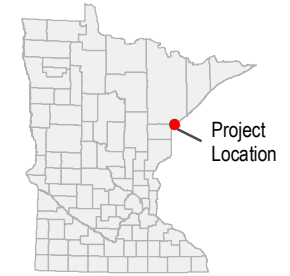
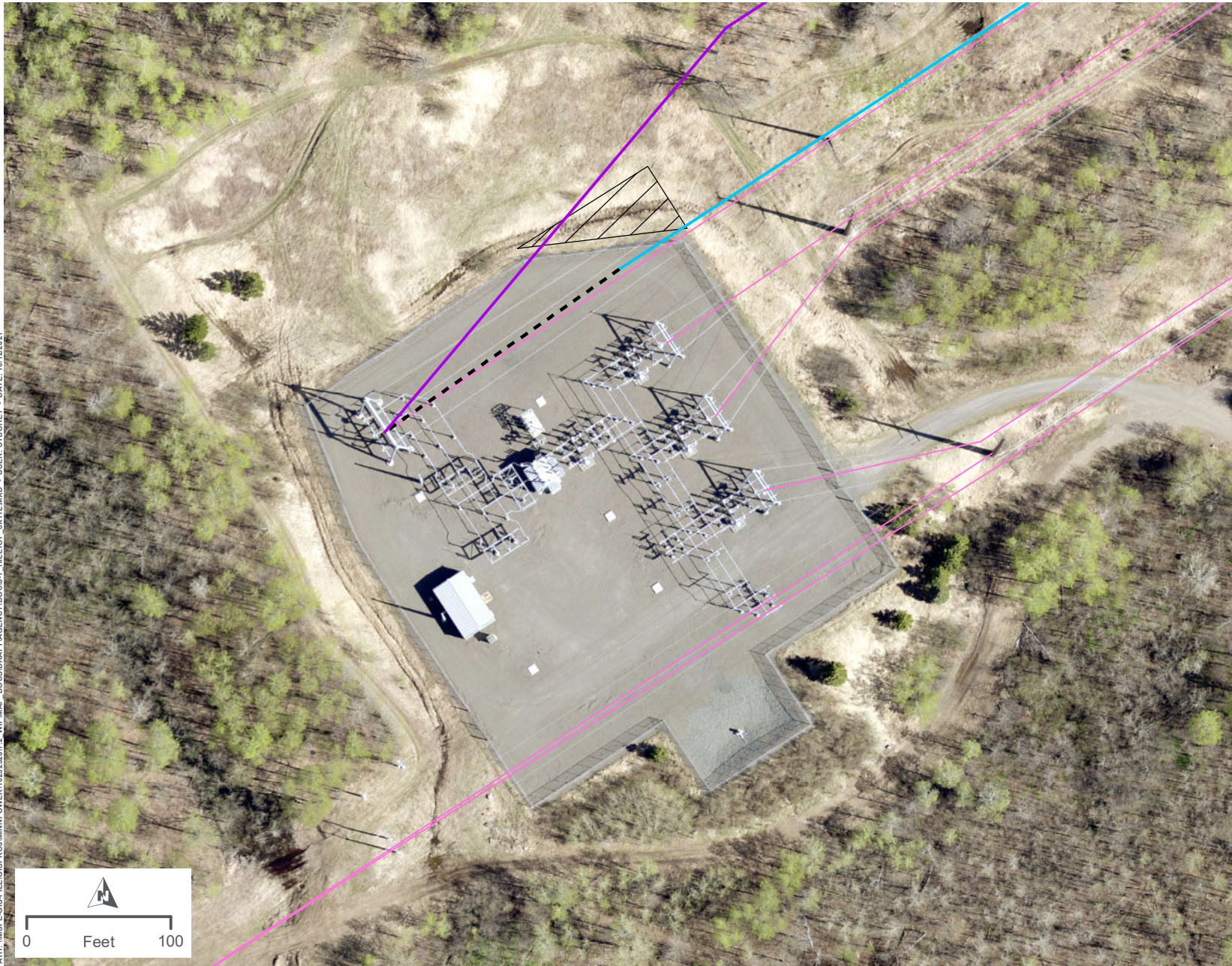







APPENDIX J

DETAILED ROUTE MAPS AND FIGURES SHOWING THE RIDGEVIEW SUBSTATION AND HILLTOP SUBSTATION EXPANSIONS

PATH: \\MSPEC\SIS-FILES\GIS\PROJECTS\MINNPOWER\1025232017.2_WIP\MAP_DCS\DRIFT\AGENCY\DOC\J-1_HILLTOP_031414.XXD - USER: STUOHEY - DATE: 10/12/2021



LEGEND

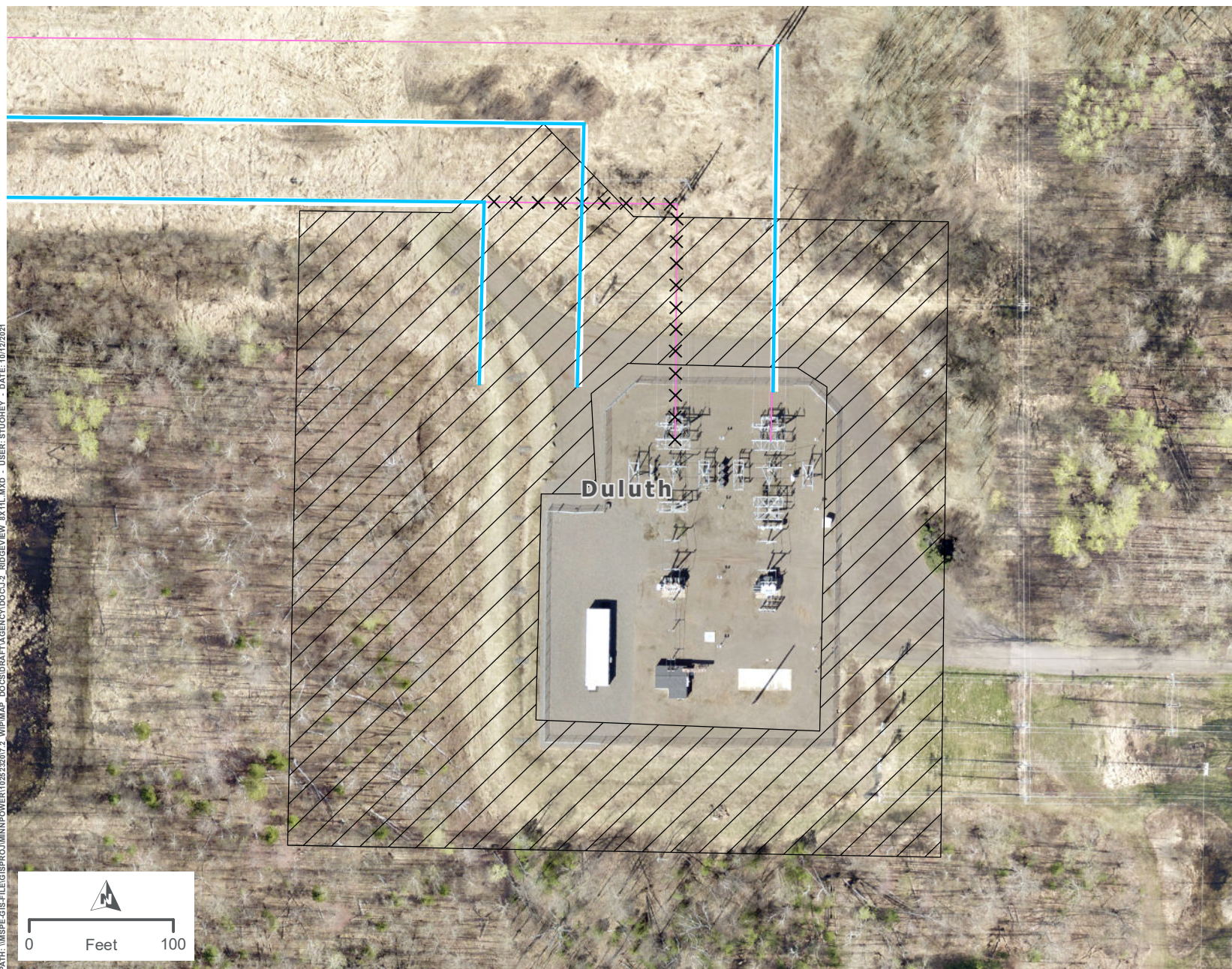
-  Substation Expansion Area
-  Project 115 kV Transmission Line (Single Circuit)
-  Project 230 kV Transmission Line (Single Circuit)
-  Removed Transmission Line (Realigned)
-  Existing Transmission Line







HILLTOP SUBSTATION EXPANSION DULUTH LOOP RELIABILITY PROJECT

APPENDIX J-1

PATH: \\MSPEC\GIS\FILES\PROJECTS\MINNPOWER\102522017.2_VIP\MAP DOCS\DRAFT\AGENCY\1000\J2 RIDGEVIEW AX1L.WXD - USER: STUDIOEY - DATE: 10/12/2021



LEGEND

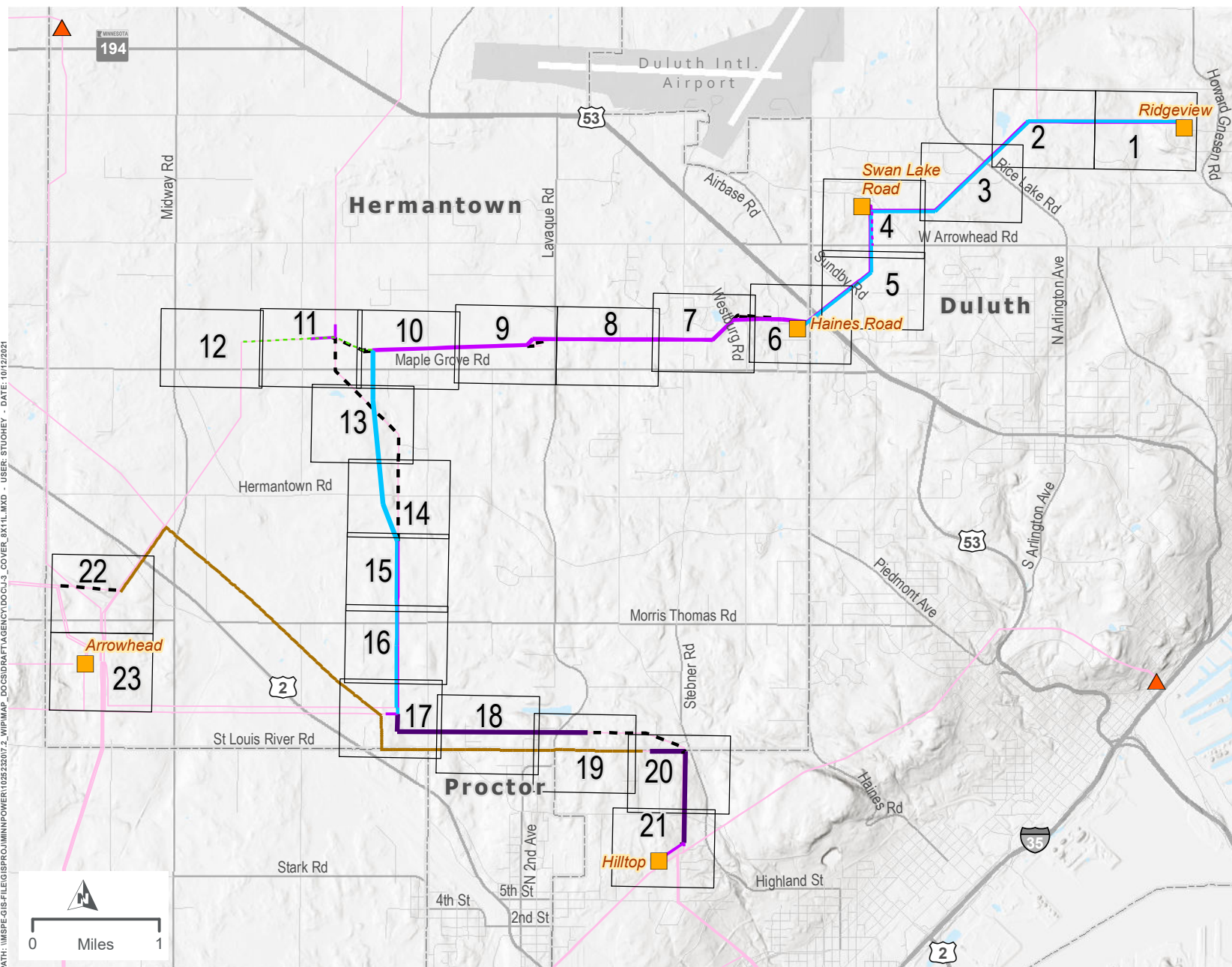
-  Substation Expansion Area
-  Project 115 kV Transmission Line (Single Circuit)
-  Removed Transmission Line (Realigned)
-  Existing Transmission Line



RIDGEVIEW SUBSTATION EXPANSION DULUTH LOOP RELIABILITY PROJECT

APPENDIX J-2

PATH: \\MSPE-GIS-FILES\GIS\PROJECTS\MINNPOWER\102532017_2_WIP\MAP - DOCS\DATA\AGENCY\DOCS\3_COVER_8X11.MXD - USER: STUONEY - DATE: 10/12/2021



LEGEND

- Map Page
- Project Substation
- Non-Project Substation
- Existing Transmission Line
- Rebuilt Distribution
- New Transmission Line
- Rebuilt Transmission Line (Single Circuit)
- Rebuilt Transmission Line (Double Circuit)
- Removed Transmission Line
- Thermal Upgrades
- Rebuilt Fiber
- Waterbody
- Airport
- City Boundary

