated with the ATC Arrowhead Alternative. Mr. Johanek
27 also states that ATC is not aware that Minnesota Power provided a breakout of GHG

⁷ Environmental Assessment at 117 (February 2024).

⁸ Compare Lee Direct at 8 to Environmental Assessment at 117, Table 22 (February 2024).

⁹ Lee Direct at 8-9.

¹⁰ Environmental Assessment at 117 (February 2024).

emissions for the proposed St. Louis County 345 kV/230 kV Substation and associated new transmission lines.

Q. Is it appropriate to calculate GHG emissions on an individual project component basis?

A. No. GHG emissions are most accurately calculated on a project basis and should not be separated into individual project components. Minnesota Power prepared an estimate of GHG emissions for the entire HVDV Modernization Project and this estimate is included in Appendix H to the EA. ATC's GHG emissions calculations should include the HVDC Converter station, the 250 kV HVDC interconnect as well as their proposed 345 kV transmission line in order to get an apples-to-apples comparison with Minnesota Power's GHG calculations for its proposed Project. Currently, ATC's GHG estimates only include construction of its 345 kV transmission line.

Q. What does Mr. Bradley conclude regarding impacts to residences and aesthetics?

A. Mr. Bradley concludes that Minnesota Power's proposed Project would require displacement of six residences whereas the ATC Arrowhead Alternative would not.¹¹ In addition, Mr. Bradley described how aesthetic impacts would be minimized because the ATC Arrowhead Alternative would not require construction of the St. Louis County 345 kV/230 kV Substation.

Q. Is this accurate?

A. No. As of January 30, 2024, Minnesota Power acquired all the parcels necessary for its proposed HVDC Modernization Project through voluntary land sales with the property owners. As a result, there will be no displacement of either residences or business to construct Minnesota Power's proposed HVDC Modernization Project.¹² In addition, as

¹¹ Bradley Direct at 10-11.

¹² Environmental Assessment at 103 ("To the extent possible, the project will be constructed on land owned by Minnesota Power. In that case, the project will not use traditional transmission line easements for right-of-way. No residence or business is expected to be removed for either the proposed project of the ATC Alternative to facilitate construction and operation. Minnesota Power has acquired all parcels within the proposed route as of January 30, 2024.")

1 I discussed above, Minnesota Power will maintain the existing vegetation buffer
2 between the proposed St. Louis County Substation and the Morris Thomas Road north
3 of the Project area to minimize potential visual impacts from Minnesota Power's
4 proposed Project.

5
6 **III. UPDATES AND CLARIFICATIONS FROM DIRECT TESTIMONY**

7 **A. Noise Study**

8 **Q. What did you state in your Direct Testimony regarding the Company's proposed**
9 **mitigation measures regarding noise concerns from the HVDC converter station?**

10 A. I stated that Minnesota Power had commissioned a study related to noise anticipated
11 from the HVDC converter station equipment based on the current equipment design.¹³
12 I explained that this study was underway at the time and that Minnesota Power would
13 provide the noise study with Rebuttal Testimony along with any mitigation measures,
14 if necessary.

15
16 **Q. Has the noise study been completed?**

17 A. Yes, it has. I include the noise study as Rebuttal Schedule 4.

18
19 **Q. Please provide an overview of the noise study.**

20 A. Siemens Energy conducted a noise study for Minnesota Power's proposed Project. The
21 noise ring in Rebuttal Schedule 4 shows the worst-case scenario associated with the
22 Project and does not include the results from any additional/voluntary noise mitigation
23 measures that will be incorporated into final project design.

24
25 **Q. What are the results of the noise study?**

26 A. The noise study shows that the Project will be below the Minnesota Pollution Control
27 Agency's ("MPCA") most stringent standard, the 50 dBA nighttime limit,¹⁴ at any of
28 the identified noise receptors (homes) near the HVDC converter station

¹³ McCourtney Direct at 12.

¹⁴ Table 7 on page 44 of the Environmental Assessment provides a summary of the MPCA noise standards.

