

NOTES:

- 1. Conductor blowout analysis is conducted in accordance with the criteria of the National Electric Safety Code (NESC).
- 2. Conductor blowout measurements are calculated at mid-span where worst-case conductor displacement occurs.
- 3. Where total road ROW is less than 200' and poles are less than 15' from ROW line, TP-115B structures shall be installed. See Figure 3B for details.
- 4. Proposed conductor size is 336 kcmil ACSR, Linnet.

NESC CONDUCTOR BLOWOUT SUMMARY

POLE FRAMING =	TP-115
WIND SPEED (MPH) =	48.5
APPROXIMATE MAXIMUM POLE SPAN =	307.0 FT
"X" - BLOWOUT DISTANCE (FROM POLE CENTERLINE) =	9.07 FT
"Y" - BLOWOUT DISTANCE (FROM CONDUCTOR ATTACHMENT) =	4.07 FT
"Z" - CLEARANCE FROM ROW TO DISPLACED CONDUCTOR =	5.93 FT

ROW DETAIL  
TYPICAL  
115 kV STRUCTURE  
TP-115

REV	DATE	DESCRIPTION

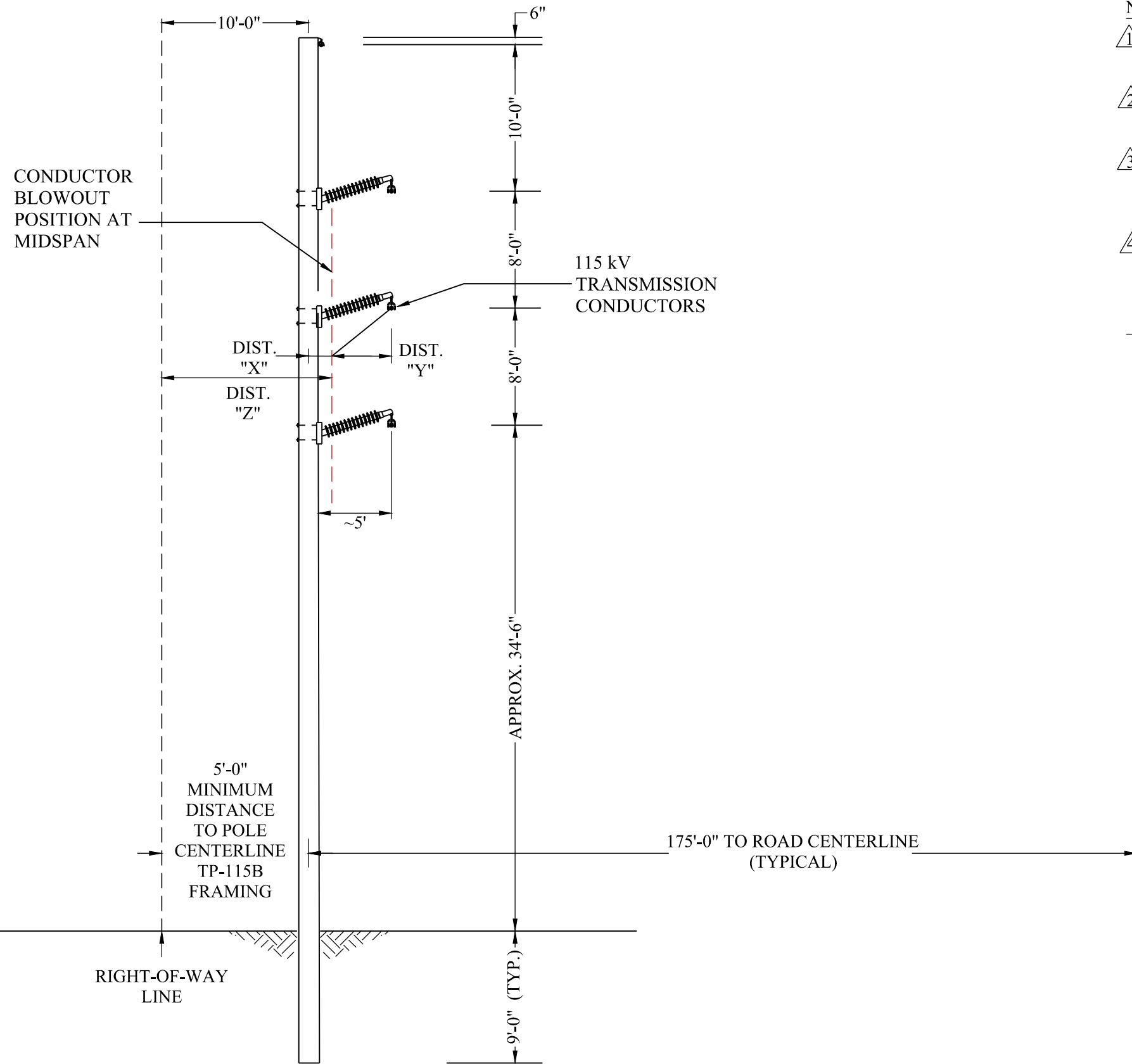


Project Manager: DJH  
 Designer: JDL  
 Project Number: 419115  
 Phone: (712) 472-2531

DETROIT LAKES PUBLIC UTILITIES  
 DETROIT LAKES, MN

115 kV TRANSMISSION LINE  
 SOUTH SUBSTATION

SHEET  
 FIGURE 3A



NOTES:

- 1. Conductor blowout analysis is conducted in accordance with the criteria of the National Electric Safety Code (NESC).
- 2. Conductor blowout measurements are calculated at mid-span where worst-case conductor displacement occurs.
- 3. Where total road ROW is 200' or greater and poles are 15' or more from the ROW line, TP-115 structures shall be installed. See Figure 3A for details.
- 4. Proposed conductor size is 336 kcmil ACSR, Linnet.

NESC CONDUCTOR BLOWOUT SUMMARY

POLE FRAMING =	TP-115B
WIND SPEED (MPH) =	48.5
APPROXIMATE MAXIMUM POLE SPAN =	307.0 FT
"X" - BLOWOUT DISTANCE (FROM POLE CENTERLINE) =	0.93 FT
"Y" - BLOWOUT DISTANCE (FROM CONDUCTOR ATTACHMENT) =	4.07 FT
"Z" - CLEARANCE FROM ROW TO DISPLACED CONDUCTOR =	10.93 FT