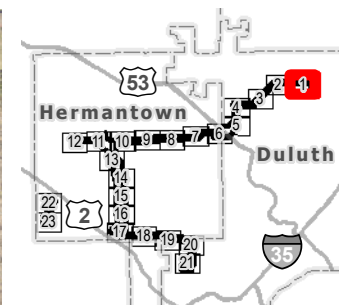
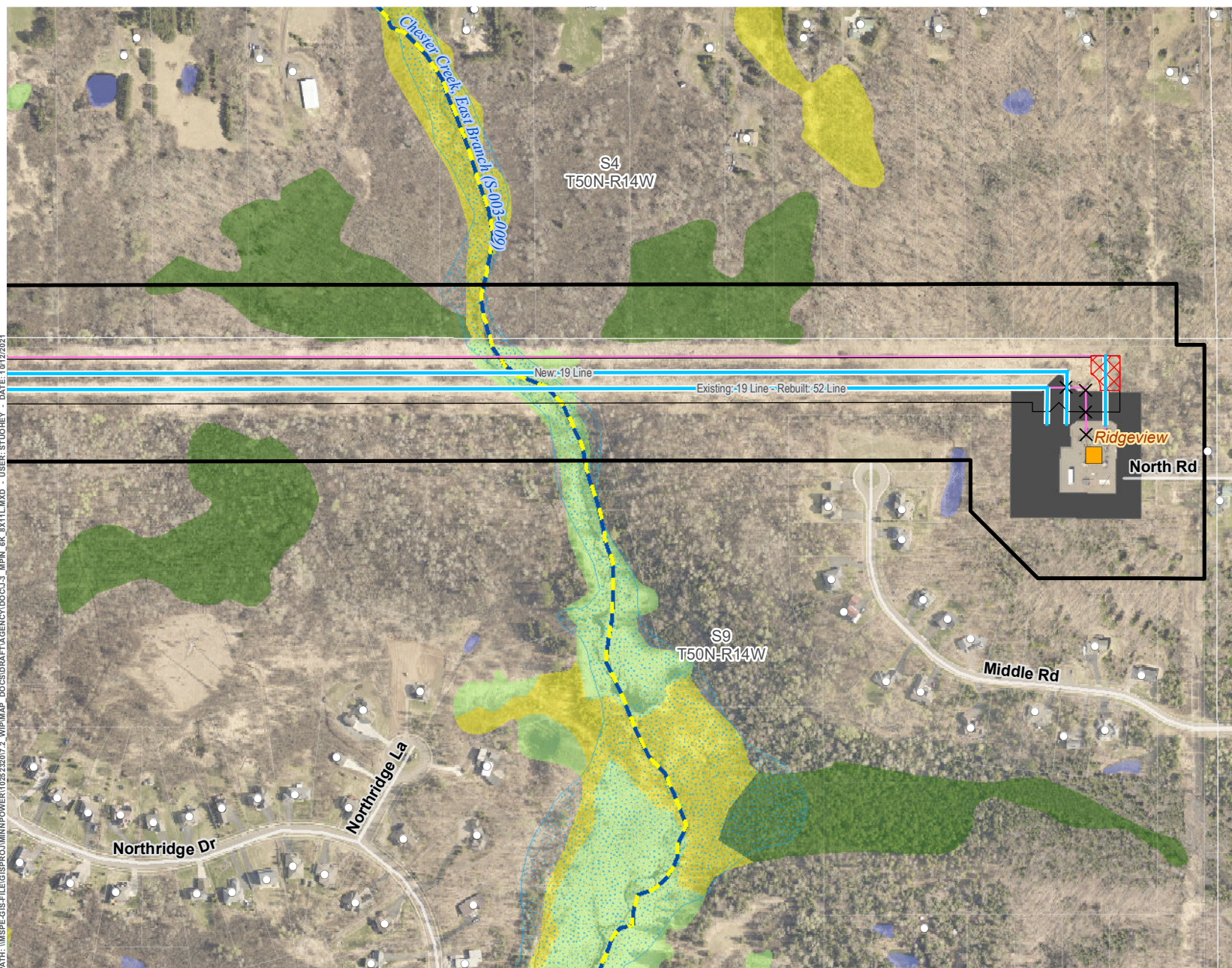


PROJECT DETAIL - INDEX

DULUTH LOOP RELIABILITY PROJECT

APPENDIX J-3

PATH: \\MSPE-GIS-FILES\GIS\PROJECTS\POWER\102523207.2_WPM\MAP DOCS\DRIFT\AGENCY\DOCS\J3_MPH_6K_0X11L.MXD - USER: STUOKEY - DATE: 10/12/2021



LEGEND

- Proposed Route
- Approximate ROW
- Approximate New Impact Area
- Project Substation
- Substation Expansion Area
- Project 115 kV Transmission Line (Single Circuit)
- Removed Transmission Line (Realigned)
- Existing Structure
- Existing Transmission Line
- Existing/Proposed Trail
- Designated Trout Stream
- PWI Watercourse
- FEMA Floodplain
- National Wetlands Inventory**
 - Freshwater Emergent Wetland
 - Freshwater Forested Wetland
 - Freshwater Shrub Wetland
 - Freshwater Pond; Lake; Riverine

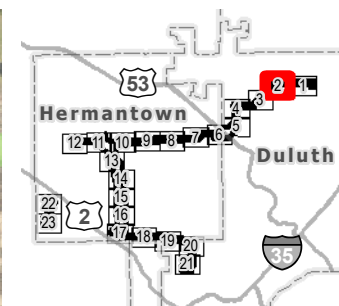
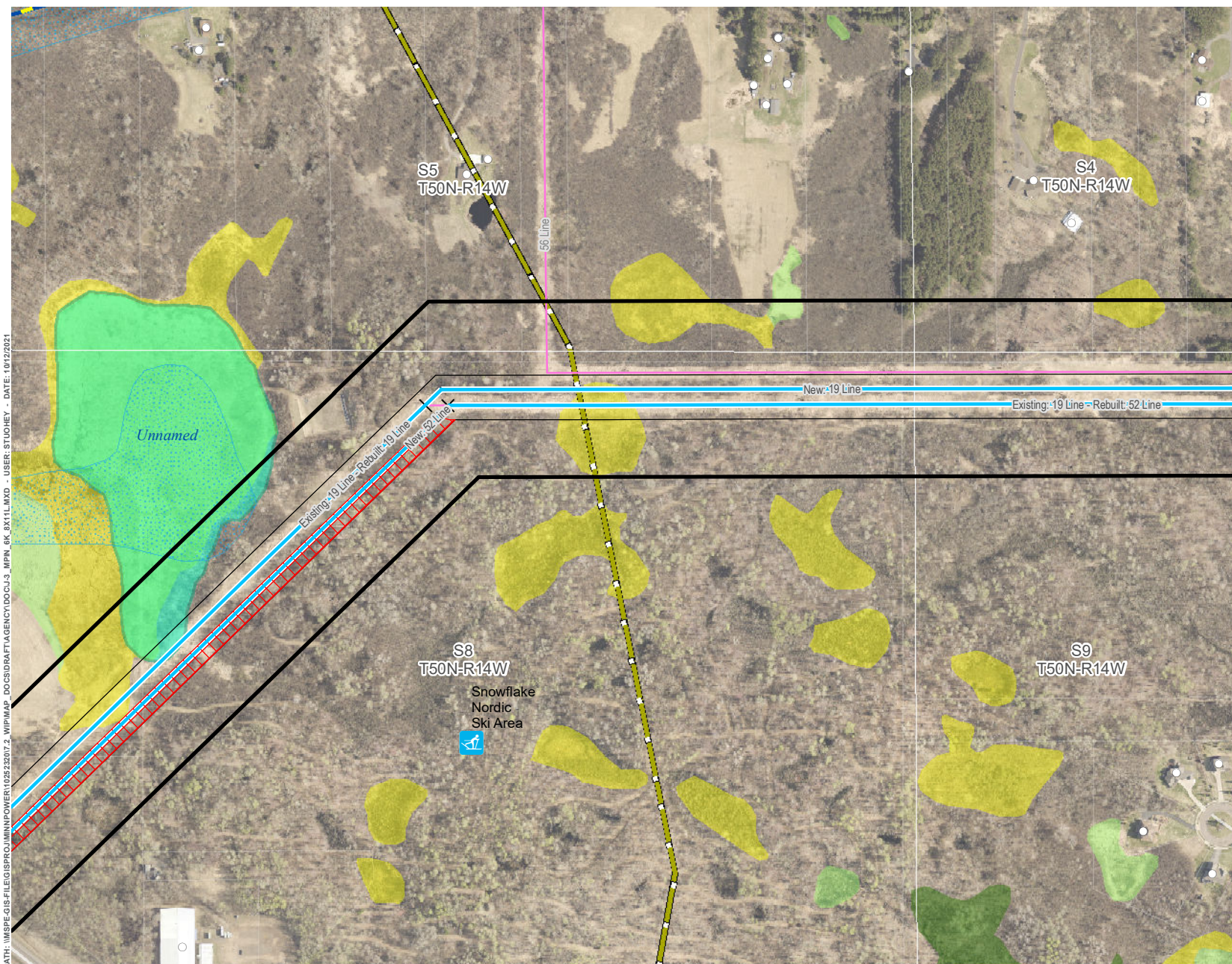
*Note: Removals shown for significant realignments only. Line removals associated with the reconstruction of transmission lines, including minor centerline shifts are not indicated for clarity purposes. See Proposed System Overview for further definition on final line configurations and designations.



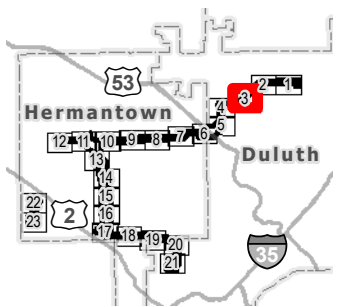
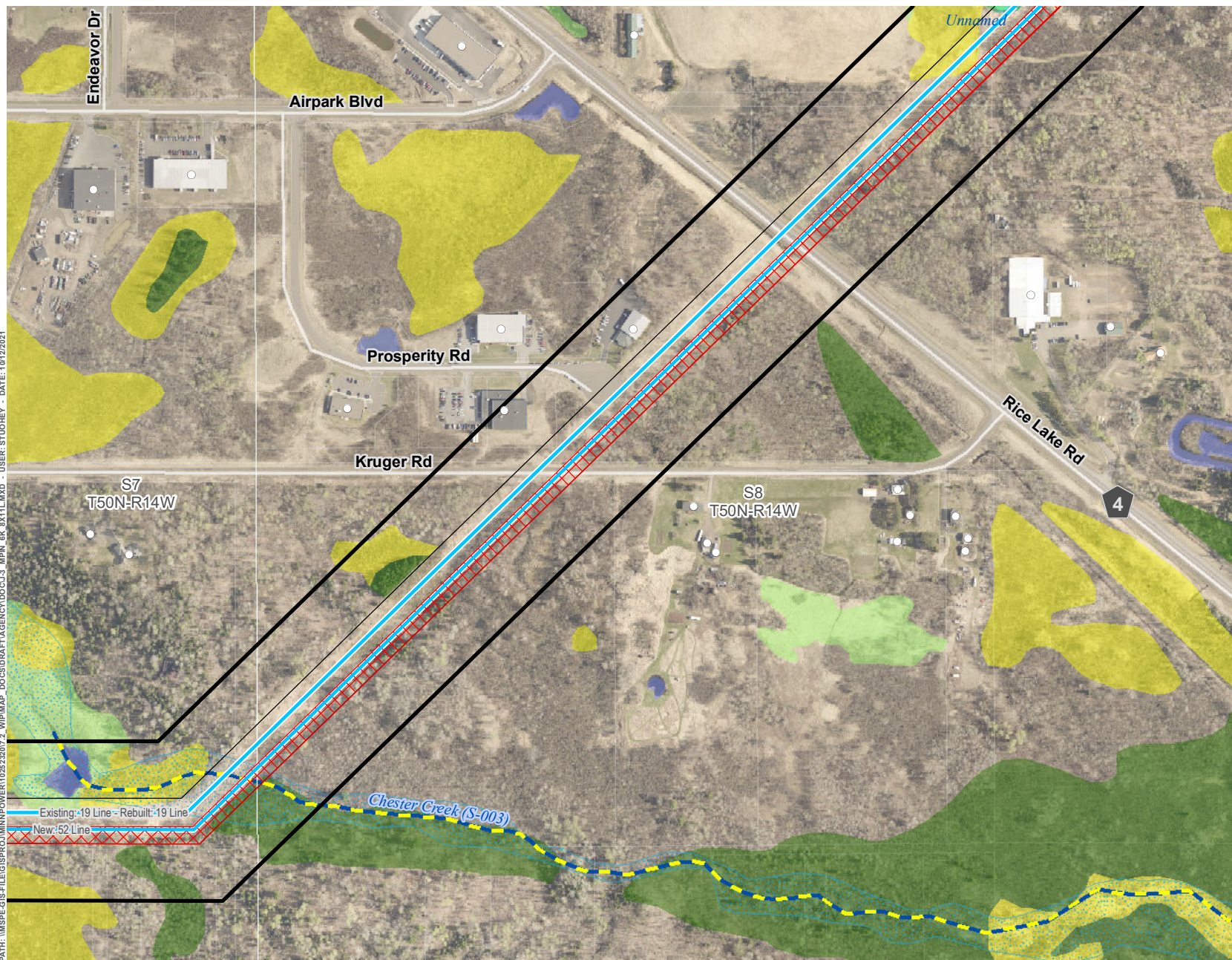
PROJECT DETAIL - SWAN LAKE ROAD TO RIDGEVIEW DULUTH LOOP RELIABILITY PROJECT

APPENDIX J-3: PAGE 1 OF 23





PATH: \\MSPEC-GIS-FILE\GIS\PROJECTS\POWER\10252207\2_WIP\MAP DOCS\DATA\AGENCY\DOCS\J3_MPH_6K_0X1\1.MXD - USER: STUOHEY - DATE: 10/12/2021



LEGEND

- Proposed Route
- Approximate ROW
- Approximate New Impact Area
- Project 115 kV Transmission Line (Single Circuit)
- Existing Structure
- Existing Transmission Line
- PWI Basin
- Existing/Proposed Trail
- Designated Trout Stream
- PWI Watercourse
- FEMA Floodplain
- National Wetlands Inventory**
 - Freshwater Emergent Wetland
 - Freshwater Forested Wetland
 - Freshwater Shrub Wetland
 - Freshwater Pond; Lake; Riverine

*Note: Removals shown for significant realignments only. Line removals associated with the reconstruction of transmission lines, including minor centerline shifts are not indicated for clarity purposes. See Proposed System Overview for further definition on final line configurations and designations.