1
2 **Q. Is Minnesota Power proposing any specific noise mitigation measures for the**
3 **HVDC converter station?**

4 A. While the noise from the HVDC converter station will be below MPCA noise limits,
5 Minnesota Power is currently evaluating additional/voluntary noise mitigation
6 measures. These measures could include construction of sound baffling technologies,
7 directional placement of the noise-emitting equipment, and other mitigation measures.
8 Minnesota Power is working closely with its HVDC supplier on the impact of these
9 various noise mitigation measures and may implement these mitigation measures into
10 the final design of the Project.

11
12 **B. Corrections to Direct Testimony**

13 **Q. Do you have any corrections to your Direct Testimony.**

14 A. Yes. I have two corrections to the table provided as Direct Schedule 1 to my Direct
15 Testimony. The acres of agricultural cropland and grassland for the ATC Alternative
16 were incorrect. A redline version showing these changes is provided below and a
17 corrected version of the entire Direct Schedule 1 is provided as Rebuttal Schedule 5.

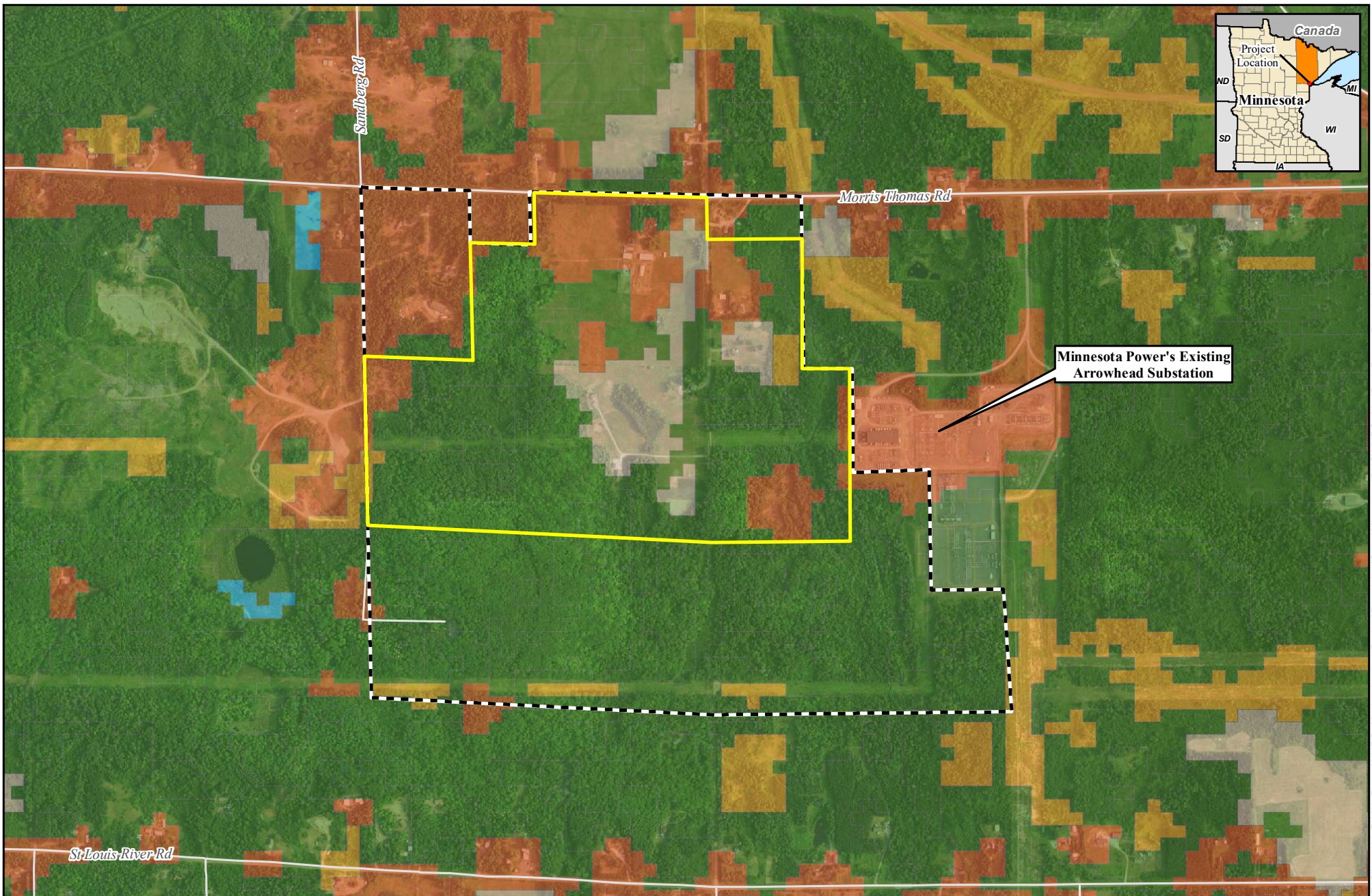
18 **Table 1**

Land Cover, Acres within ROW by Type	HVDC Proposed Route	HVDC Alternative 1	ATC Alternative 1
Agricultural/Cropland	7.55	6.65	3.10 <u>2.32</u>
Grassland	1.07	0.92	0 <u>0.77</u>

19
20 **IV. CONCLUSION**

21 **Q. Does this complete your Rebuttal Testimony?**

22 A. Yes.



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0 500 1,000
Feet
1 inch = 1,000 feet



For Environmental Review Purposes Only

Map 5 - Land Cover

St. Louis County, Minnesota

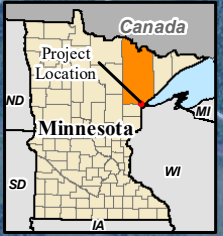
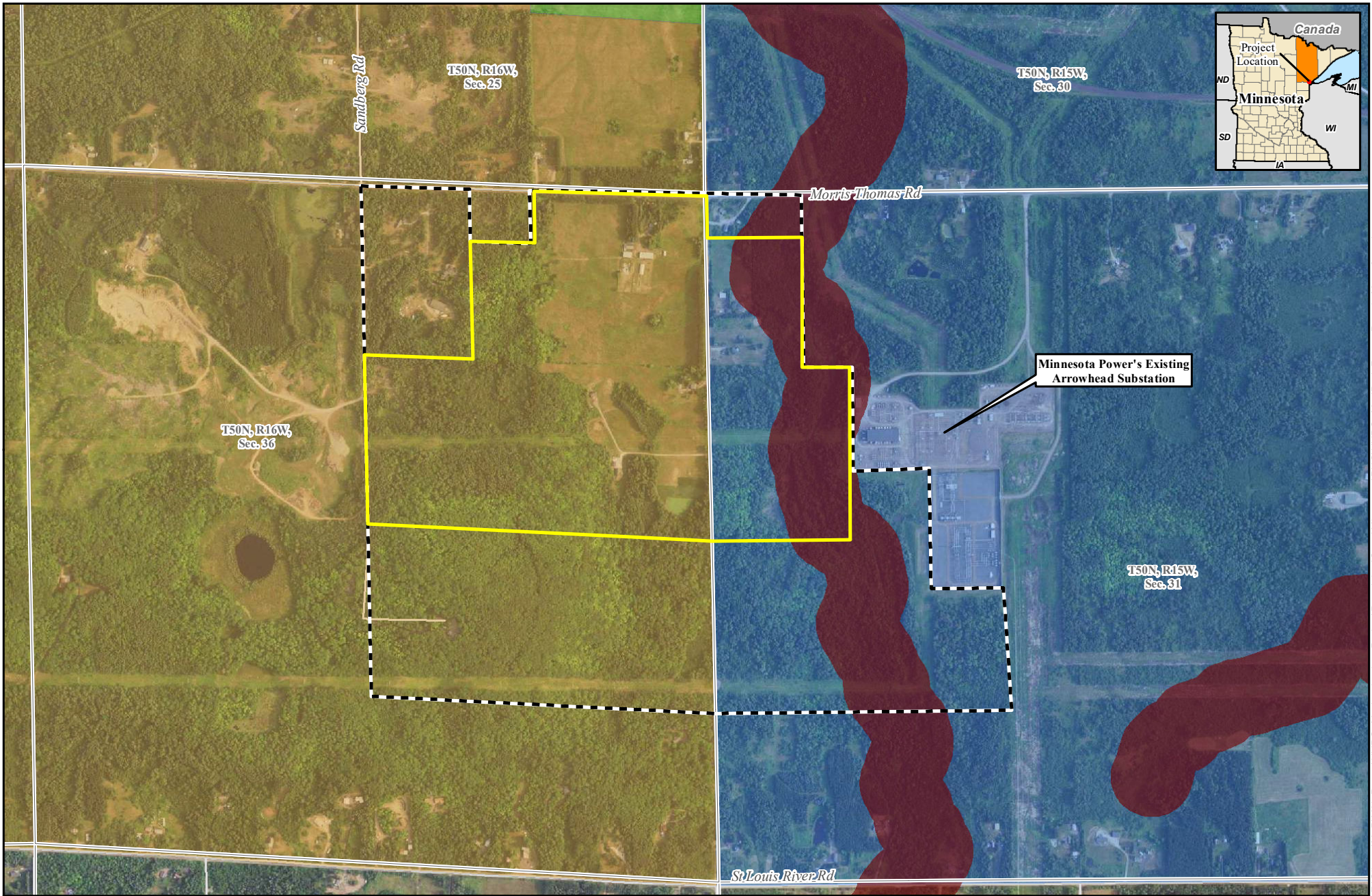
Proposed Route
 Project Study Area

