

The Applicants evaluated the record and developed a route for the Project that builds upon the route discussed in **Attachment A** to the Applicants' September 19, 2024 Response to Public Hearing Comments (the "Modified Proposed Route") and incorporates additional route and alignment alternatives to allow for additional co-location (the "Co-location Maximization Route"). For the purposes of the Co-location Maximization Route, "co-location" may involve corridor consolidation (placing multiple transmission circuits adjacent to one another), infrastructure stacking (placing multiple transmission circuits on the same transmission structure), or a combination of both approaches to make room for siting the Project.

The Co-location Maximization Route increases the estimated Project mid-range cost to \$1,367.9 million (\$173.7 million more than the Modified Proposed Route) due, primarily, to the need to reconfigure and relocate existing transmission lines to accommodate the proposed co-locations. The Co-location Maximization Route incorporates the following revisions into the Modified Proposed Route¹ (a description of the Modified Proposed Route is included in **Attachment A** to the Applicants' September 19, 2024 Response to Public Hearing Comments):

- Alignment Alternative AA16 – this alignment alternative would consolidate Minnesota Power's existing 92 Line (230 kV) and 11 Line (115 kV) on the same structures between Blackberry Township and Wildwood Township in Crow Wing County for approximately 11 miles to allow the Project to be constructed on the existing 92 Line right-of-way before rejoining the Modified Proposed Route. Alignment alternative AA16 would increase the overall mid-range cost of the Project by approximately \$41.9 million. This modification is shown in **Appendix 1, Map Pages 3-7**.
- Alignment Alternative AA3 – this alignment alternative would consolidate Minnesota Power's existing 11 Line (115 kV) and 92 Line (230 kV) on the same structures for approximately five miles in Wolford Township in Crow Wing County within the Modified Proposed Route width north of the proposed Cuyuna Series Compensation Station and enable placement of the Project on the right-of-way currently used by Minnesota Power's 92 Line in this area. Alignment alternative

¹ The Co-location Maximization Route includes the following route and alignment alternatives that have been incorporated into the Modified Proposed Route: alignment alternative AA1, Swatara Route Width Expansion, modified route alternative H4 and H7, and modified alignment alternative AA17, in addition to the route and alignment alternatives discussed in this **Attachment B**.

AA3 would increase the overall mid-range cost of the Project by approximately \$29.2 million. This modification is shown in **Appendix 1, Map Pages 22-24**.

- Route Alternative E1 – this route alternative is approximately 7.2 miles in length and would deviate from the Modified Proposed Route starting at the Cuyuna Series Compensation Station and would replace Minnesota Power’s existing 92 Line (230 kV) with the Project’s new double circuit 345 kV line for approximately 1.5 miles until it crosses Little Rabbit Lake. The 92 Line would be relocated and consolidated with an existing 115 kV line in a nearby existing corridor. Following the Little Rabbit Lake crossing, the Project would then replace the existing Great River Energy Riverton – Blind Lake 69 kV Line (“RV Line”) through the Cuyuna Country State Recreation Area for approximately 0.6 miles. The RV Line would be relocated and consolidated with an existing 115 kV line in a nearby corridor. South of Minnesota Power’s existing Riverton 230/115 kV Substation, the Project would replace the Great River Energy Riverton - Wilson Lake 69 kV Line (RW Line) as it parallels the east side of the existing Great River Energy MR (230 kV) Line for approximately 1.2 miles. The RW Line would be relocated and consolidated with the existing MR (230 kV) Line in the same corridor. At the Highway 210 crossing, the entire corridor including the Project, the consolidated 230 kV and 69 kV lines, the 115 kV line, and an existing 34.5 kV distribution feeder, would be relocated to an alignment that balances impacts to homes on both sides of the highway. Approximately 1.4 miles south of Highway 210, the entire corridor would again be shifted to the west to limit impacts to homes along Nelson Road. In this part of the corridor, the Project would take over the centerline of the existing 230 kV line, with the consolidated 230 kV and 69 kV lines, and the 115 kV line relocated to the west in the right-of-way. The Project would continue on this alignment for 1.4 miles until it rejoins the proposed alignment at Woodrow Road. This route alternative would primarily utilize existing transmission right-of-way, however additional limited right-of-way will be needed. The existing Riverton 230 kV/115 kV Substation would also need to be expanded to accommodate additional 115 kV and 34.5 kV equipment that is necessary to enable retirement of the existing Riverton 115 kV/34.5 kV Distribution Substation, which would need to be removed to facilitate relocation of existing transmission lines as described above to make room for the Project. In total, Route Alternative E1 would introduce ten additional 230 kV, 115 kV, and 69 kV line segments, four additional 34.5 kV distribution feeders, and two substations to the overall scope of the Project. Route alternative E1 would increase the overall mid-range cost of the Project by approximately \$81.1 million. This modification is shown in **Appendix 1, Map Pages 24-27**.²
- Elk River Alignment Alternative – this alignment alternative would rebuild approximately 5.1 miles of existing MR Line (230-kV) and existing BP Line (69-kV) on common structures. From 2.3 miles north of the Benton County Substation, the Elk River Alignment Alternative would combine the existing MR Line (230 kV) and BP Line (69 kV) to the north for approximately 5 miles with new double-circuit

² The use of this route alternative would negate the need to use alignment alternatives AA9 and AA10.