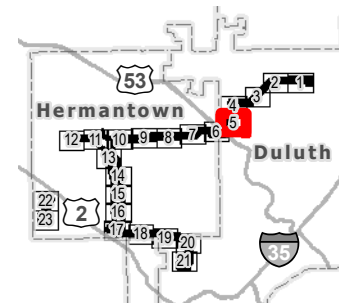
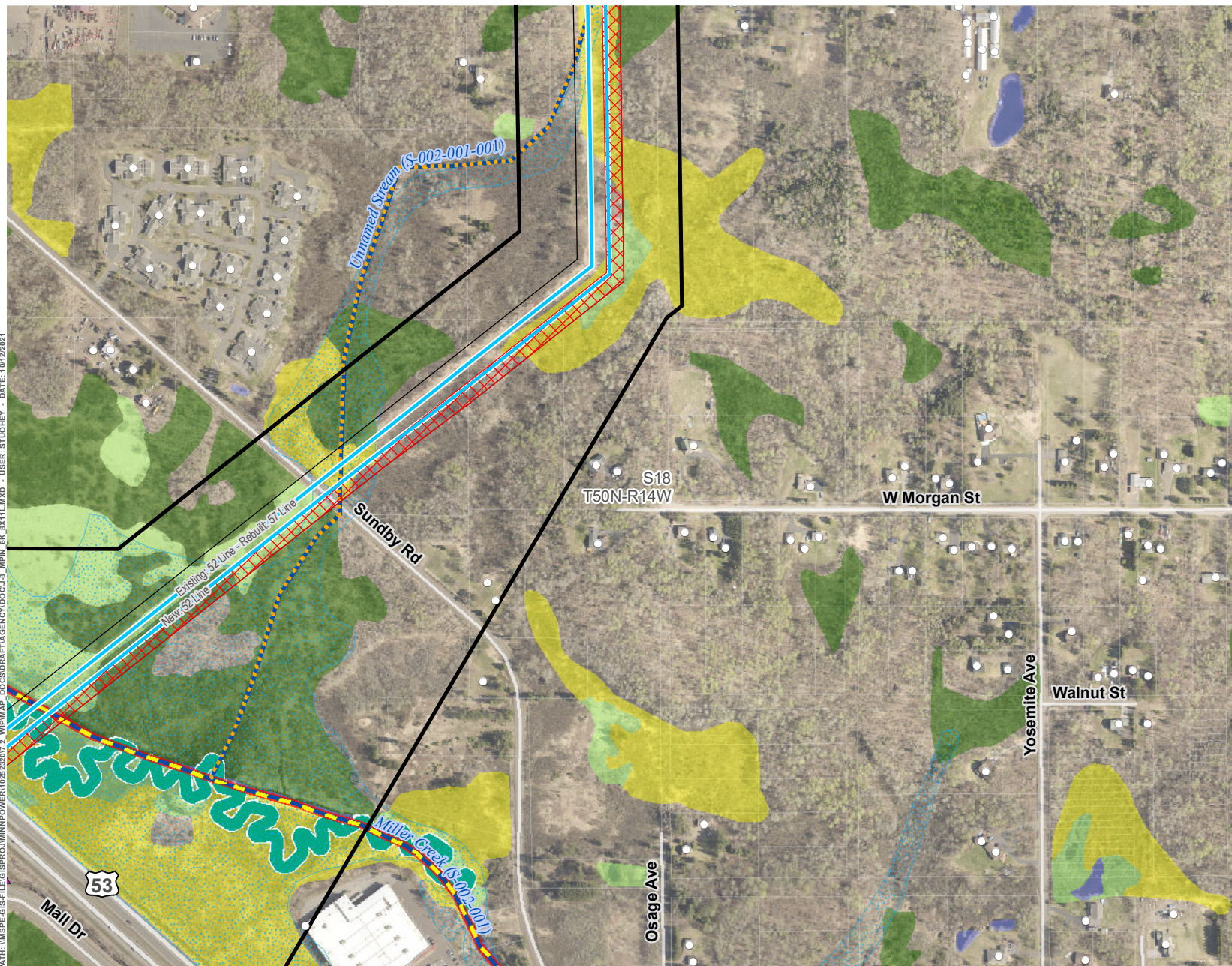


PROJECT DETAIL - SWAN LAKE ROAD TO RIDGEVIEW DULUTH LOOP RELIABILITY PROJECT

APPENDIX J-3: PAGE 3 OF 23



PATH: \\MSPEC\GIS\FILES\PROJECTS\MINNPOWER\10252307\2_WPM\MAP_DCS\DRIFT\AGENCY\DOC\J_3_MPH_6K_0X1\1.MXD - USER: STUOHNEY - DATE: 10/12/2021



LEGEND

- Proposed Route
- Approximate ROW
- Approximate New Impact Area
- Project 115 kV Transmission Line (Single Circuit)
- Existing Structure
- Existing Transmission Line
- Existing/Proposed Trail
- Impaired Water
- Designated Trout Stream
- Protected Tributary to Designated Trout Stream
- Unmapped Tributary
- PWI Watercourse
- Miller Creek Meander
- FEMA Floodplain
- National Wetlands Inventory**
 - Freshwater Emergent Wetland
 - Freshwater Forested Wetland
 - Freshwater Shrub Wetland
 - Freshwater Pond; Lake; Riverine

*Note: Removals shown for significant realignments only. Line removals associated with the reconstruction of transmission lines, including minor centerline shifts are not indicated for clarity purposes. See Proposed System Overview for further definition on final line configurations and designations.

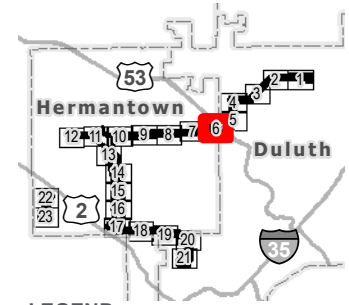
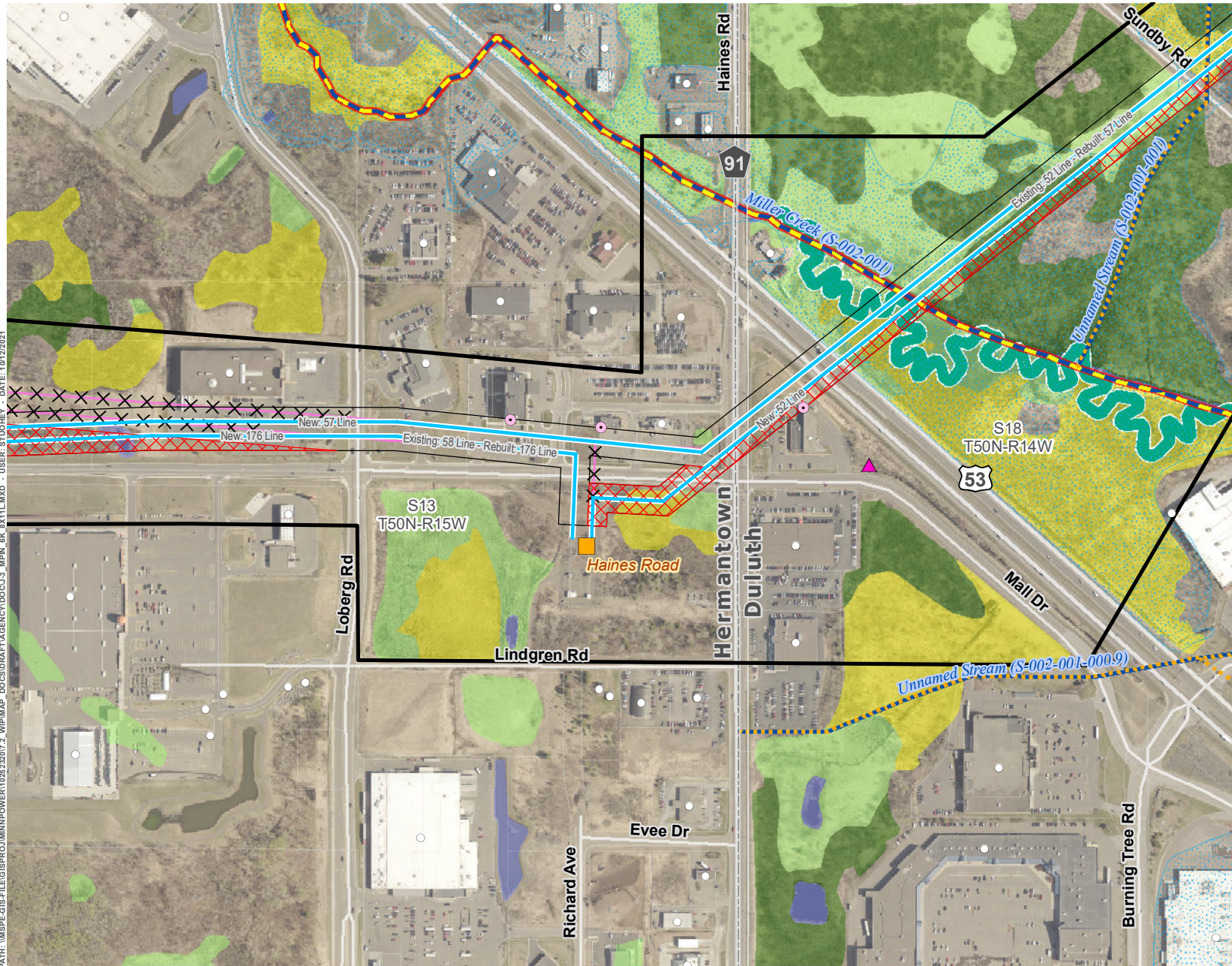


PROJECT DETAIL - HAINES ROAD TO SWAN LAKE ROAD DULUTH LOOP RELIABILITY PROJECT

APPENDIX J-3: PAGE 5 OF 23



PATH: \\MSPE-GIS-FILES\GIS\PROJECTS\HILLTOP TO HAINES ROAD - USER: STUDY - DATE: 10/12/2021



LEGEND

- Proposed Route
- Approximate ROW
- Approximate New Impact Area
- Project Substation
- Project 115 kV Transmission Line (Single Circuit)
- Removed Transmission Line (Realigned)
- Existing Structure
- Structure in ROW
- Existing Transmission Line
- Existing/Proposed Trail
- Impaired Water
- Designated Trout Stream
- Protected Tributary to Designated Trout Stream
- Unmapped Tributary
- PWI Watercourse
- Miller Creek Meander
- FEMA Floodplain
- National Wetlands Inventory**
 - Freshwater Emergent Wetland
 - Freshwater Forested Wetland
 - Freshwater Shrub Wetland
 - Freshwater Pond; Lake; Riverine

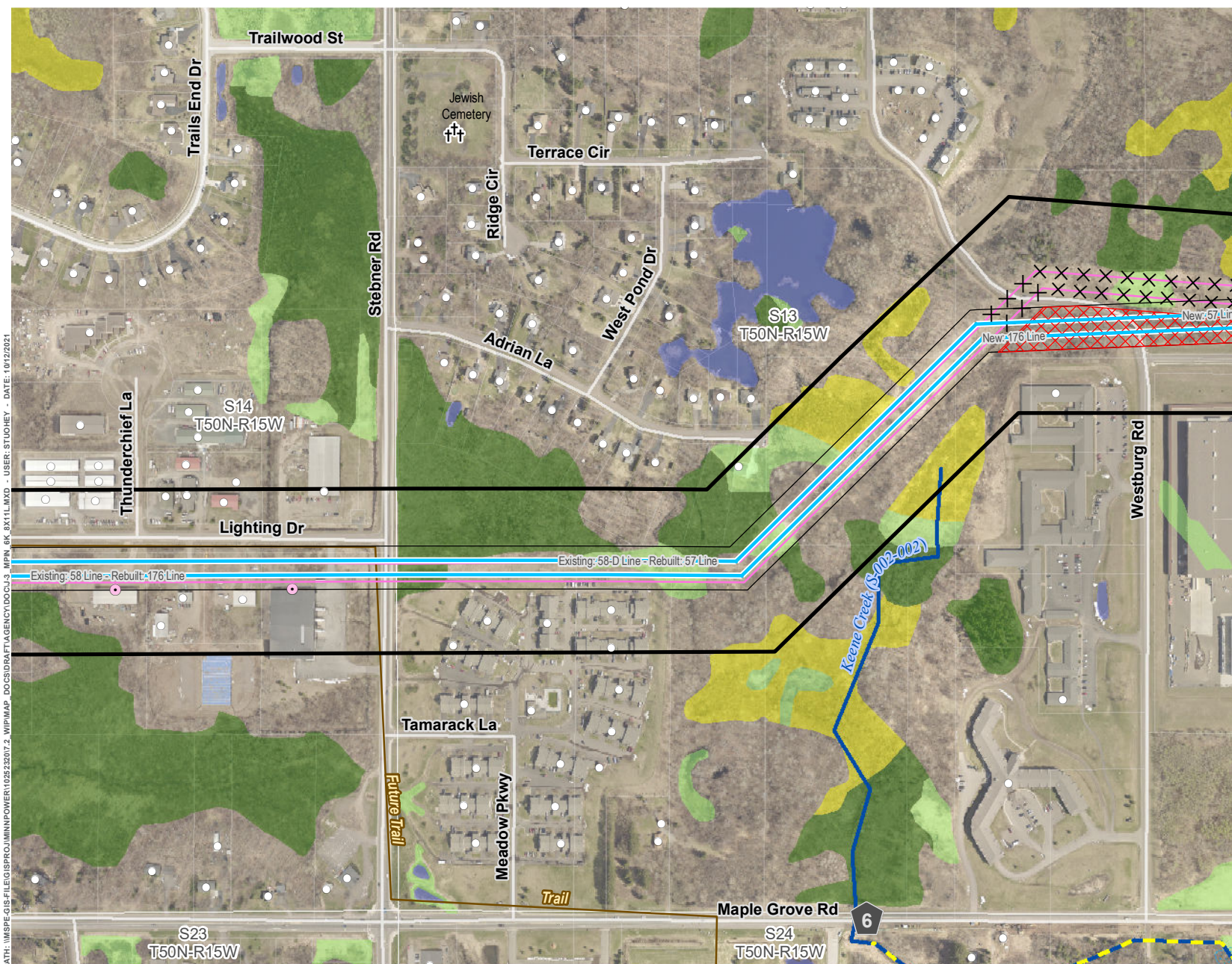
*Note: Removals shown for significant realignments only. Line removals associated with the reconstruction of transmission lines, including minor centerline shifts are not indicated for clarity purposes. See Proposed System Overview for further definition on final line configurations and designations.