Land Cover (GAP)
 Aquatic
 Forested Land
 Cropland
 Developed
 Grassland

OAH Docket No. 5-2500-39600
MPUC Docket Nos. E015/CN-22-607
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Rebuttal Schedule 1

Page 1 of 1



Merjent.

0 500 1,000 Feet

1 inch = 1,000 feet

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North Arrow: N, S, E, W

Map 6 - Zoning

St. Louis County, Minnesota

Legend:

- Proposed Route
- Project Study Area
- TRS Boundary
- Forest Agricultural Management
- Residential (RES-3)
- Rural Residential (S1)
- Natural Environment Shoreland Zone

Map Labels:

- Sandberg Rd
- 150N, R16W, Sec. 25
- 150N, R16W, Sec. 36
- Morris Thomas Rd
- 150N, R15W, Sec. 30
- 150N, R15W, Sec. 31
- St. Louis River Rd
- Minnesota Power's Existing Arrowhead Substation

Scale: 0 500 1,000 Feet
 1 inch = 1,000 feet

North Arrow: N, S, E, W

Merjent.

Legend:

- Proposed Route
- Project Study Area
- TRS Boundary
- Forest Agricultural Management
- Residential (RES-3)
- Rural Residential (S1)
- Natural Environment Shoreland Zone

Map Labels:

- Sandberg Rd
- 150N, R16W, Sec. 25
- 150N, R16W, Sec. 36
- Morris Thomas Rd
- 150N, R15W, Sec. 30
- 150N, R15W, Sec. 31
- St. Louis River Rd
- Minnesota Power's Existing Arrowhead Substation