ROW DETAIL  
TYPICAL  
115 kV STRUCTURE  
TP-115B

REV	DATE	DESCRIPTION

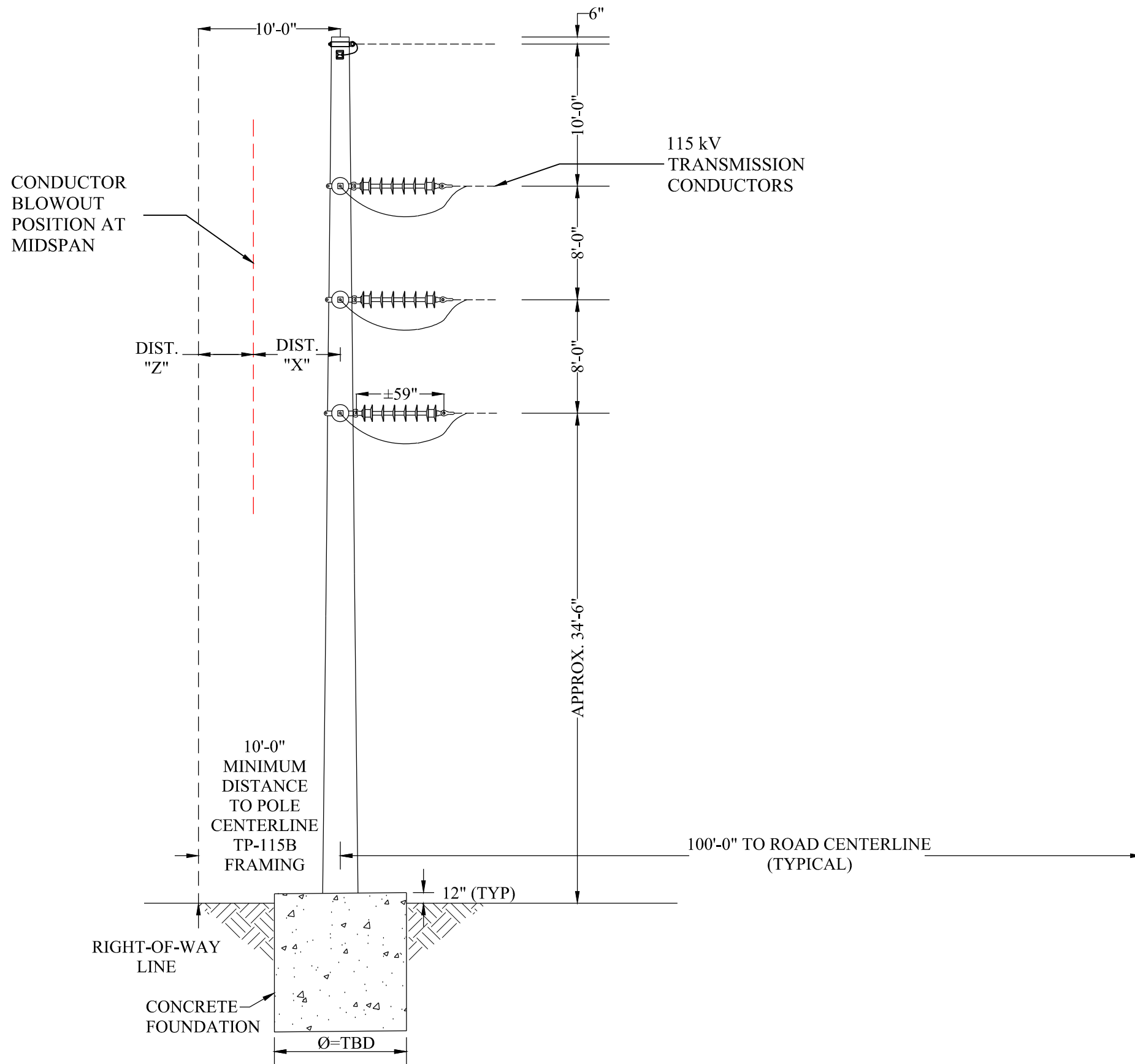


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DETROIT LAKES PUBLIC UTILITIES  
DETROIT LAKES, MN

115 kV TRANSMISSION LINE  
SOUTH SUBSTATION

SHEET  
FIGURE 3B



NOTES:

- 1. Conductor blowout analysis is conducted in accordance with the criteria of the National Electric Safety Code (NESC).
- 2. Conductor blowout measurements are calculated at mid-span where worst-case conductor displacement occurs.
- 3. Proposed conductor size is 336 kcmil ACSR, Linnet.

NESC CONDUCTOR BLOWOUT SUMMARY

POLE FRAMING =	TS-5G
WIND SPEED (MPH) =	48.5
APPROXIMATE MAXIMUM POLE SPAN =	309.0 FT
"X" - BLOWOUT DISTANCE (FROM POLE CENTERLINE) =	6.12 FT
"Z" - CLEARANCE FROM ROW TO DISPLACED CONDUCTOR =	3.88 FT