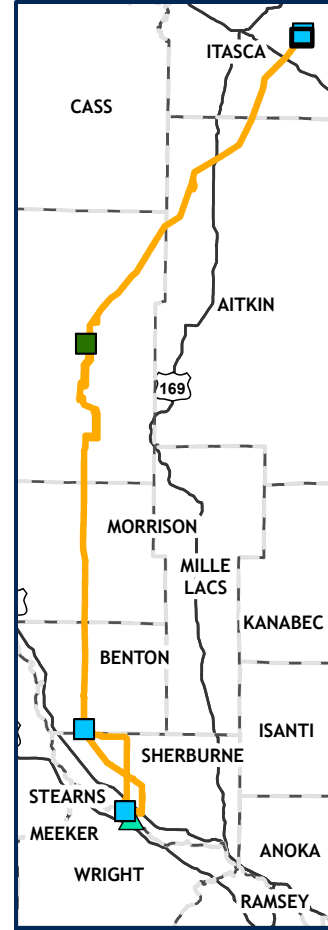
230/69 kV. The Project would be constructed adjacent, to the west, of the new double-circuit 230/69 kV line. At approximately 5.1 miles north of the Benton County Substation in Section 2 of Minden Township, Benton County, the Project alignment would be located west of Great River Energy's existing MR Line and BP Line. At the crossing of Golden Spike Road, the Elk River Alignment Alternative would shift to the east of the existing MR Line and BP Line centerlines to avoid impacting a residence just west of the existing lines and to minimize impacts to the Elk River. The Elk River Alignment Alternative would then continue north for approximately two miles, overtaking the existing MR Line and BP Line right-of-way with the 230 kV/69 kV double-circuit until the BP Line leaves the MR Line corridor at approximately 75th Street NE. This co-location would require 80 to 90 feet of additional right-of-way. The Elk River Alignment Alternative would increase the overall mid-range cost of the Project by approximately \$21.6 million. This modification is shown in **Appendix 1, Map Pages 48-50**.

A mapbook for the Co-location Maximization Route is provided as **Appendix 1**. The Co-location Maximization Route follows existing high-voltage transmission line rights-of-way for 90 percent of its length.

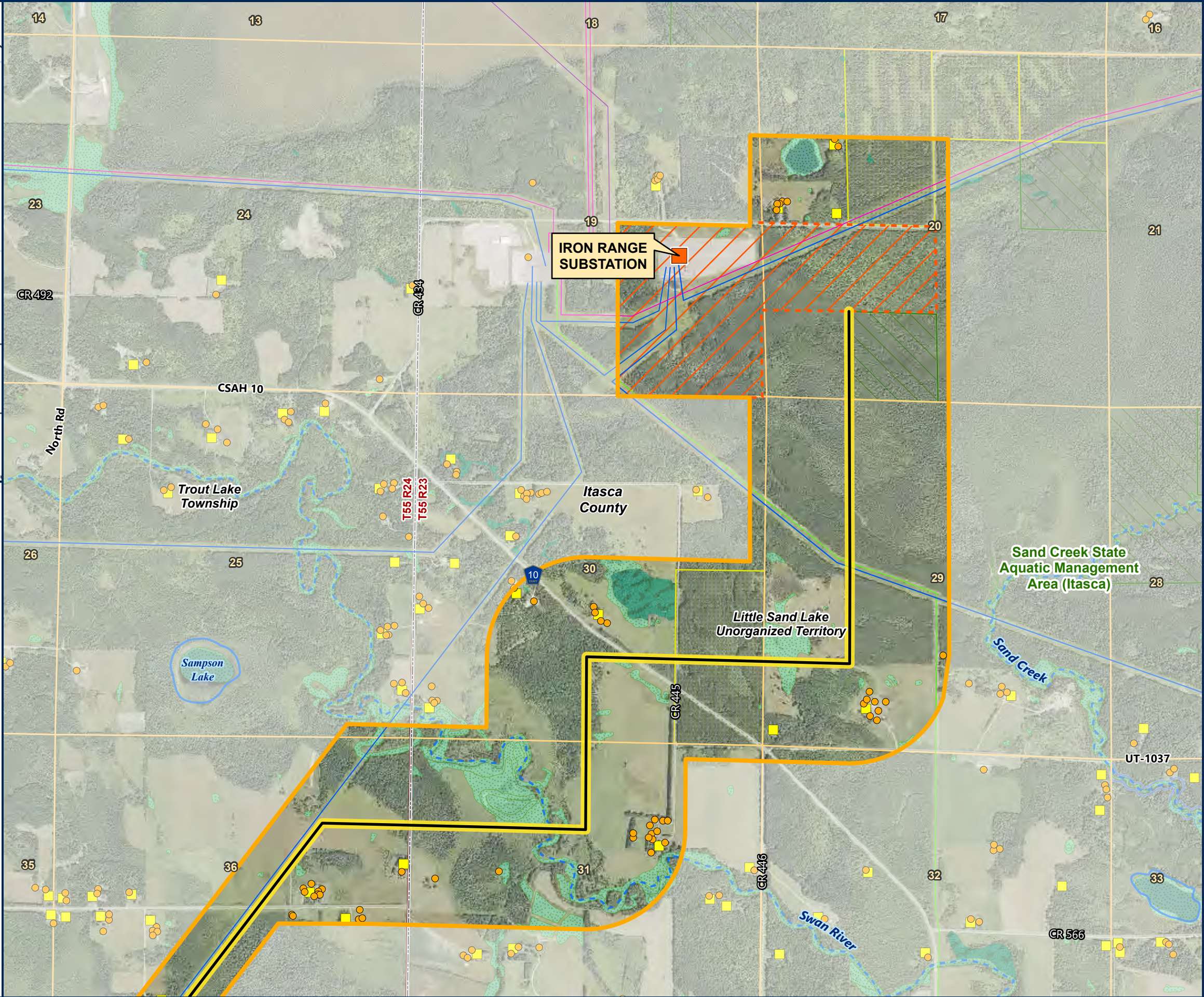
Additional analysis discussing the differences between the Modified Proposed Route and the Co-location Maximization Route are discussed in **Attachment C** to the Applicants' September 19, 2024 Response to Public Hearing Comments.