Scale: 0 500 1,000 Feet
 1 inch = 1,000 feet

North Arrow: N, S, E, W

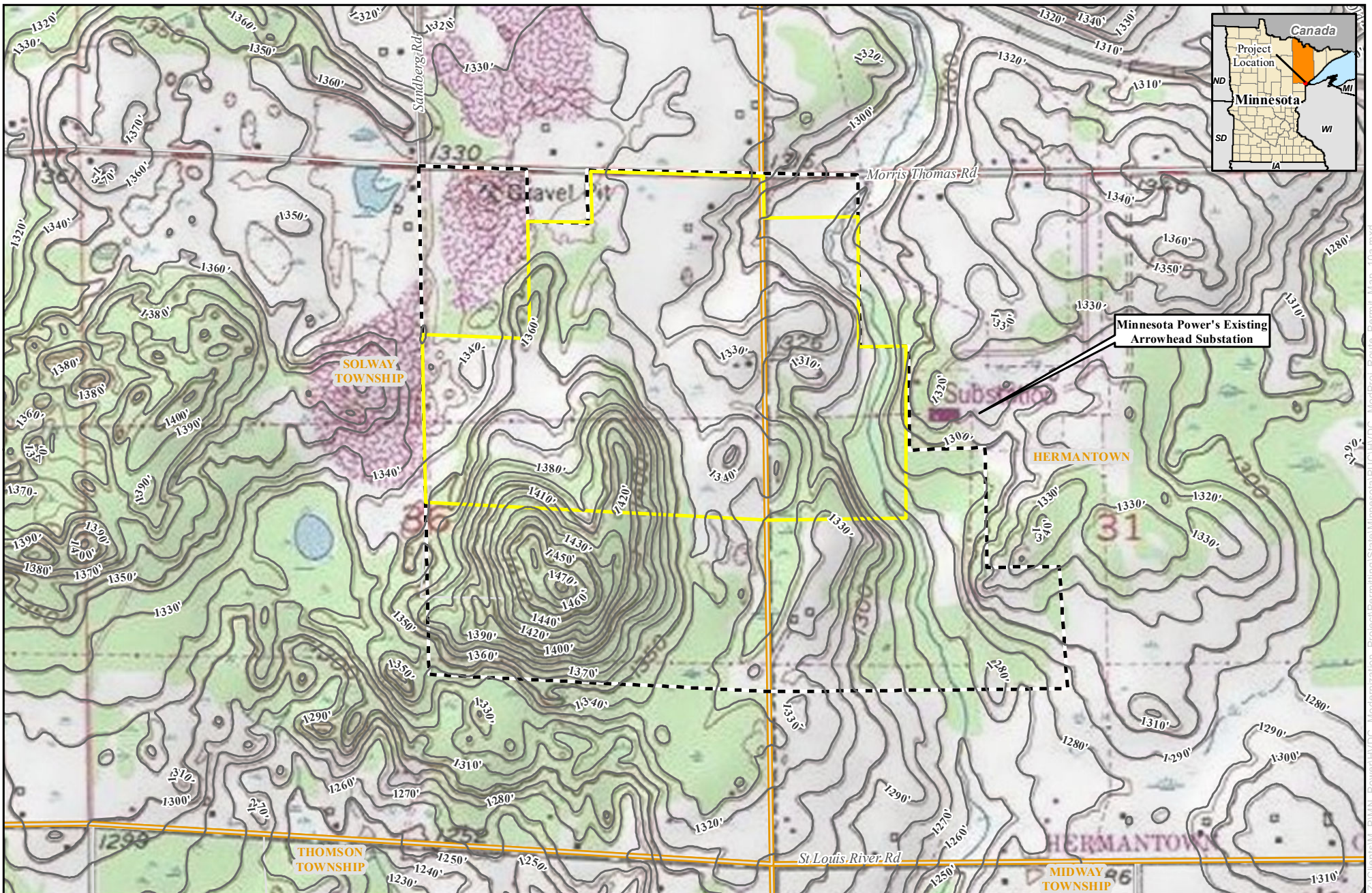
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Rebuttal Schedule 2

Page 1 of 1

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0 500 1,000 Feet

1 inch = 1,000 feet

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N
W E
S

Map 8 - Physiographic Features - Topography

St. Louis County, Minnesota

OAH Docket No. 5-2500-39600
MPUC Docket Nos. E015/CN-22-607
and E015/TL-22-611
MP Exhibit (McCourtney)