ROW DETAIL  
TYPICAL  
115 kV STRUCTURE  
TS-5G

REV	DATE	DESCRIPTION

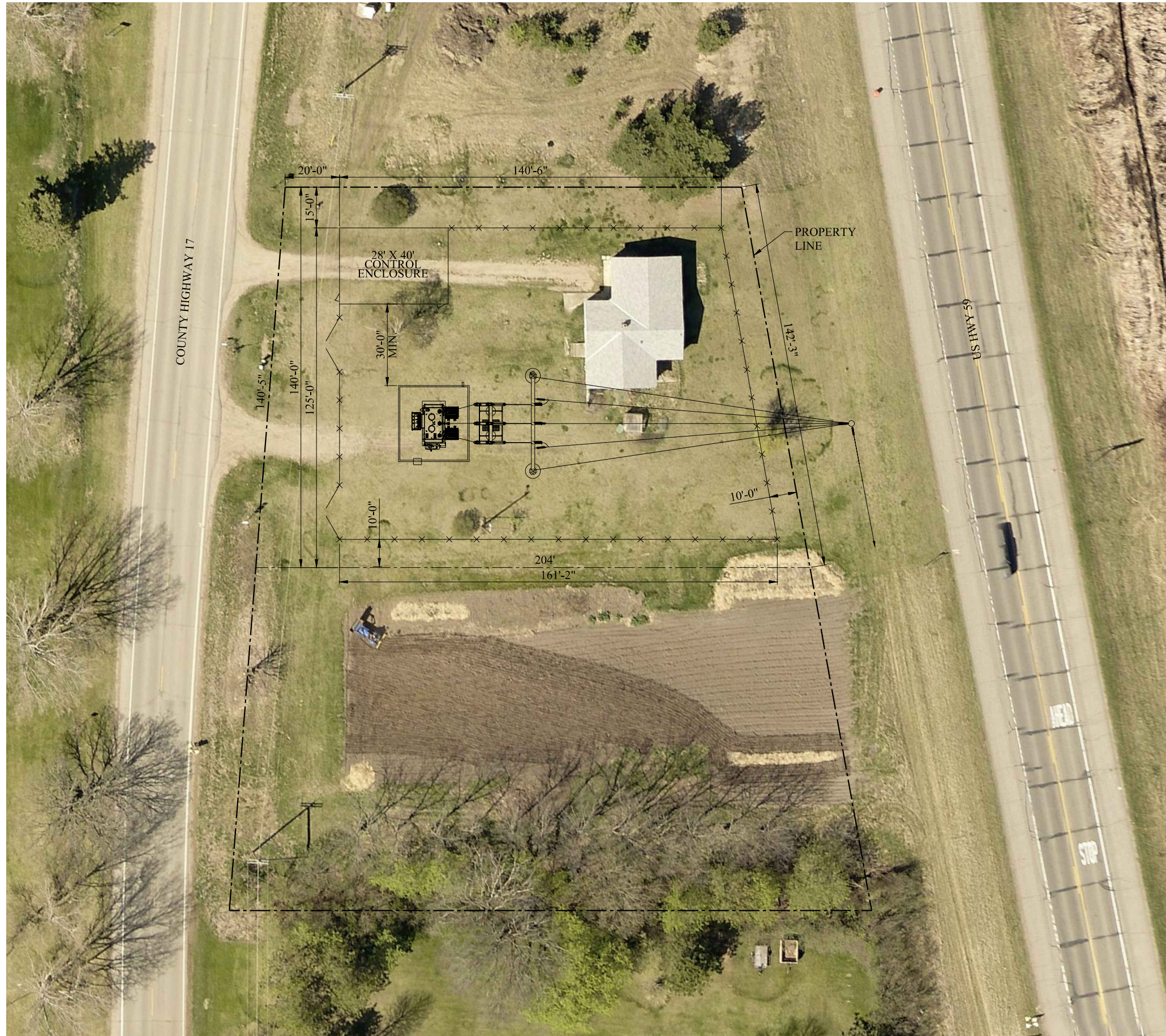


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DETROIT LAKES PUBLIC UTILITIES  
DETROIT LAKES, MN

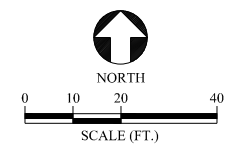
115 kV TRANSMISSION LINE  
SOUTH SUBSTATION

SHEET  
FIGURE  
3C



**LEGEND**

	PROPERTY LINE
	FENCE LINE



REV	DATE	DESCRIPTION
0	3-16-18	PRELIMINARY



Project Manager: PAD  
 Designer: BRM  
 Project Number: 419115  
 Phone: (712) 472-2531