**Detailed Map
 Co-Location Maximization
 Route
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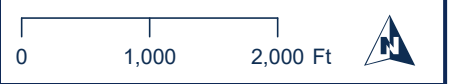
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Northland Reliability Project



- CO-LOCATION MAXIMIZATION ROUTE
- CO-LOCATION MAXIMIZATION ROUTE CENTERLINE
- APPLICATION RIGHT OF WAY
- CO-LOCATION MAXIMIZATION ROUTE RIGHT OF WAY
- REPLACE GRE-BS LINE
- REPLACE MR LINE
- REBUILD EXISTING 69KV
- SHIFT MR MODIFIED, 230KV
- DOUBLE-CIRCUIT 230/115KV (92 LINE/11 LINE)
- SHIFT DOUBLE-CIRCUIT 230/69KV (MR LINE/BP LINE)
- SHIFT 11 LINE, 115KV
- SHIFT 92 LINE, 230KV
- REBUILD EXISTING TRANSMISSION FOR AA3 AND E1
- EXISTING TRANSMISSION LINE**
- 69 KV
- 115 KV
- 230 KV
- 345 KV OR GREATER
- SUBSTATION SITING AREA
- BIG OAKS SUBSTATION AREA
- IRON RANGE SUBSTATION
- RESIDENCE
- NOT A RESIDENCE
- PWI WATERCOURSE
- PWI WATERBODY
- NON-FORESTED WETLAND
- FORESTED WETLAND
- WILDLIFE MANAGEMENT AREA
- STATE CONSERVATION EASEMENT
- FEDERAL CONSERVATION EASEMENT
- AQUATIC MANAGEMENT AREA
- STATE FOREST
- STATE PARK
- OTHER DNR LAND
- COUNTY BOUNDARY