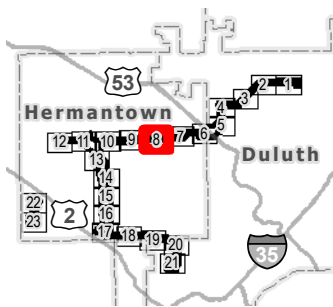
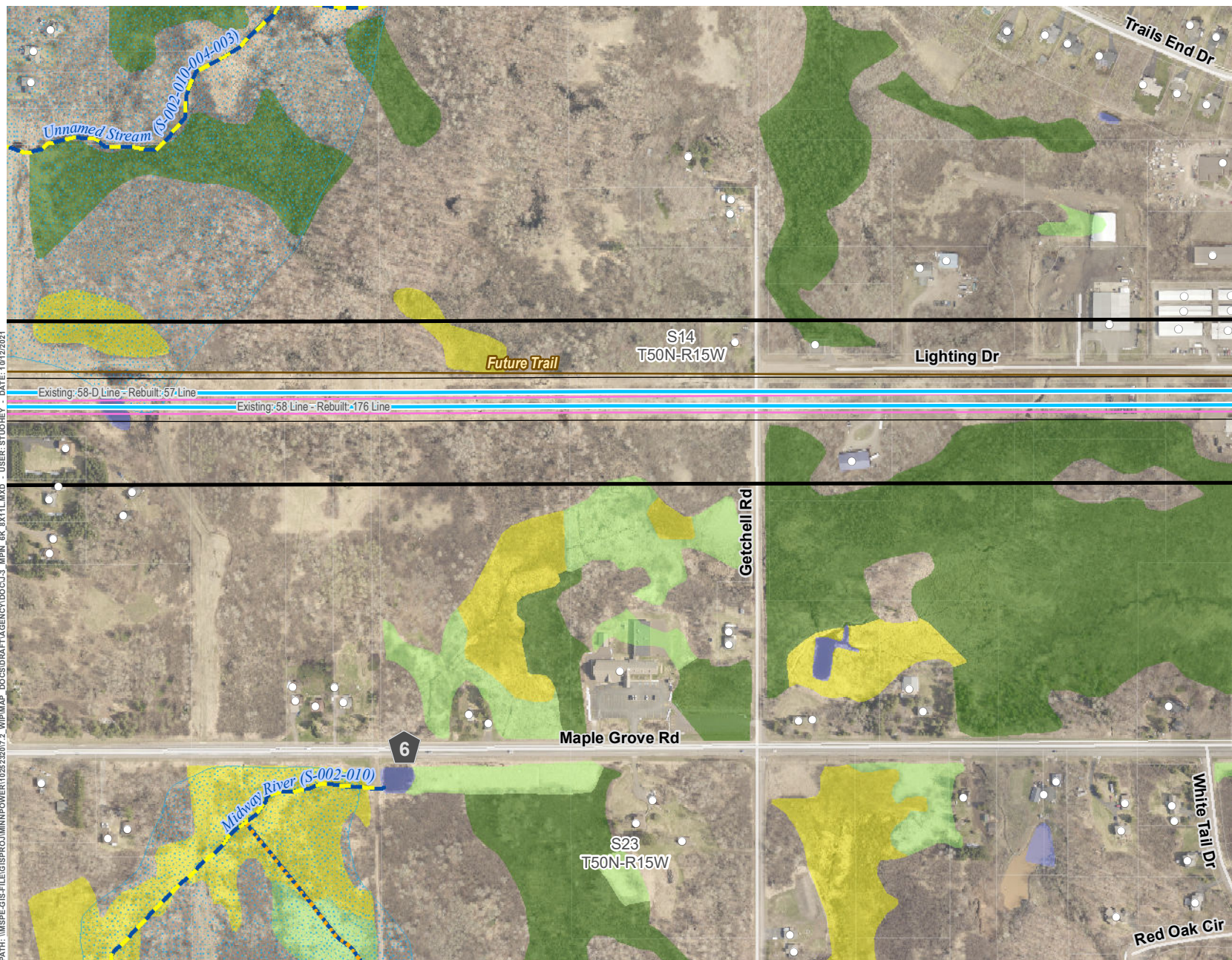
PROJECT DETAIL - HILLTOP TO HAINES ROAD DULUTH LOOP RELIABILITY PROJECT

APPENDIX J-3: PAGE 6 OF 23





PATH: \\MSPE-GIS-FILE\GIS\PROJECTS\POWER\102523207_2_WPM\MAP DOCS\DATA\AGENCY\DOC\J_3_MPH_6K_0X1L\MXD - USER: STUOEY - DATE: 10/12/2021



- LEGEND**
- Proposed Route
 - Approximate ROW
 - Project 115 kV Transmission Line (Single Circuit)
 - Existing Structure
 - Existing Transmission Line
 - Existing/Proposed Trail
 - Designated Trout Stream
 - Protected Tributary to Designated Trout Stream
 - PWI Watercourse
 - FEMA Floodplain
 - National Wetlands Inventory**
 - Freshwater Emergent Wetland
 - Freshwater Forested Wetland
 - Freshwater Shrub Wetland
 - Freshwater Pond; Lake; Riverine

*Note: Removals shown for significant realignments only. Line removals associated with the reconstruction of transmission lines, including minor centerline shifts are not indicated for clarity purposes. See Proposed System Overview for further definition on final line configurations and designations.

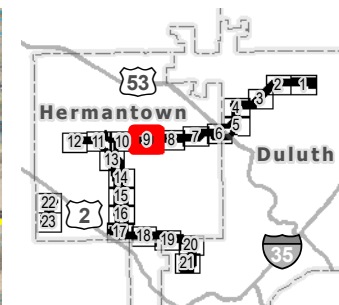
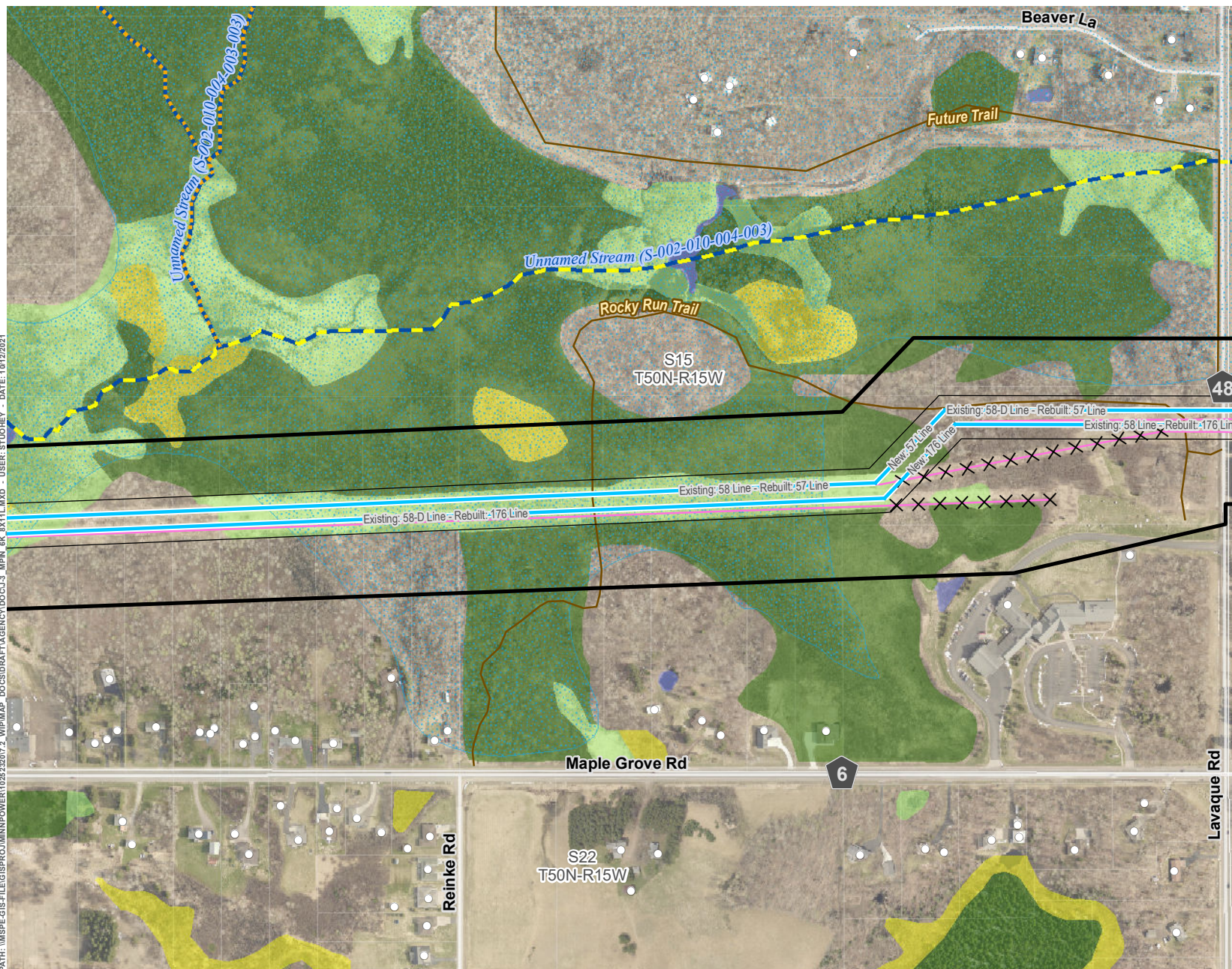


PROJECT DETAIL - HILLTOP TO HAINES ROAD
DULUTH LOOP RELIABILITY PROJECT

APPENDIX J-3: PAGE 8 OF 23



PATH: \\MSPE-GIS-FILE\GIS\PROJECTS\HILLTOP TO HAINES ROAD - USER: STUDNEY - DATE: 10/12/2021



LEGEND

- Proposed Route
- Approximate ROW
- Project 115 kV Transmission Line (Single Circuit)
- Removed Transmission Line (Realigned)
- Existing Structure
- Existing Transmission Line
- Existing/Proposed Trail
- Designated Trout Stream
- Protected Tributary to Designated Trout Stream
- PWI Watercourse
- FEMA Floodplain
- National Wetlands Inventory**
 - Freshwater Emergent Wetland
 - Freshwater Forested Wetland
 - Freshwater Shrub Wetland
 - Freshwater Pond; Lake; Riverine

*Note: Removals shown for significant realignments only. Line removals associated with the reconstruction of transmission lines, including minor centerline shifts are not indicated for clarity purposes. See Proposed System Overview for further definition on final line configurations and designations.

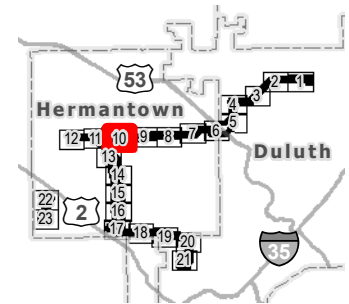
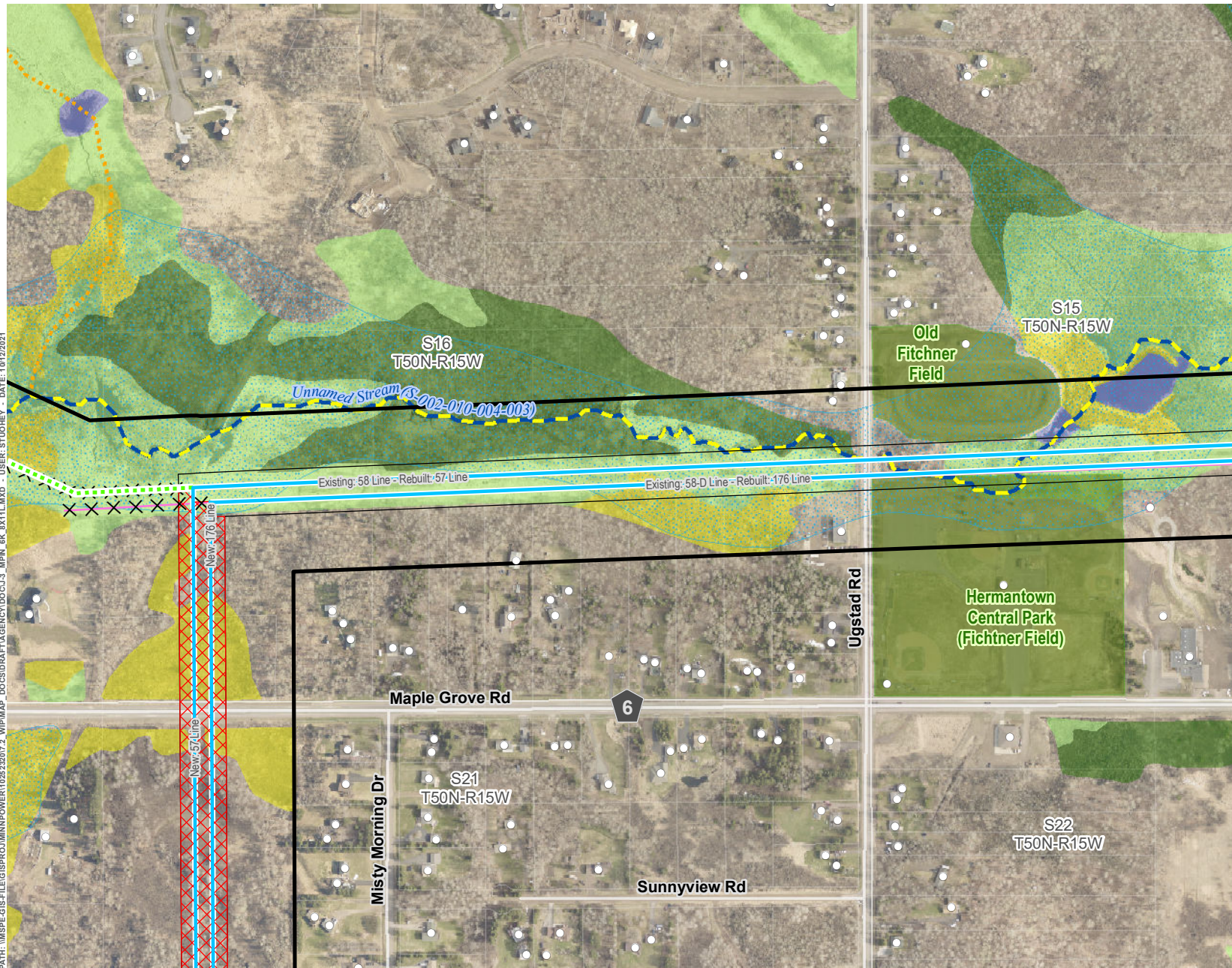


PROJECT DETAIL - HILLTOP TO HAINES ROAD DULUTH LOOP RELIABILITY PROJECT

APPENDIX J-3: PAGE 9 OF 23



PATH: \\MSPE-GIS-FILES\GIS\PROJECTS\10252207\2_WPMAP\DOCS\DATA\AGENCY\DOCS\J_2_WPMAP_6K_0X11L.MXD - USER: STUONEY - DATE: 10/12/2021



- LEGEND**
- Proposed Route
 - Approximate ROW
 - Approximate New Impact Area
 - Project 115 kV Transmission Line (Single Circuit)
 - Removed Transmission Line (Realigned)
 - New Underground Fiber
 - Existing Structure
 - Existing Transmission Line
 - Existing/Proposed Trail
 - Designated Trout Stream
 - Protected Tributary to Designated Trout Stream
 - PWI Watercourse
 - FEMA Floodplain
 - Park
 - National Wetlands Inventory**
 - Freshwater Emergent Wetland
 - Freshwater Forested Wetland
 - Freshwater Shrub Wetland
 - Freshwater Pond; Lake; Riverine

*Note: Removals shown for significant realignments only. Line removals associated with the reconstruction of transmission lines, including minor centerline shifts are not indicated for clarity purposes. See Proposed System Overview for further definition on final line configurations and designations.