DETROIT LAKES PUBLIC UTILITIES  
 DETROIT LAKES, MINNESOTA

FUTURE SOUTH SUBSTATION LAYOUT

APPENDIX A  
 FIGURE 4

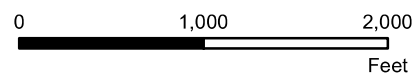
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T 138N



Image Source: 2017 Farm Service Agency

- Proposed 115kV Transmission Line Alignment
- Proposed 115kV Substation Site
- Existing GRE 115kV Transmission Line
- Existing Detroit Lakes 12.47 kV Distribution
- Existing Detroit Lakes 7.2 kV Distribution
- - - Underground
- Overhead



**Appendix A Figure 5**  
**EXISTING ELECTRIC INFRASTRUCTURE MAP**  
**Proposed 115 kV Transmission Line**  
**Detroit Lakes Public Utilities**  
**Becker County, MN**

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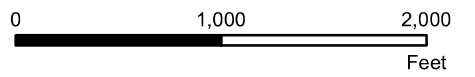
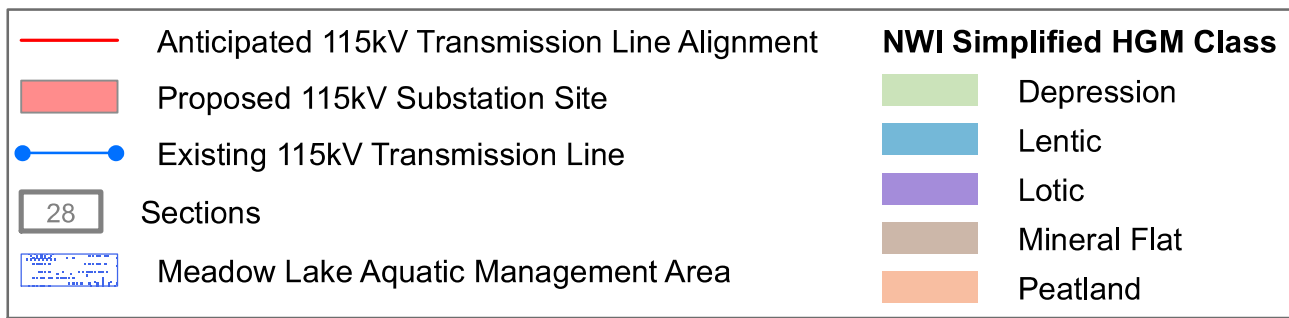
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P:\04191115\GIS\Wetland Inventory.mxd

Image Source: 2017 Farm Service Agency



Appendix A Figure 6  
 Wetland Inventory  
 Proposed 115 kV Transmission Line  
 Detroit Lakes Public Utilities  
 Becker County, MN