**Detailed Map
 Co-Location Maximization
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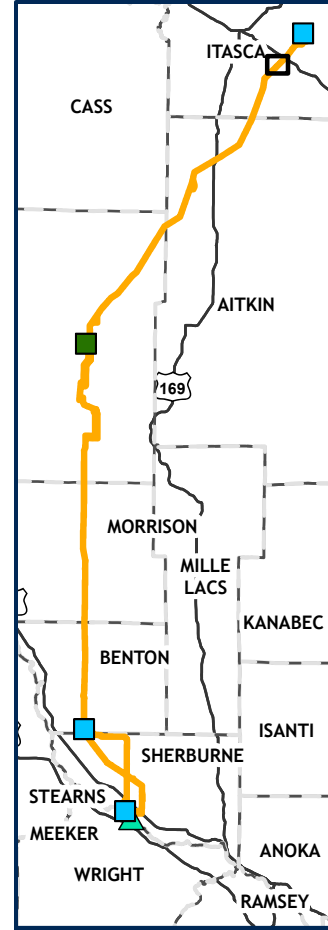
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- CO-LOCATION MAXIMIZATION ROUTE CENTERLINE
- APPLICATION RIGHT OF WAY
- CO-LOCATION MAXIMIZATION ROUTE RIGHT OF WAY
- REPLACE GRE-BS LINE
- REPLACE MR LINE
- REBUILD EXISTING 69KV
- SHIFT MR MODIFIED, 230KV
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- SHIFT DOUBLE-CIRCUIT 230/69KV (MR LINE/BP LINE)
- SHIFT 11 LINE, 115KV
- SHIFT 92 LINE, 230KV
- REBUILD EXISTING TRANSMISSION FOR AA3 AND E1
- EXISTING TRANSMISSION LINE**
- 69 KV
- 230 KV
- SUBSTATION SITING AREA
- BIG OAKS SUBSTATION AREA
- RESIDENCE
- NOT A RESIDENCE
- PWI WATERCOURSE
- PWI WATERBODY
- NON-FORESTED WETLAND
- FORESTED WETLAND
- WILDLIFE MANAGEMENT AREA
- STATE CONSERVATION EASEMENT
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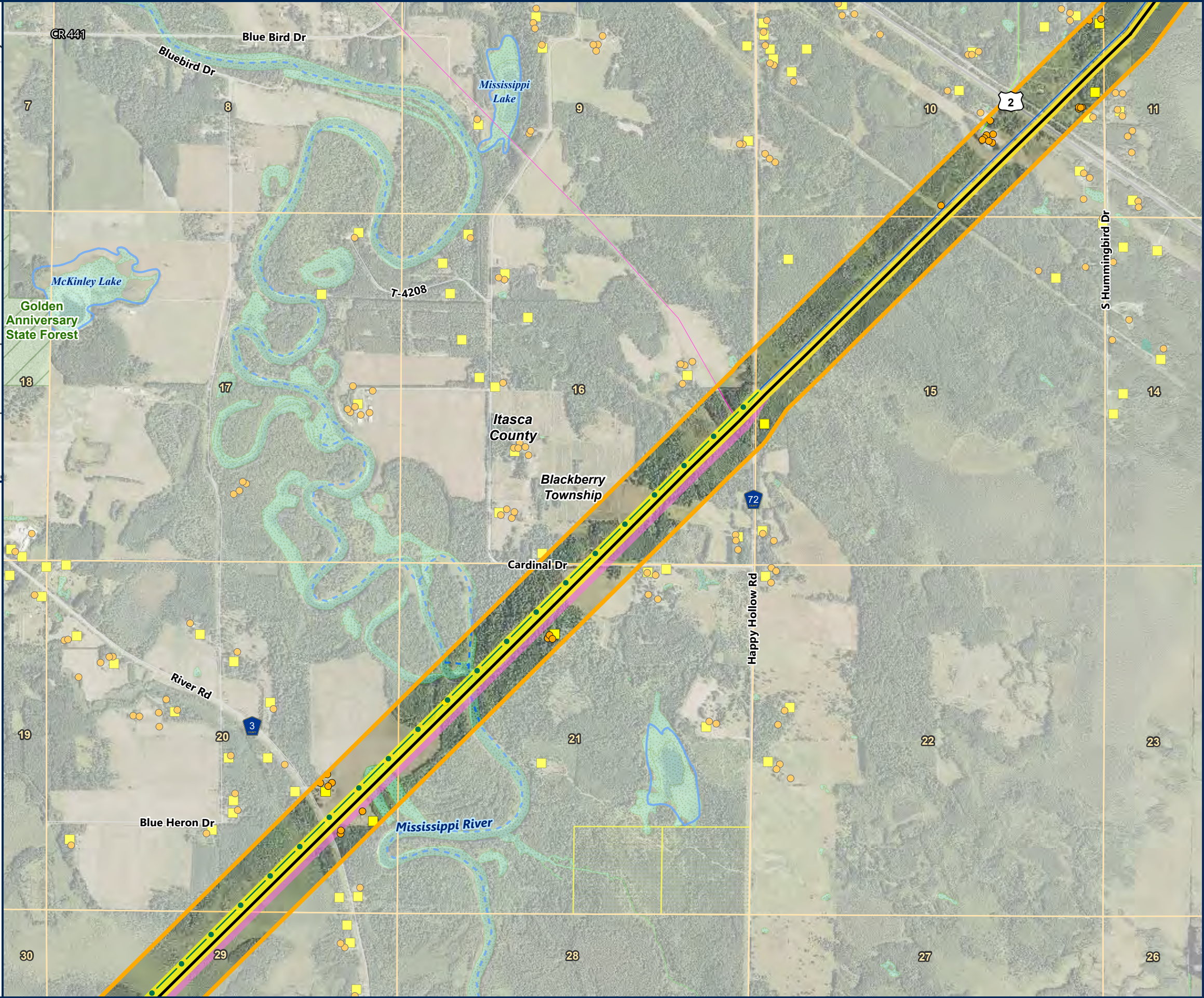
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Route
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




