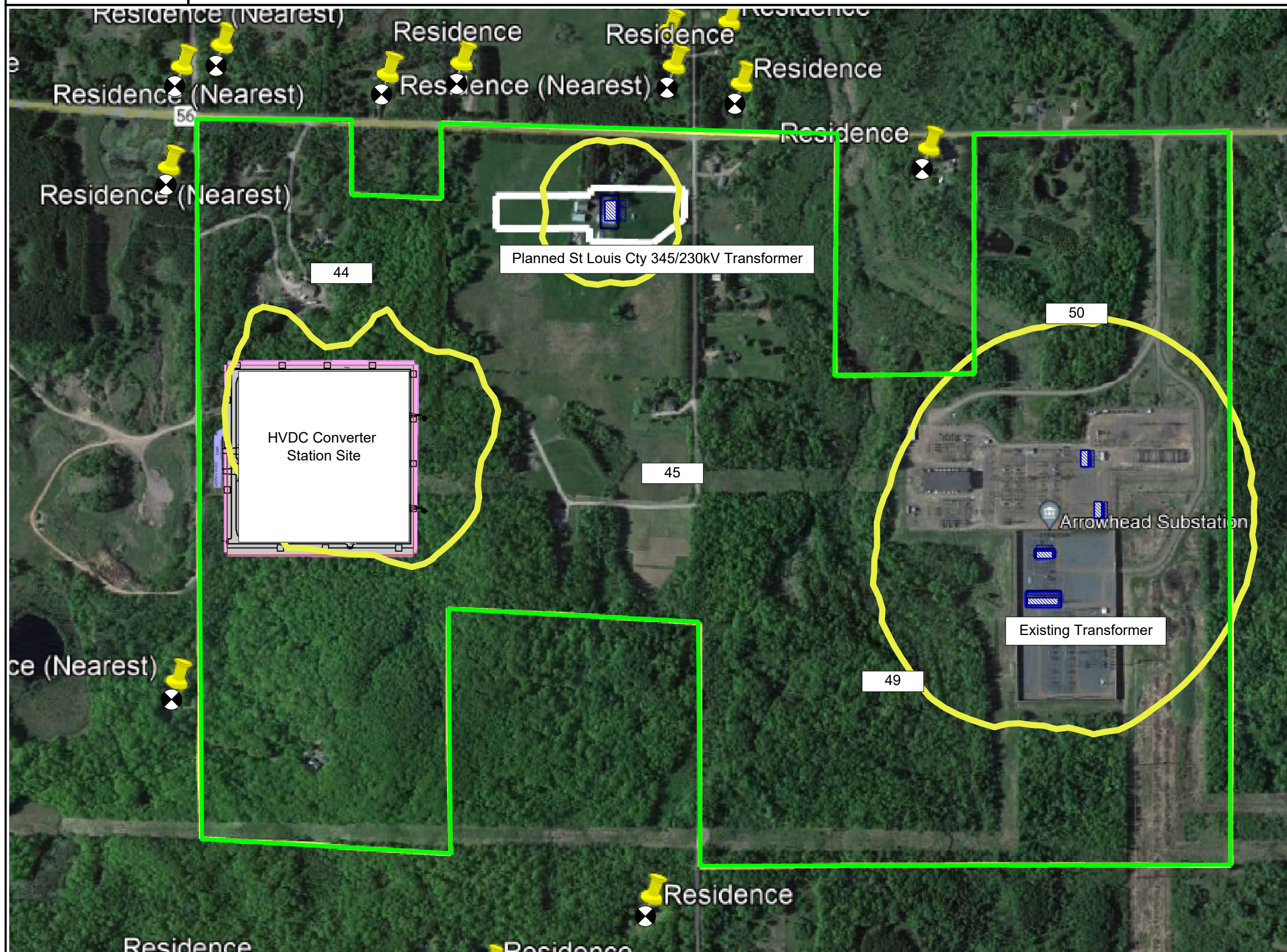
10' Contour

Proposed Route

Project Study Area

Municipal Boundary

Minnesota Power HVDC Project, UM12 Converter Station
Monopole 900MW, stable operation fully energized



- + Point Source
- Area Source
- vert. Area Source
- Building
- Cylinder
- Barrier
- Ground Absorption
- Receiver
- Calculation Area

Noise Contour Map
50 dB(A), yellow line,
in 5ft (1,5m) height

For information only,
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execution

Siemens Energy Global GmbH & Co. KG
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Date:
07.03.2024

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OAH Docket No. 5-2500-39600
MPUC Docket Nos. E015/CN-22-607

and E015/TL-22-611
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Rebuttal Schedule 4
Page 1 of 1

Page:
1/1

MINNESOTA POWER'S REVISED ROUTE ALTERNATIVE ANALYSIS

The following table is Minnesota Power's ("MP") Land Impact Analysis for MP's Proposed HVDC Project included in Minnesota Power's Certificate of Need and Route Permit Application ("Application") filed on June 1, 2023 ("MP HVDC Project as proposed in Application"), MP's updated Proposed Route filed on September 13, 2023 ("MP HVDC Project"), and ATC's Arrowhead Alternative provided December 7, 2023 to the Department of Commerce, Energy Environmental Review and Analysis ("DOC EERA") ("ATC Arrowhead Alternative"). A visual depiction of each of the alternatives included in this analysis is provided in Attachment A.