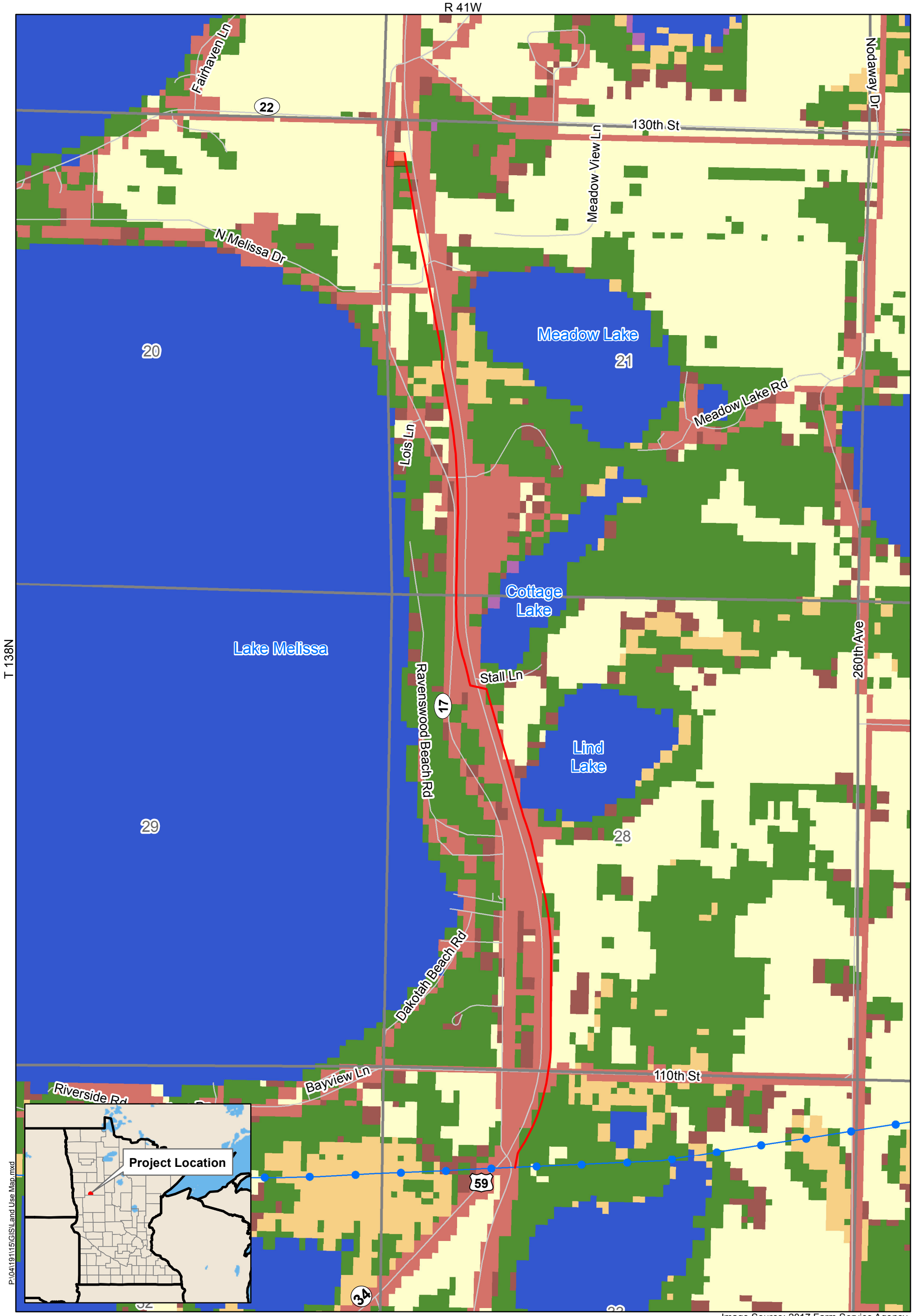
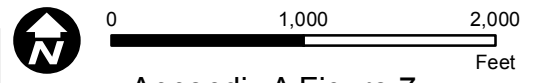
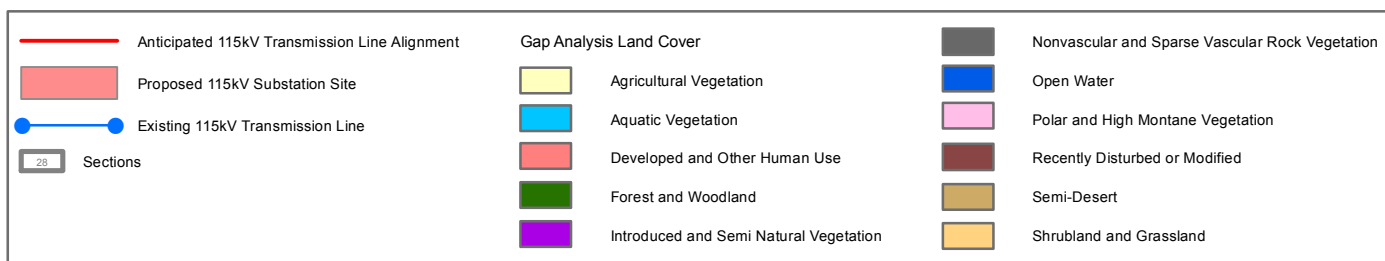