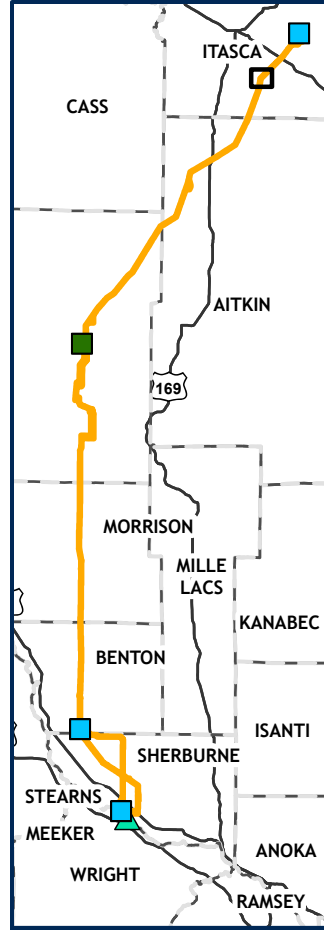
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- APPLICATION RIGHT OF WAY
- CO-LOCATION MAXIMIZATION ROUTE RIGHT OF WAY
- REPLACE GRE-BS LINE
- REPLACE MR LINE
- REBUILD EXISTING 69KV
- SHIFT MR MODIFIED, 230KV
- DOUBLE-CIRCUIT 230/115KV (92 LINE/11 LINE)
- SHIFT DOUBLE-CIRCUIT 230/69KV (MR LINE/BP LINE)
- SHIFT 11 LINE, 115KV
- SHIFT 92 LINE, 230KV
- REBUILD EXISTING TRANSMISSION FOR AA3 AND E1
- EXISTING TRANSMISSION LINE**
- 69 KV
- 115 KV
- 230 KV
- SUBSTATION SITING AREA
- BIG OAKS SUBSTATION AREA
- RESIDENCE
- NOT A RESIDENCE
- PWI WATERCOURSE
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- NON-FORESTED WETLAND
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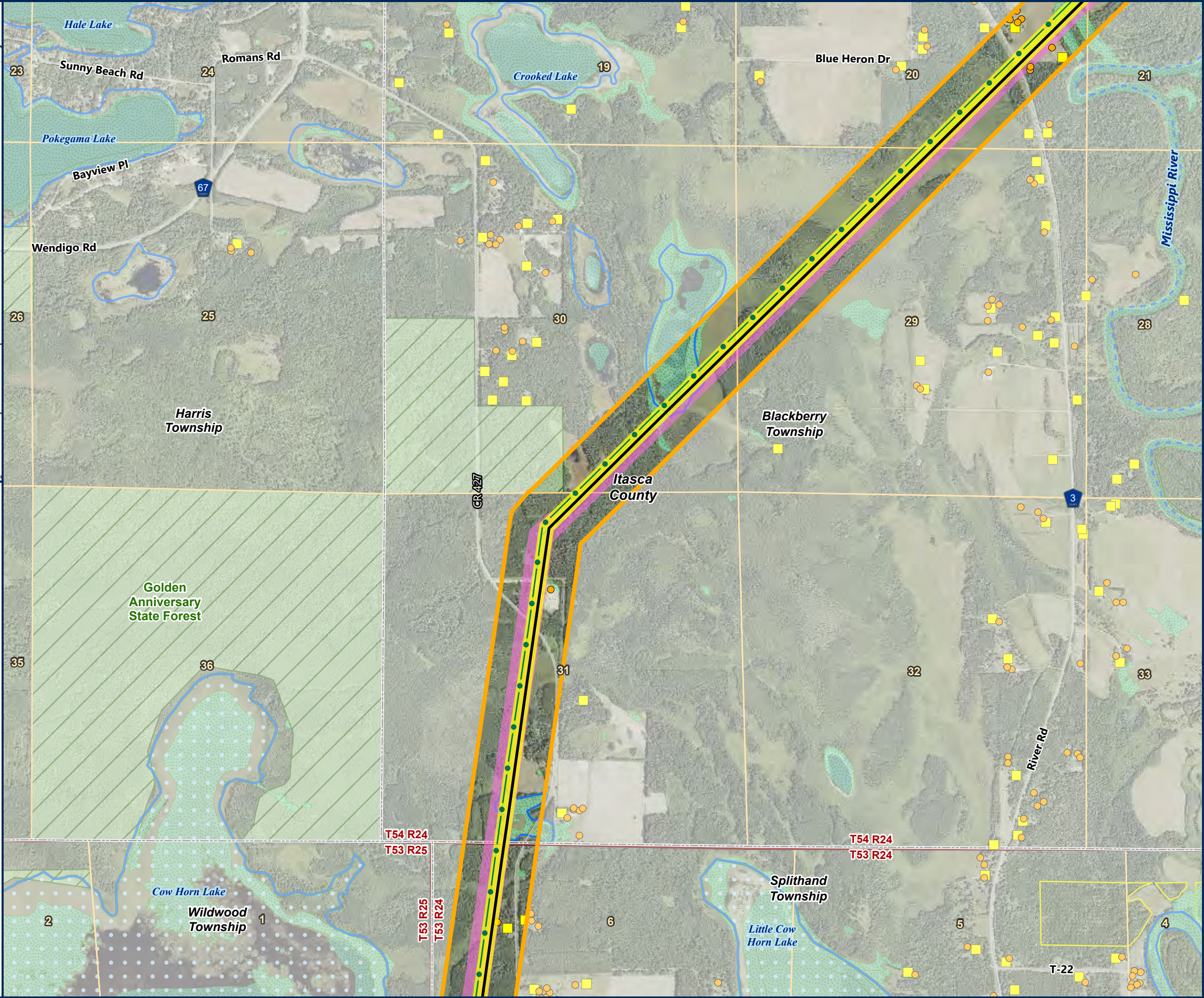
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Detailed Map
Co-Location Maximization
Route
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-  CO-LOCATION MAXIMIZATION ROUTE
-  CO-LOCATION MAXIMIZATION ROUTE CENTERLINE
-  APPLICATION RIGHT OF WAY
-  CO-LOCATION MAXIMIZATION ROUTE RIGHT OF WAY
-  REPLACE GRE-BS LINE
-  REPLACE MR LINE
-  REBUILD EXISTING 69KV
-  SHIFT MR MODIFIED, 230KV
-  DOUBLE-CIRCUIT 230/115KV (92 LINE/11 LINE)
-  SHIFT DOUBLE-CIRCUIT 230/69KV (MR LINE/BP LINE)
-  SHIFT 11 LINE, 115KV
-  SHIFT 92 LINE, 230KV
-  REBUILD EXISTING TRANSMISSION FOR AA3 AND E1
- EXISTING TRANSMISSION LINE**
-  115 KV
-  230 KV
-  SUBSTATION SITING AREA
-  BIG OAKS SUBSTATION AREA
-  RESIDENCE
-  NOT A RESIDENCE
-  PWI WATERCOURSE
-  PWI WATERBODY
-  NON-FORESTED WETLAND
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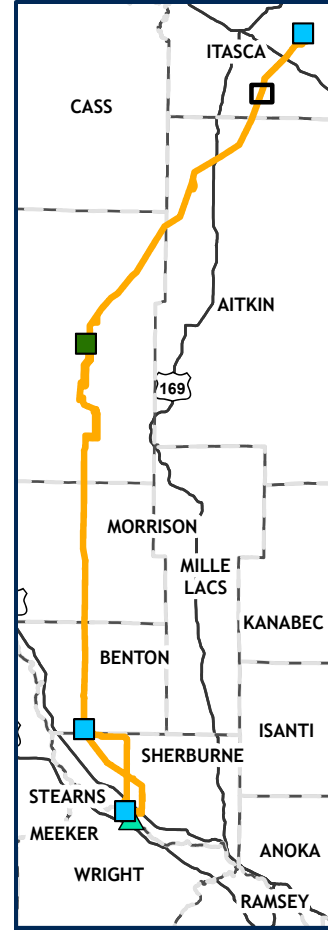