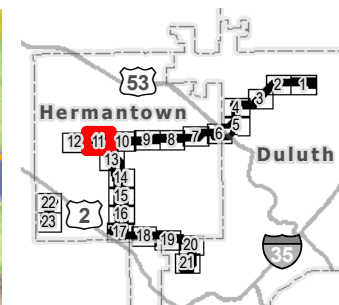
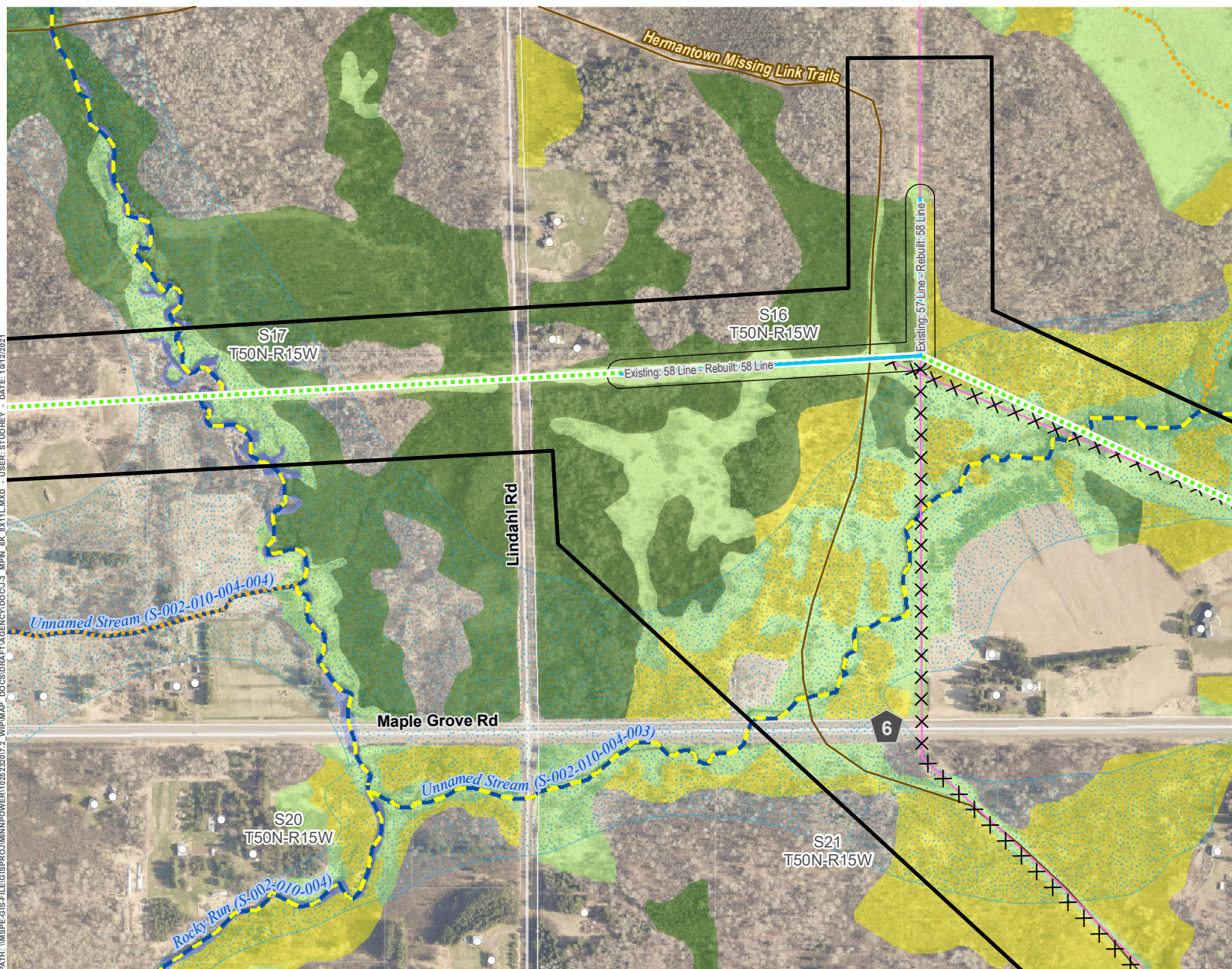
PROJECT DETAIL - HILLTOP TO HAINES ROAD

DULUTH LOOP RELIABILITY PROJECT

APPENDIX J-3: PAGE 10 OF 23



PATH: \\MSPE-GIS-FILE\GIS\PROJECT\POWER\102532017_2_WPMAP - DOCS\DATA\AGENCY\DOCS\J_MPH_6K_0X1-LMXD - USER: STUDIOEY - DATE: 10/12/2021



LEGEND

- Proposed Route
- Approximate ROW
- Project 115 kV Transmission Line (Single Circuit)
- X X Removed Transmission Line (Realigned)
- New Underground Fiber
- o Existing Structure
- Existing Transmission Line
- Existing/Proposed Trail
- Designated Trout Stream
- Protected Tributary to Designated Trout Stream
- PWI Watercourse
- FEMA Floodplain

National Wetlands Inventory

- Freshwater Emergent Wetland
- Freshwater Forested Wetland
- Freshwater Shrub Wetland
- Freshwater Pond; Lake; Riverine

*Note: Removals shown for significant realignments only. Line removals associated with the reconstruction of transmission lines, including minor centerline shifts are not indicated for clarity purposes. See Proposed System Overview for further definition on final line configurations and designations.

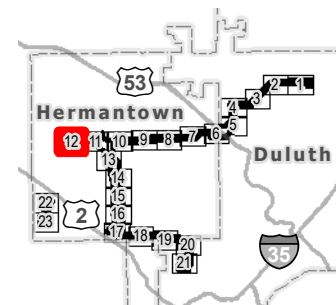
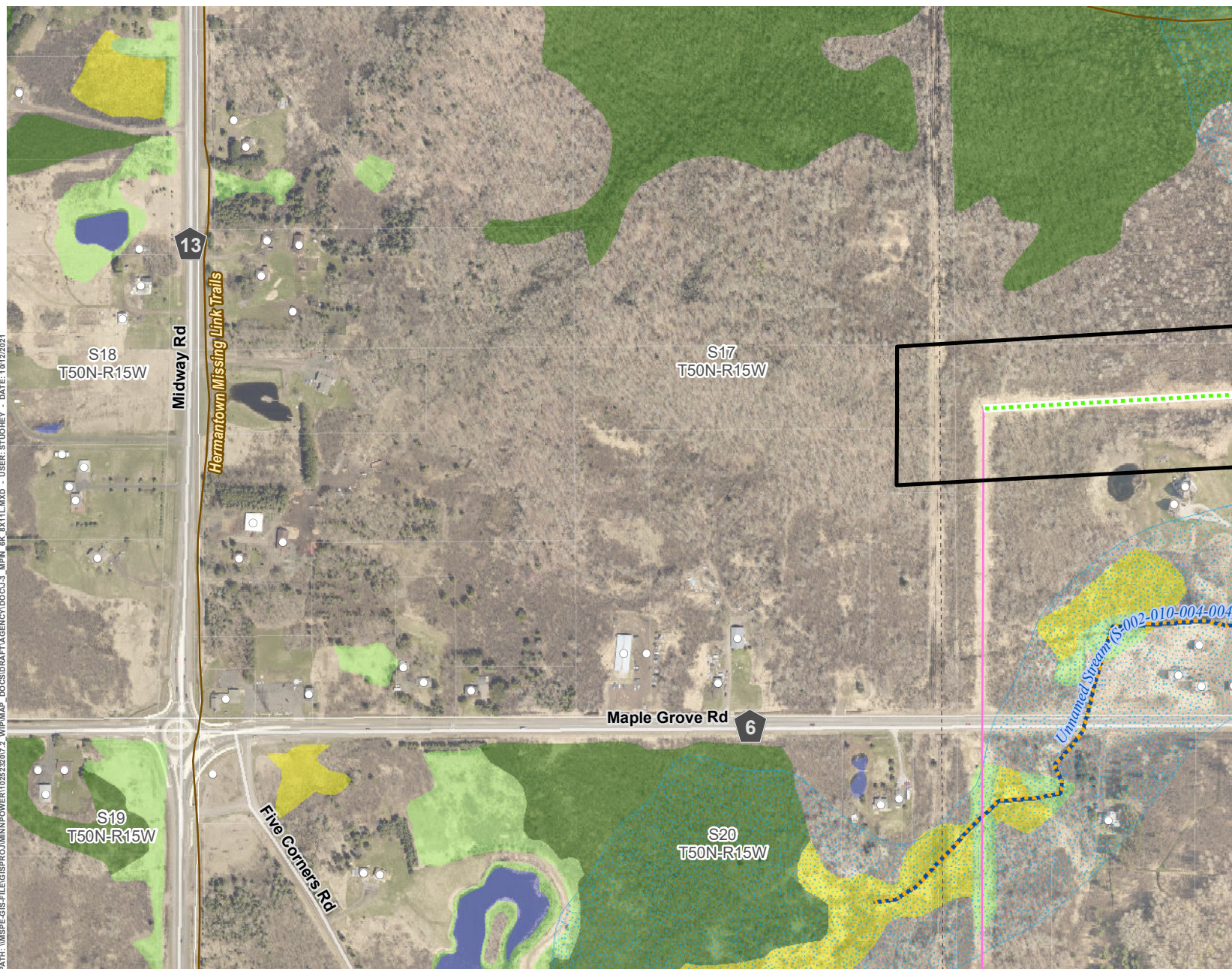


PROJECT DETAIL - FIBER DULUTH LOOP RELIABILITY PROJECT

APPENDIX J-3: PAGE 11 OF 23



PATH: \\MSPE-GIS-FILE\GIS\PROJECTS\MINNPOWER\102522017_2_WIP\MAP DOCS\DATA\AGENCY\DOC\J_3_MPH_6K_0X1L.MXD - USER: STUOHEY - DATE: 10/12/2021



LEGEND

- Proposed Route
- New Underground Fiber
- Existing Structure
- Existing Transmission Line
- Existing Pipeline
- Existing/Proposed Trail
- Designated Trout Stream
- Protected Tributary to Designated Trout Stream
- PWI Watercourse
- FEMA Floodplain
- National Wetlands Inventory**
 - Freshwater Emergent Wetland
 - Freshwater Forested Wetland
 - Freshwater Shrub Wetland
 - Freshwater Pond; Lake; Riverine

*Note: Removals shown for significant realignments only. Line removals associated with the reconstruction of transmission lines, including minor centerline shifts are not indicated for clarity purposes. See Proposed System Overview for further definition on final line configurations and designations.