RESOURCE	MP HVDC PROJECT AS PROPOSED IN APPLICATION	MP HVDC PROJECT ¹	ATC ARROWHEAD ALTERNATIVE ²
Total Area in Acres	31.8	28.7	25.14
Land Cover, Acres within ROW by Type	See Separate Table	See Separate Table	See Separate Table
Delineated Wetlands within ROW, in Acres	5.9	5.4	4.93
Delineated Waterbodies, Number / Acres within ROW	1 / 0.13	1 / 0.07	2 / 0.05
Farmland of Statewide Importance	8.6 acres	6.7 acres	5.3 acres
Not Prime Farmland	23.2 acres	22.0 acres	19.8 acres
PWI Minnesota Public Waters – West Rocky Run	2 crossings	1 crossing	1 crossing
Minnesota Trout Streams – West Rocky Run	2 crossings	1 crossing	1 crossing
Impaired Streams – West Rocky Run	2 crossings	1 crossing	1 crossing



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MINNESOTA POWER'S REVISED ROUTE ALTERNATIVE ANALYSIS

RESOURCE	MP HVDC PROJECT AS PROPOSED IN APPLICATION	MP HVDC PROJECT ¹	ATC ARROWHEAD ALTERNATIVE ²
Water Wells - Domestic	0	0	0
Floodplains – 100-Year Floodplain, West Rocky Run	0.83 acre	0.61 acres	0.84 acres
Parcels / Landowners	8 parcels / 1 landowner (Minnesota Power)	8 parcels / 1 landowner (Minnesota Power)	8 parcels / 1 landowner (Minnesota Power)

¹ Minnesota Power's Route Alternative filed on 9/13/23 with proposed double-circuit 230 kV.

² ATC's Proposed Route Alternative for its Arrowhead Alternative as of 12/7/2023 as provided by Minnesota DOC EERA.

LAND COVER, ACRES WITHIN ROW BY TYPE	MP HVDC AS PROPOSED IN APPLICATION	MP HVDC PROJECT ¹	ATC ARROWHEAD ALTERNATIVE ²
Agricultural/Cropland	7.55	6.65	2.32*
Forest/Shrub	18.18	16.64	18.19
Grassland	1.07	0.92	0.77*
Developed Land	1.31	1.54	0
Wetland (NLCD wetlands, not Delineated Wetlands)	3.67	2.98	3.86
Total	31.8	28.7	25.1

¹ Minnesota Power's Route Alternative filed on 9/13/2023 with proposed double-circuit 230 kV.

² ATC's Proposed Route Alternative for its Arrowhead Alternative as of 12/7/2023 as provided by Minnesota DOC-EERA.

*All NLCD Land Cover categories present within the evaluated routes were reclassified to match ATC's requested land use categories, as shown in the table below. In the Land Cover comparison table that was provided in December 2023,

OAH Docket No. 5-2500-39600
MPUC Docket Nos. E015/CN-22-607

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MP Exhibit ____ (McCourtney)

Rebuttal Schedule 5

Page 2 of 3



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MINNESOTA POWER'S REVISED ROUTE ALTERNATIVE ANALYSIS

approximately 0.77 acre of “herbaceous” land was mistakenly included in the Agricultural/Cropland category for the ATC Arrowhead Alternative *only* instead of in the Grassland category as intended. A correction has been made in this table to include “herbaceous” land in the Grassland category for the ATC Arrowhead Alternative just as was done for the HVDC routes. The updated Land Cover table above reflects this correction.

NLCD Land Cover Classifications were reclassified to match ATC's land use categories as follows:

NLCD Land Cover Classification	Reclassification for Land Cover Comparisons
Deciduous Forest	Forest/Shrub
Hay/Pasture	Agricultural/Cropland
Herbaceous	Grassland
Shrub/Scrub	Wetland
Woody Wetlands	Wetland
Developed Low/Medium/High Intensity / Developed Open Space	Developed Land