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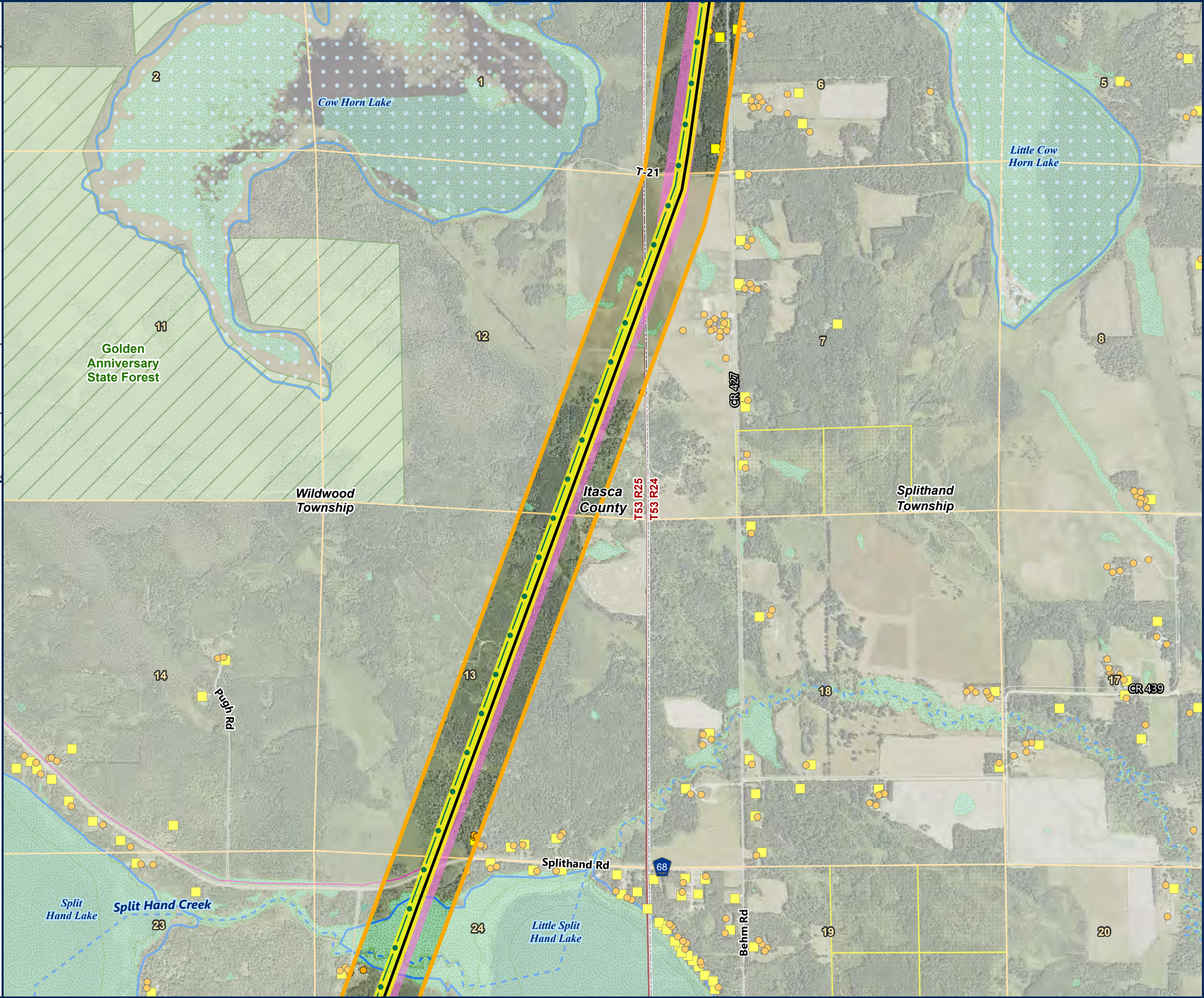