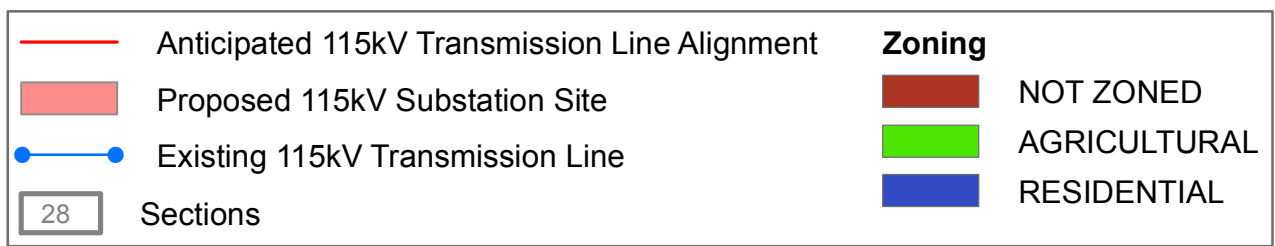
Image Source: 2017 Farm Service Agency



Appendix A Figure 7  
 Existing Land Use  
 Proposed 115 kV Transmission Line  
 Detroit Lakes Public Utilities  
 Becker County, MN



Image Source: 2017 Farm Service Agency



Appendix A Figure 8  
 County Zoning  
 Proposed 115 kV Transmission Line  
 Detroit Lakes Public Utilities  
 Becker County, MN



**APPENDIX A TABLE 1**  
**ENDANGERED AND THREATENED SPECIES BECKER COUNTY**  
**DLPV 115 KV HVLT**

Common name	Scientific name	Group	Federal status	State status
A Caddisfly	<u>Oxyethira ecornuta</u>	insect	none	threatened
Beaked Spikerush	<u>Eleocharis rostellata</u>	vascular plant	none	threatened
Bog Adder's Mouth	<u>Malaxis paludosa</u>	vascular plant	none	endangered
Common Tern	<u>Sterna hirundo</u>	bird	none	threatened
Goblin Fern	<u>Botrychium mormo</u>	vascular plant	none	threatened
Hair-like Beak Rush	<u>Rhynchospora capillacea</u>	vascular plant	none	threatened
Hidden-fruit Bladderwort	<u>Utricularia geminiscapa</u>	vascular plant	none	threatened
Horned Grebe	<u>Podiceps auritus</u>	bird	none	endangered
Louisiana Broomrape	<u>Orobanche ludoviciana</u> var. <u>ludoviciana</u>	vascular plant	none	threatened
Northern Long-eared Bat	<u>Myotis septentrionalis</u>	mammal	threatened	special concern
Oakes' Pondweed	<u>Potamogeton oakesianus</u>	vascular plant	none	endangered
Olivaceous Spikerush	<u>Eleocharis flavescens</u> var. <u>olivacea</u>	vascular plant	none	threatened
Poweshiek Skipperling	<u>Oarisma poweshiek</u>	insect	endangered	endangered
Pugnose Shiner	<u>Notropis anogenus</u>	fish	none	threatened
Ram's Head Orchid	<u>Cypripedium arietinum</u>	vascular plant	none	threatened
Rock Sandwort	<u>Minuartia dawsonensis</u>	vascular plant	none	threatened
Sheathed Pondweed	<u>Stuckenia vaginata</u>	vascular plant	none	endangered
Sterile Sedge	<u>Carex sterilis</u>	vascular plant	none	threatened
Stream Parsnip	<u>Berula erecta</u>	vascular plant	none	threatened
Whorled Nutrush	<u>Scleria verticillata</u>	vascular plant	none	threatened
Wilson's Phalarope	<u>Phalaropus tricolor</u>	bird	none	threatened