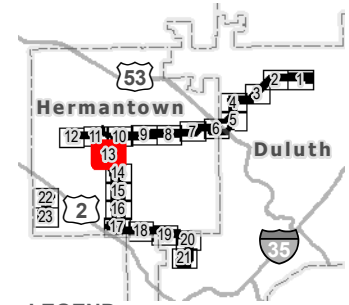
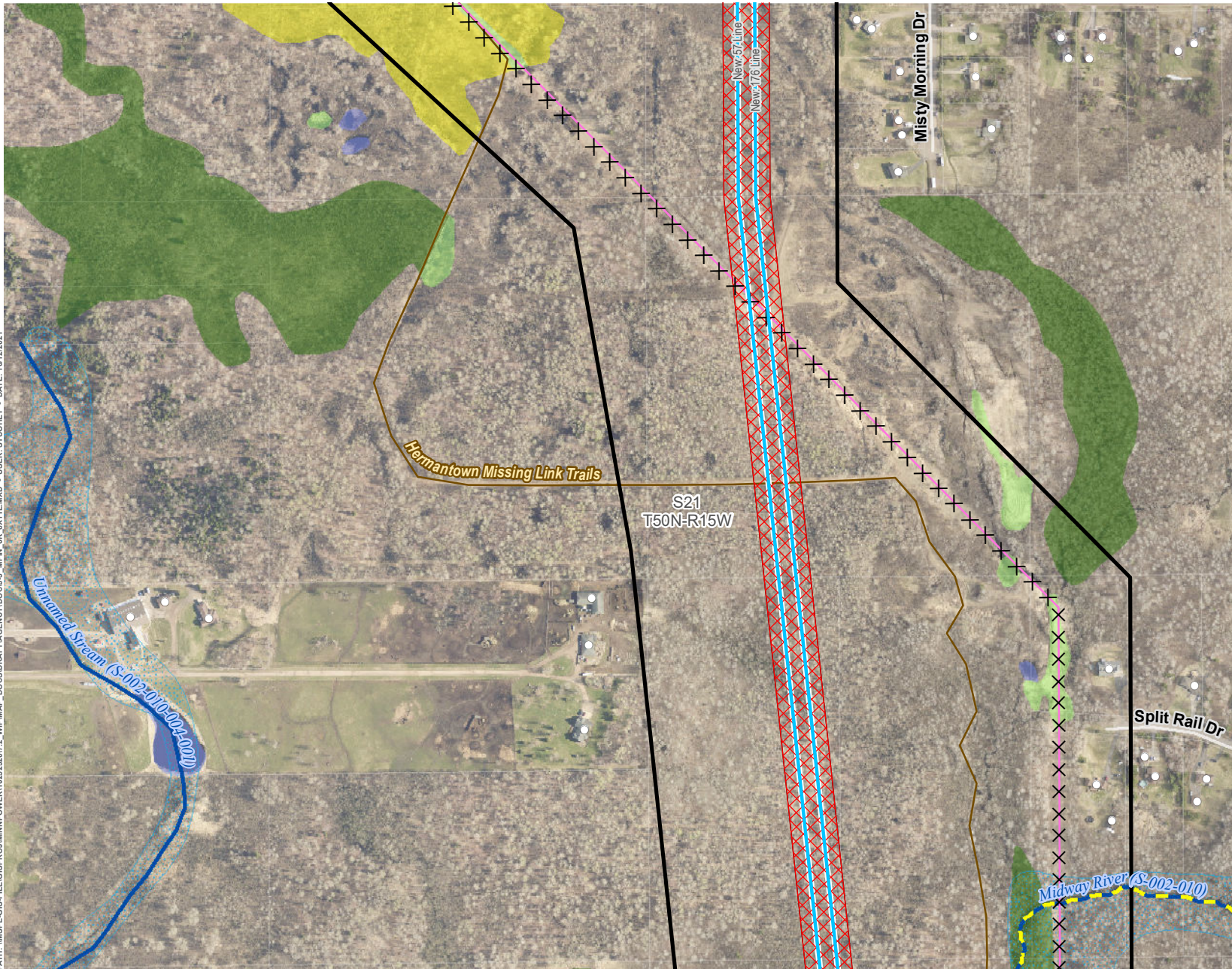


PROJECT DETAIL - FIBER DULUTH LOOP RELIABILITY PROJECT

APPENDIX J-3: PAGE 12 OF 23



PATH: \\MSPE-GIS-FILE\GIS\PROJECTS\MINNPOWER\10252207\2_WPM\MAP DOCS\DATA\AGENCY\DOC\J_3_MPH_6K_0X1L.MXD - USER: STUOHEY - DATE: 10/12/2021



LEGEND

- Proposed Route
- Approximate ROW
- Approximate New Impact Area
- Project 115 kV Transmission Line (Single Circuit)
- Removed Transmission Line (Realignments)
- Existing Structure
- Existing Transmission Line
- Existing/Proposed Trail
- Designated Trout Stream
- PWI Watercourse
- FEMA Floodplain
- National Wetlands Inventory**
 - Freshwater Emergent Wetland
 - Freshwater Forested Wetland
 - Freshwater Shrub Wetland
 - Freshwater Pond; Lake; Riverine

*Note: Removals shown for significant realignments only. Line removals associated with the reconstruction of transmission lines, including minor centerline shifts are not indicated for clarity purposes. See Proposed System Overview for further definition on final line configurations and designations.

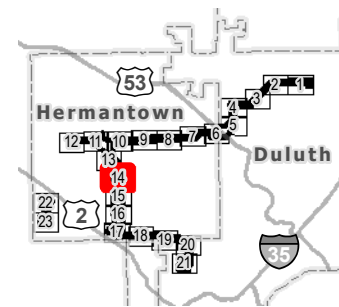
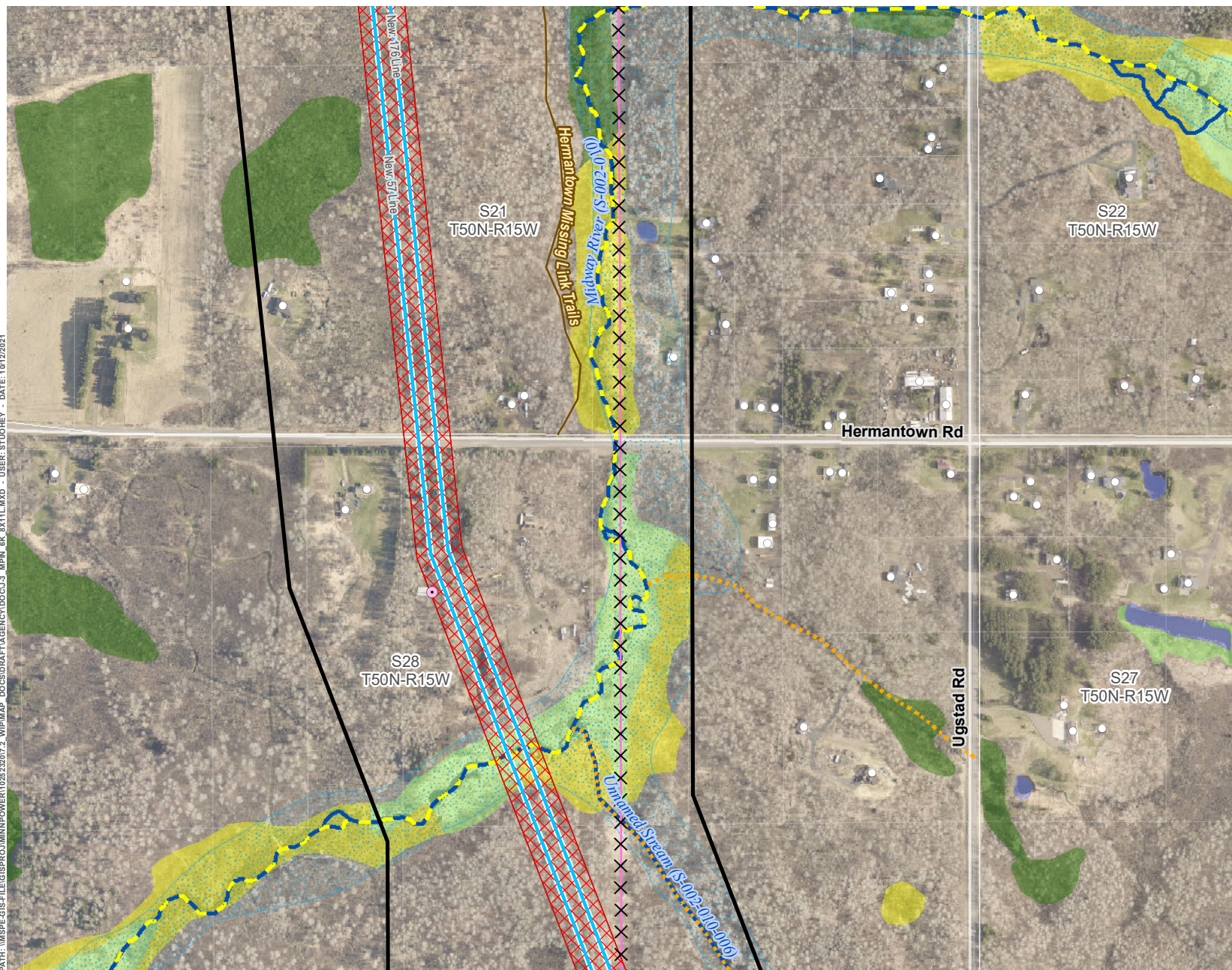


PROJECT DETAIL - HILLTOP TO HAINES ROAD DULUTH LOOP RELIABILITY PROJECT

APPENDIX J-3: PAGE 13 OF 23



PATH: \\MSPEC\GIS\PROJECTS\MINNPOWER\10252287\2_WIP\MAP DOCS\DATA\AGENCY\DOC\J3_WIP\MAP 6K 0X11.MXD - USER: STUONEY - DATE: 10/12/2021



- LEGEND**
- Proposed Route
 - Approximate ROW
 - Approximate New Impact Area
 - Project 115 kV Transmission Line (Single Circuit)
 - Removed Transmission Line (Realigned)
 - Existing Structure
 - Structure in ROW
 - Existing Transmission Line
 - Existing/Proposed Trail
 - Designated Trout Stream
 - Protected Tributary to Designated Trout Stream
 - PWI Watercourse
 - FEMA Floodplain
 - National Wetlands Inventory**
 - Freshwater Emergent Wetland
 - Freshwater Forested Wetland
 - Freshwater Shrub Wetland
 - Freshwater Pond; Lake; Riverine

*Note: Removals shown for significant realignments only. Line removals associated with the reconstruction of transmission lines, including minor centerline shifts are not indicated for clarity purposes. See Proposed System Overview for further definition on final line configurations and designations.

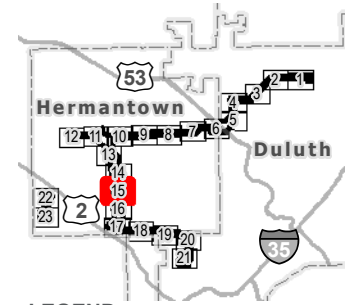
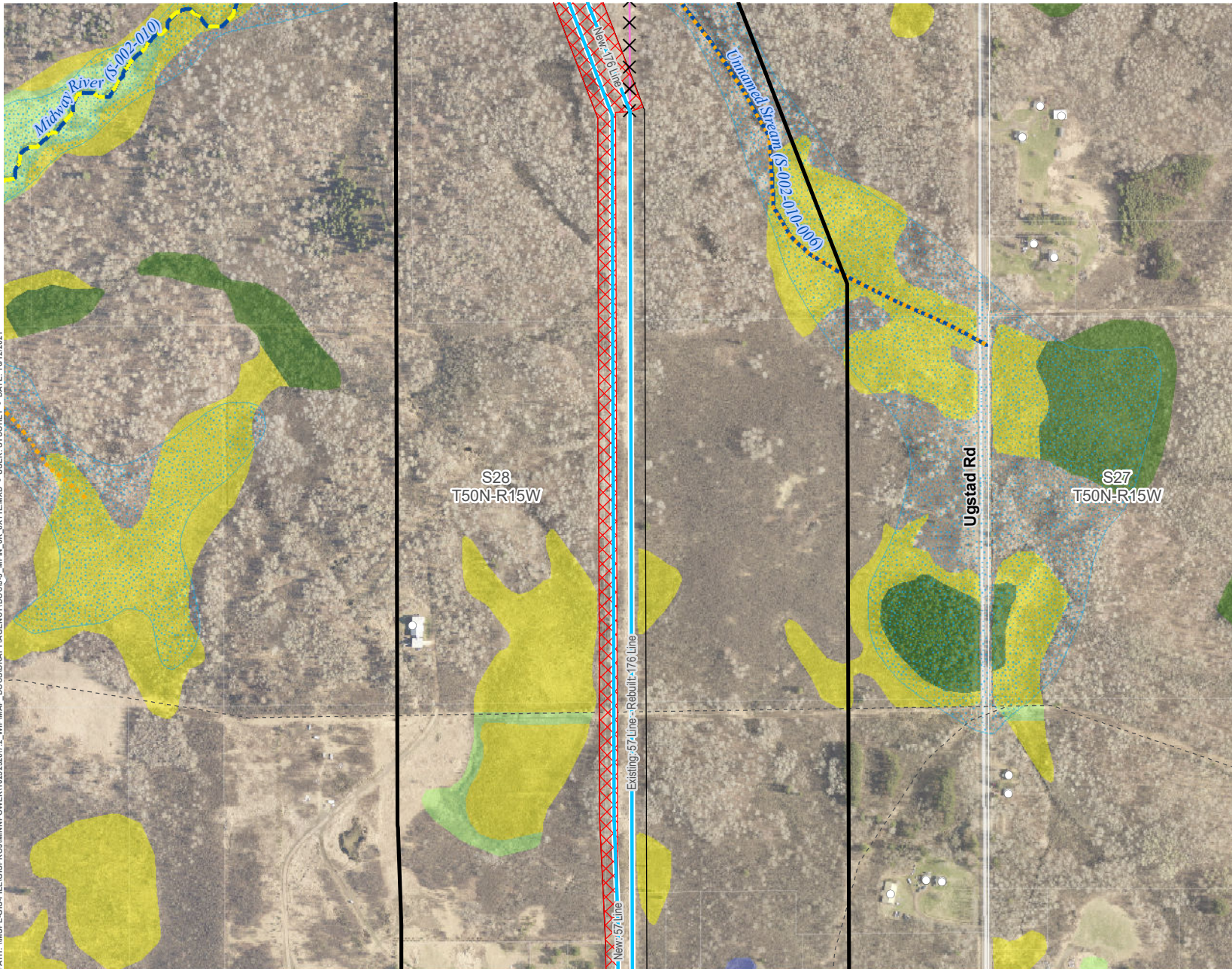


PROJECT DETAIL - HILLTOP TO HAINES ROAD DULUTH LOOP RELIABILITY PROJECT

APPENDIX J-3: PAGE 14 OF 23



PATH: \\MSPE-GIS-FILES\GIS\PROJECTS\MINNPOWER\102522017.2_WIP\MAP DOCS\DATA\AGENCY\DOC\J.3_MPH_6K_0X1L.MXD - USER: STUOHLEY - DATE: 10/12/2021



LEGEND

- Proposed Route
- Approximate ROW
- Approximate New Impact Area
- Project 115 kV Transmission Line (Single Circuit)
- Removed Transmission Line (Realigned)
- Existing Structure
- Existing Transmission Line
- Existing Pipeline
- Existing/Proposed Trail
- Designated Trout Stream
- Protected Tributary to Designated Trout Stream
- PWI Watercourse
- FEMA Floodplain
- National Wetlands Inventory**
 - Freshwater Emergent Wetland
 - Freshwater Forested Wetland
 - Freshwater Shrub Wetland
 - Freshwater Pond; Lake; Riverine