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- CO-LOCATION MAXIMIZATION ROUTE CENTERLINE
- APPLICATION RIGHT OF WAY
- CO-LOCATION MAXIMIZATION ROUTE RIGHT OF WAY
- REPLACE GRE-BS LINE
- REPLACE MR LINE
- REBUILD EXISTING 69KV
- SHIFT MR MODIFIED, 230KV
- DOUBLE-CIRCUIT 230/115KV (92 LINE/11 LINE)
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- SHIFT 11 LINE, 115KV
- SHIFT 92 LINE, 230KV
- REBUILD EXISTING TRANSMISSION FOR AA3 AND E1

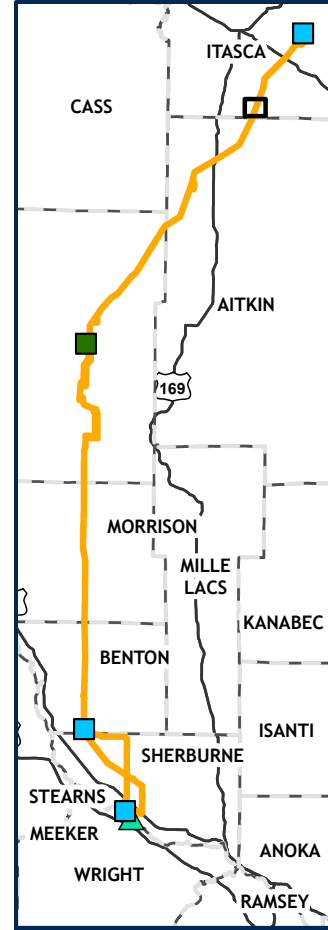
EXISTING TRANSMISSION LINE