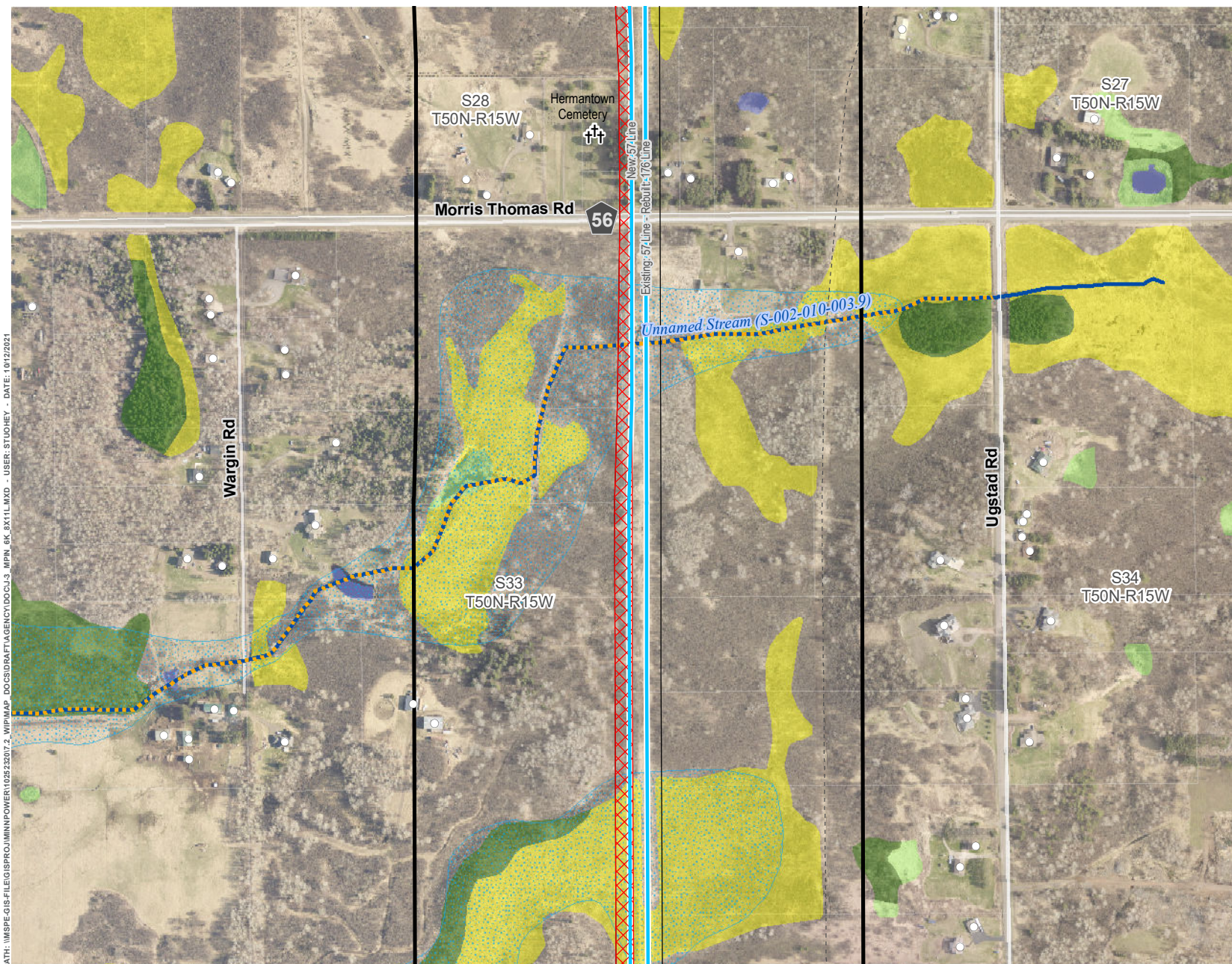
*Note: Removals shown for significant realignments only. Line removals associated with the reconstruction of transmission lines, including minor centerline shifts are not indicated for clarity purposes. See Proposed System Overview for further definition on final line configurations and designations.

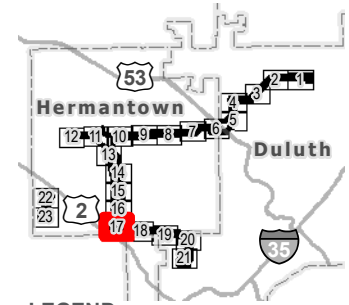
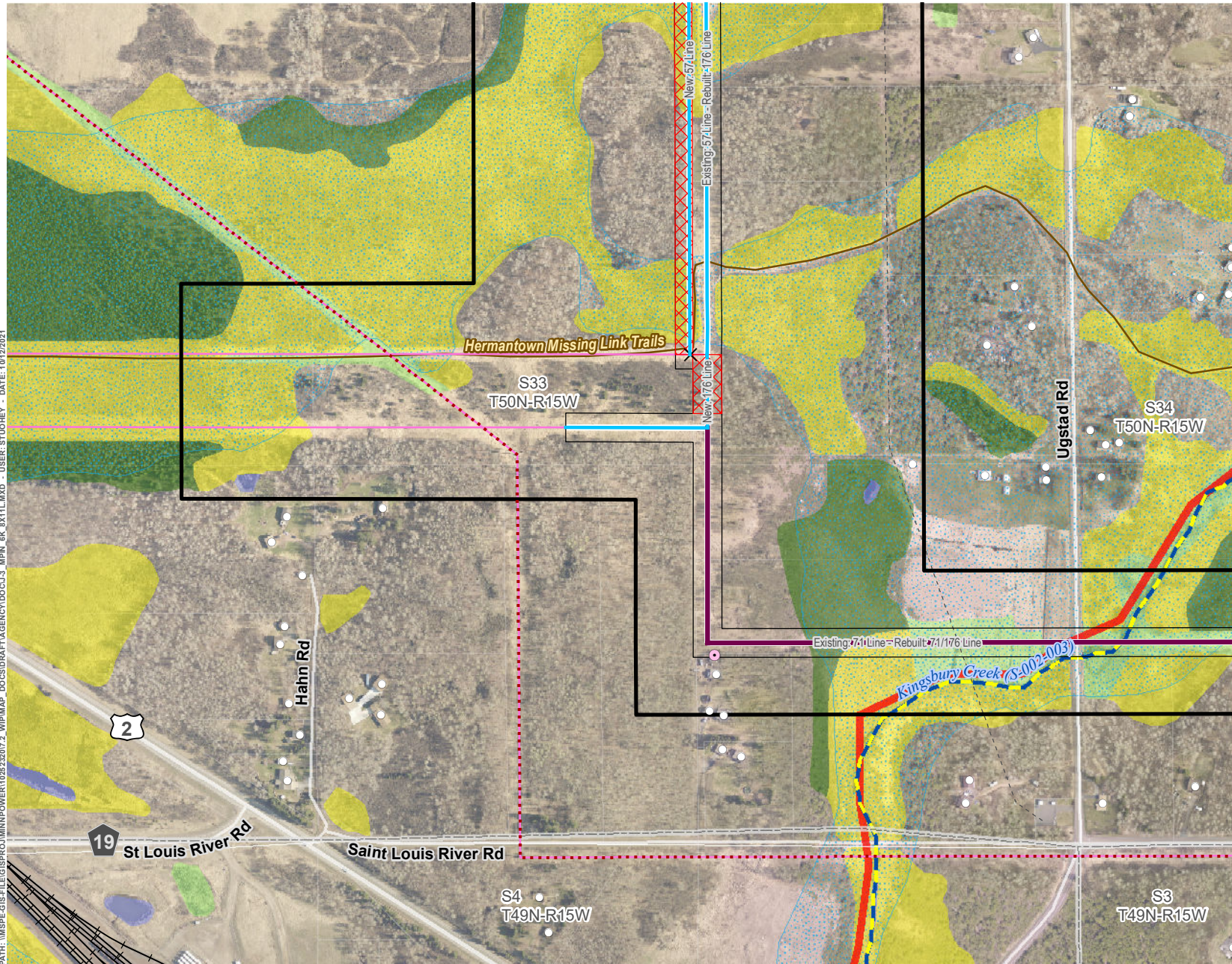


PROJECT DETAIL - HILLTOP TO HAINES ROAD DULUTH LOOP RELIABILITY PROJECT

APPENDIX J-3: PAGE 15 OF 23







LEGEND

- Proposed Route
- Approximate ROW
- Approximate New Impact Area
- Project 115 kV Transmission Line (Single Circuit)
- Project 115 kV Transmission Line (Double Circuit)
- Removed Transmission Line (Realigned)
- Thermal Upgrades
- o Existing Structure
- o Structure in ROW
- Existing Transmission Line
- Existing Pipeline
- + Railroad
- Existing/Proposed Trail
- Impaired Water
- Designated Trout Stream
- PWI Watercourse
- FEMA Floodplain
- National Wetlands Inventory**
 - Freshwater Emergent Wetland
 - Freshwater Forested Wetland
 - Freshwater Shrub Wetland
 - Freshwater Pond; Lake; Riverine

*Note: Removals shown for significant realignments only. Line removals associated with the reconstruction of transmission lines, including minor centerline shifts are not indicated for clarity purposes. See Proposed System Overview for further definition on final line configurations and designations.



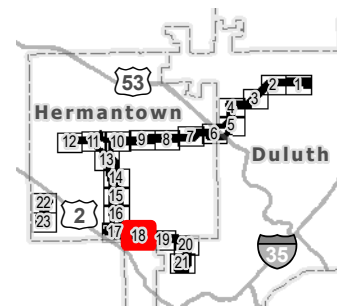
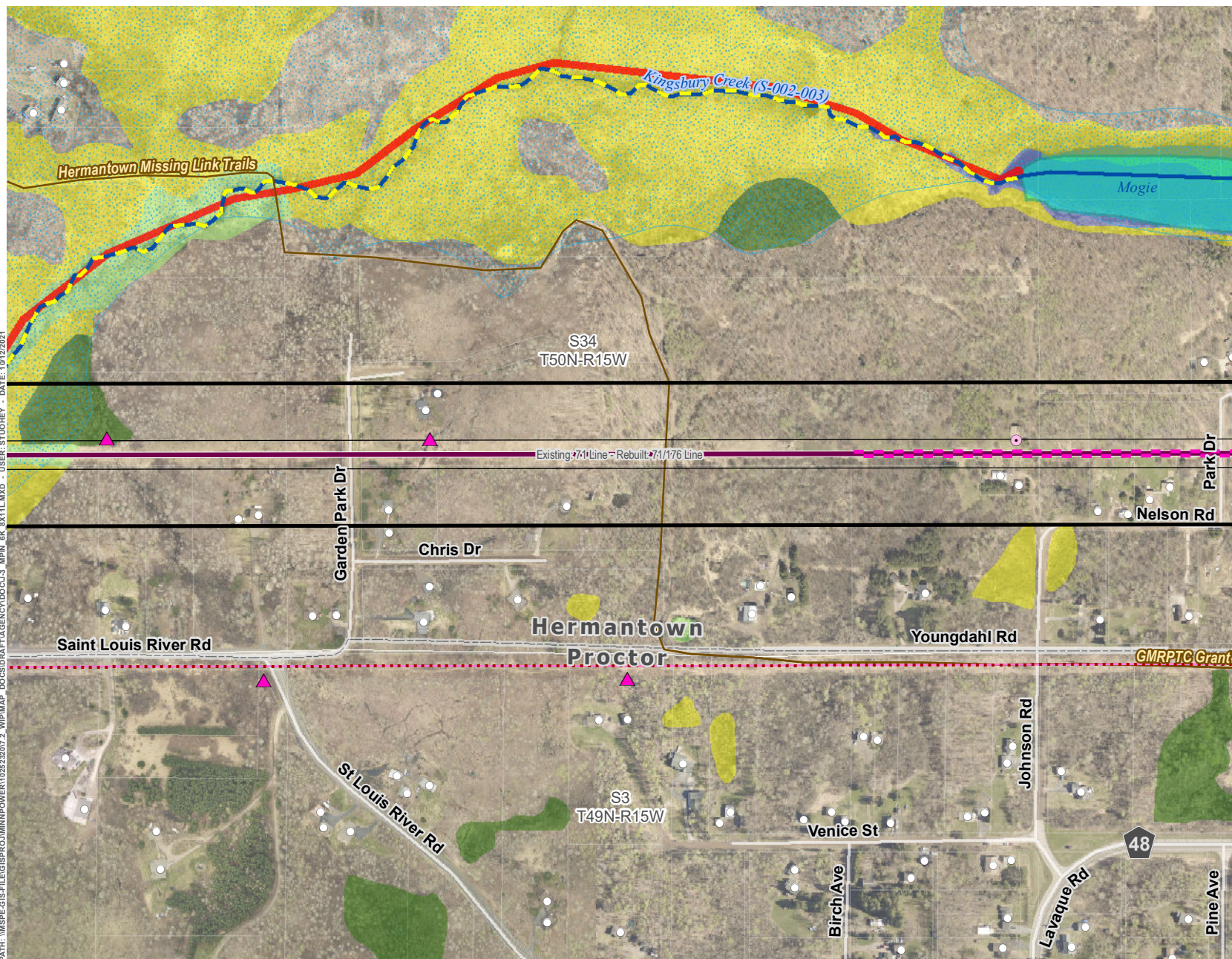
PROJECT DETAIL - HILLTOP TO HAINES ROAD

DULUTH LOOP RELIABILITY PROJECT

APPENDIX J-3: PAGE 17 OF 23



PATH: \\MSPE-GIS-FILES\GIS\PROJECTS\HILLTOP TO HAINES ROAD - USER: STUDNEY - DATE: 10/12/2021



LEGEND

- Proposed Route
- Approximate ROW
- Project 115 kV Transmission Line (Double Circuit)
- Thermal Upgrades
- Proposed Line Marking
- Existing Structure
- Structure in ROW
- Existing Transmission Line
- PWI Basin
- Existing/Proposed Trail
- Impaired Water
- Designated Trout Stream
- Unmapped Tributary
- PWI Watercourse
- FEMA Floodplain
- National Wetlands Inventory**
 - Freshwater Emergent Wetland
 - Freshwater Forested Wetland
 - Freshwater Shrub Wetland
 - Freshwater Pond; Lake; Riverine

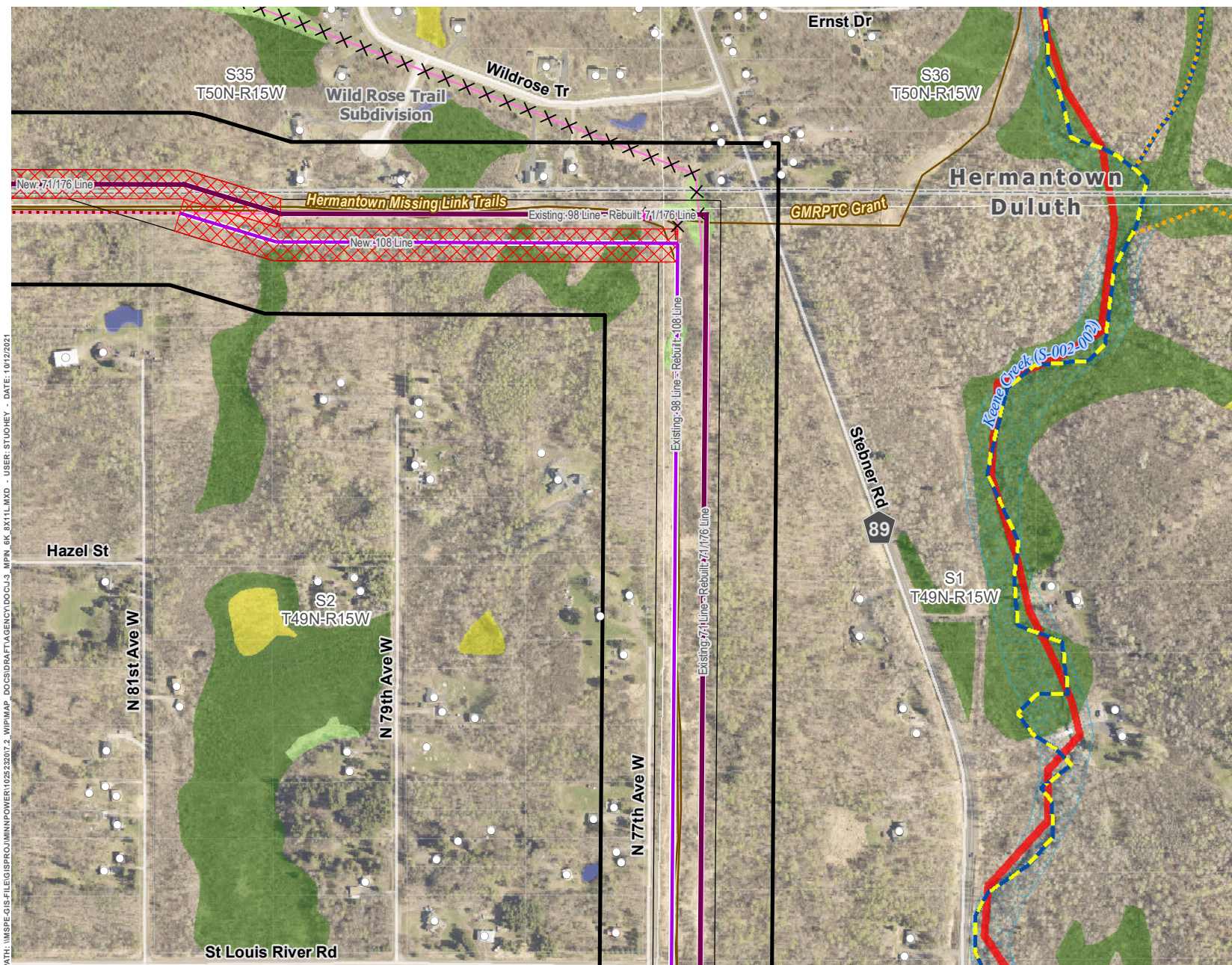
*Note: Removals shown for significant realignments only. Line removals associated with the reconstruction of transmission lines, including minor centerline shifts are not indicated for clarity purposes. See Proposed System Overview for further definition on final line configurations and designations.

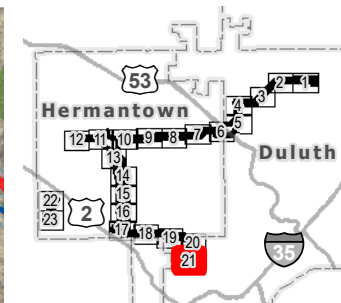
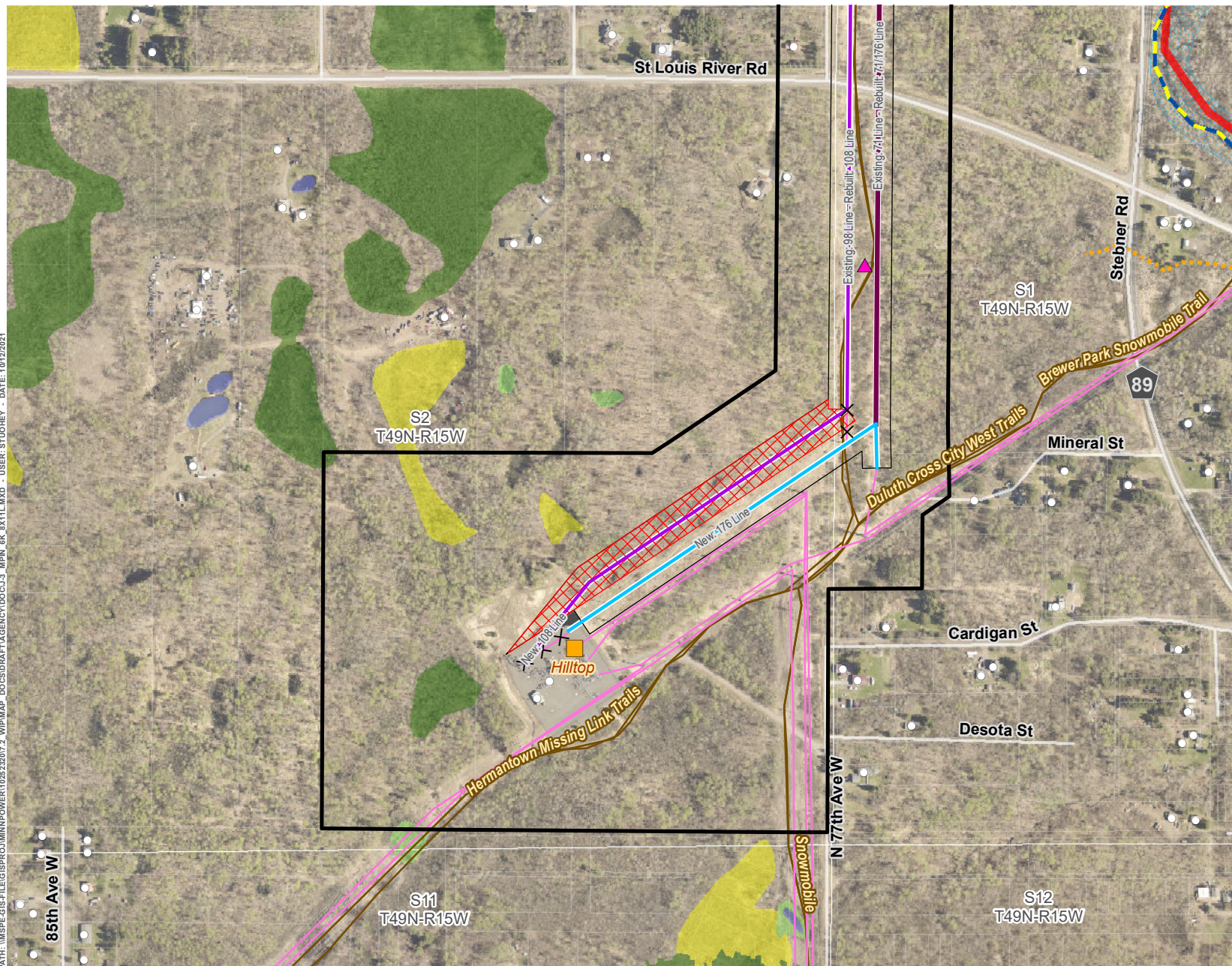


PROJECT DETAIL - HILLTOP TO HAINES ROAD DULUTH LOOP RELIABILITY PROJECT

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LEGEND

- Proposed Route
- Approximate ROW
- Approximate New Impact Area
- Project Substation
- Substation Expansion Area
- Project 115 kV Transmission Line (Single Circuit)
- Project 115 kV Transmission Line (Double Circuit)
- Project 230 kV Transmission Line (Single Circuit)
- Removed Transmission Line (Realigned)
- Existing Structure
- Existing Transmission Line
- Existing/Proposed Trail
- Impaired Water
- Designated Trout Stream
- Protected Tributary to Designated Trout Stream
- Unmapped Tributary
- PWI Watercourse
- FEMA Floodplain
- National Wetlands Inventory**
 - Freshwater Emergent Wetland
 - Freshwater Forested Wetland
 - Freshwater Shrub Wetland
 - Freshwater Pond; Lake; Riverine

*Note: Removals shown for significant realignments only. Line removals associated with the reconstruction of transmission lines, including minor centerline shifts are not indicated for clarity purposes. See Proposed System Overview for further definition on final line configurations and designations.

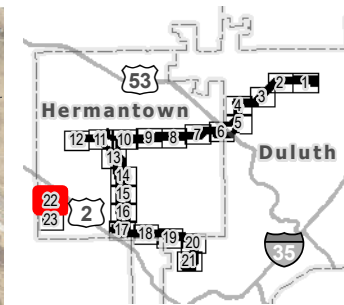
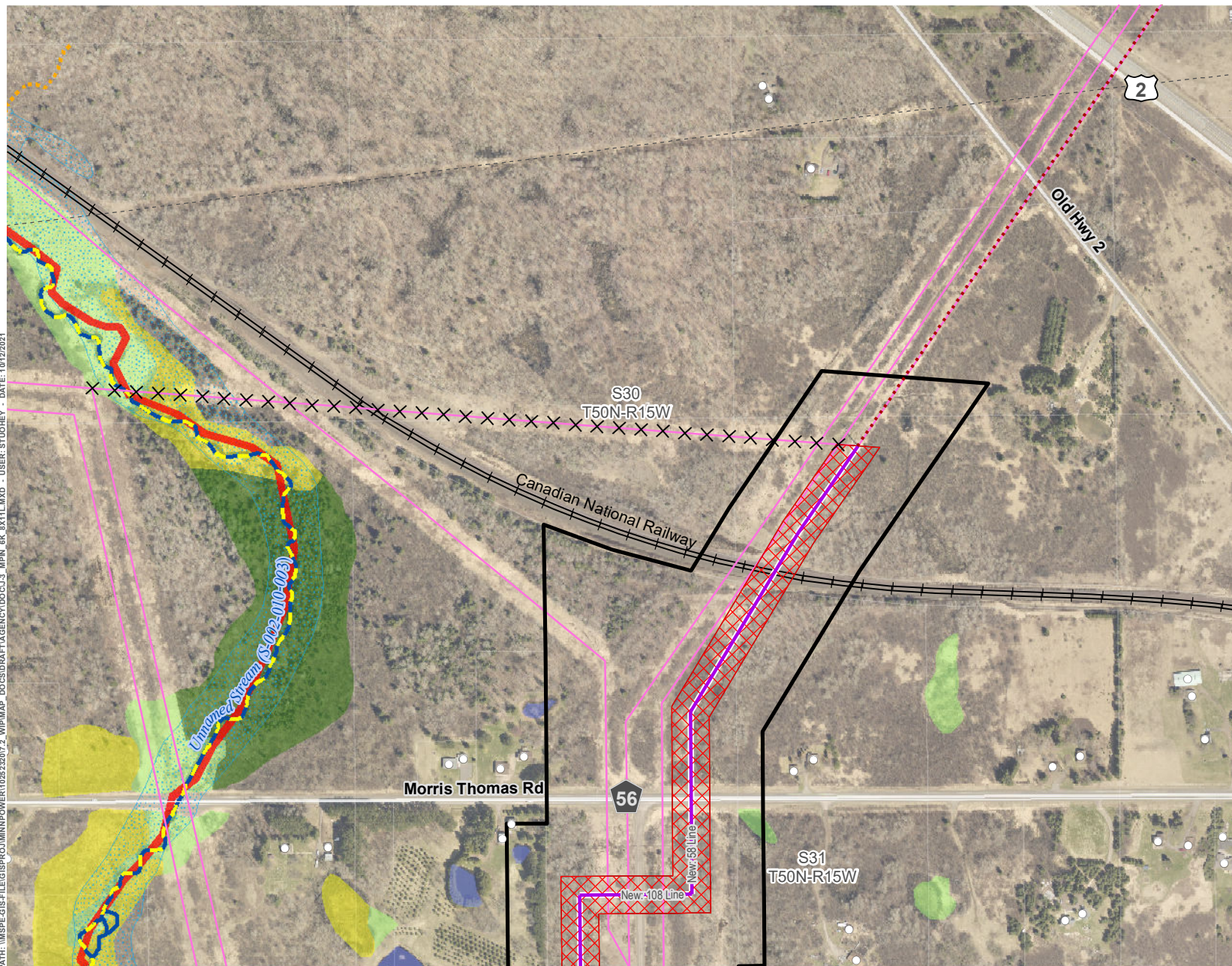


PROJECT DETAIL - HILLTOP TO HAINES ROAD DULUTH LOOP RELIABILITY PROJECT

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PATH: \\MSPE-GIS-FILE\GIS\PROJECTS\MINNPOWER\10252207\2_WPM\MAP DOCS\DATA\AGENCY\DOCS\J3_MPH_6K_0X1L.MXD - USER: STUDNEY - DATE: 10/12/2021



LEGEND

- Proposed Route
- Approximate ROW
- Approximate New Impact Area
- Project 230 kV Transmission Line (Single Circuit)
- Removed Transmission Line (Realigned)
- Thermal Upgrades
- Existing Structure
- Existing Transmission Line
- Existing Pipeline
- Railroad
- Existing/Proposed Trail
- Impaired Water
- Designated Trout Stream
- Protected Tributary to Designated Trout Stream
- PWI Watercourse
- FEMA Floodplain
- National Wetlands Inventory**
 - Freshwater Emergent Wetland
 - Freshwater Forested Wetland
 - Freshwater Shrub Wetland
 - Freshwater Pond; Lake; Riverine

*Note: Removals shown for significant realignments only. Line removals associated with the reconstruction of transmission lines, including minor centerline shifts are not indicated for clarity purposes. See Proposed System Overview for further definition on final line configurations and designations.



PROJECT DETAIL - ARROWHEAD DULUTH LOOP RELIABILITY PROJECT

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