- 115 KV
- 230 KV

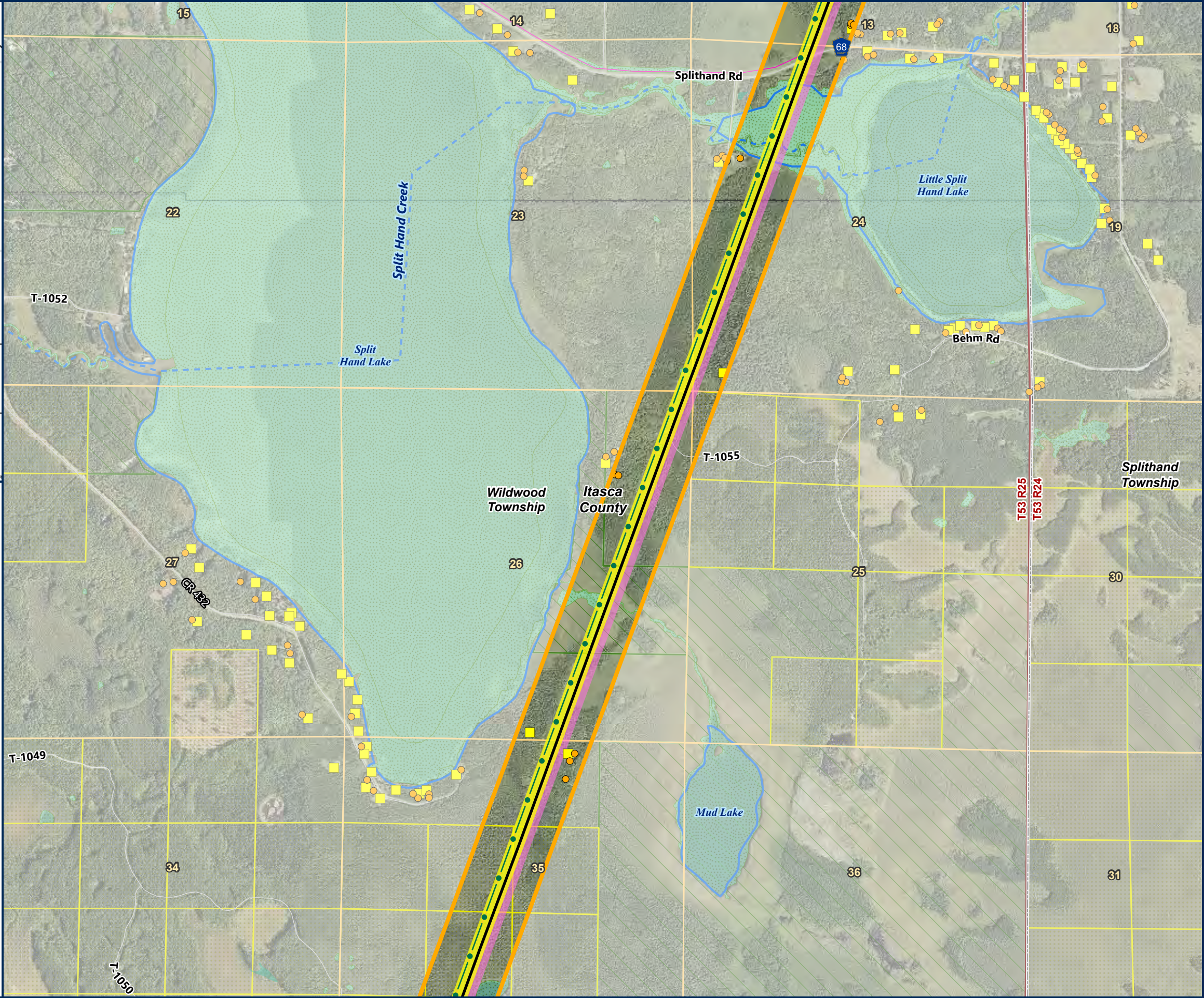
- SUBSTATION SITING AREA
- BIG OAKS SUBSTATION AREA
- RESIDENCE
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- PWI WATERCOURSE
- PWI WATERBODY
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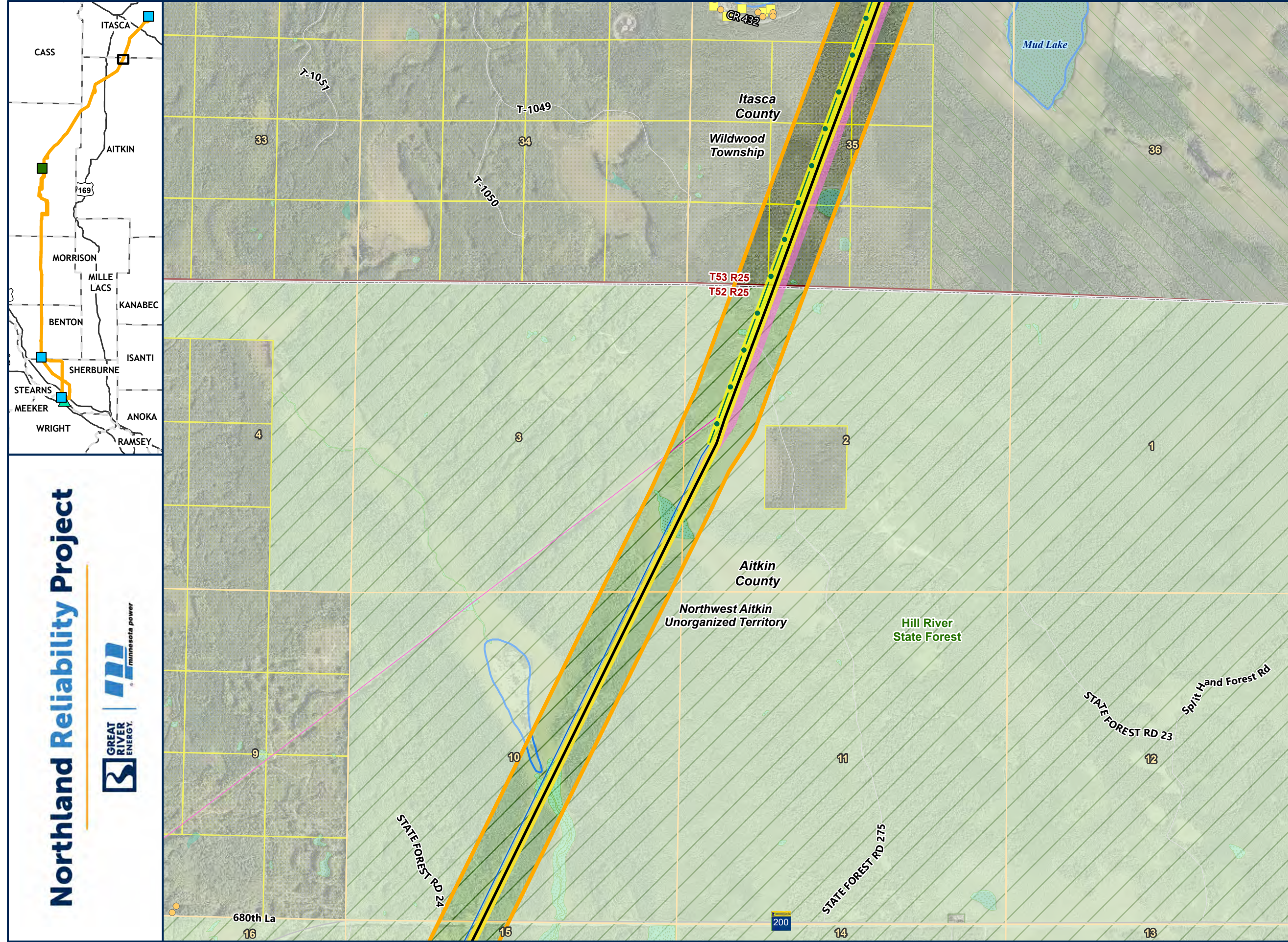


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- REPLACE GRE-BS LINE
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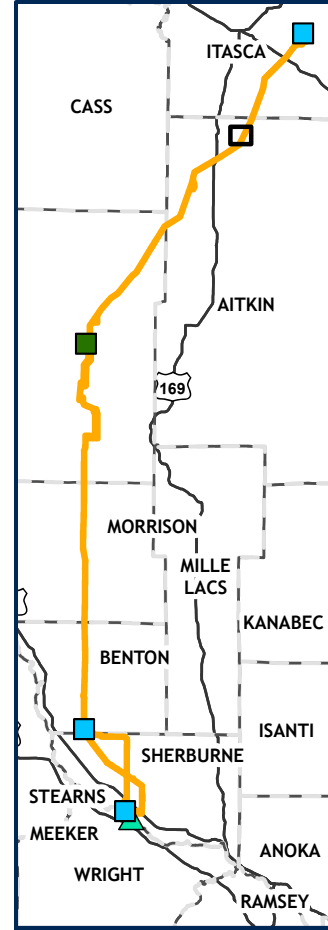
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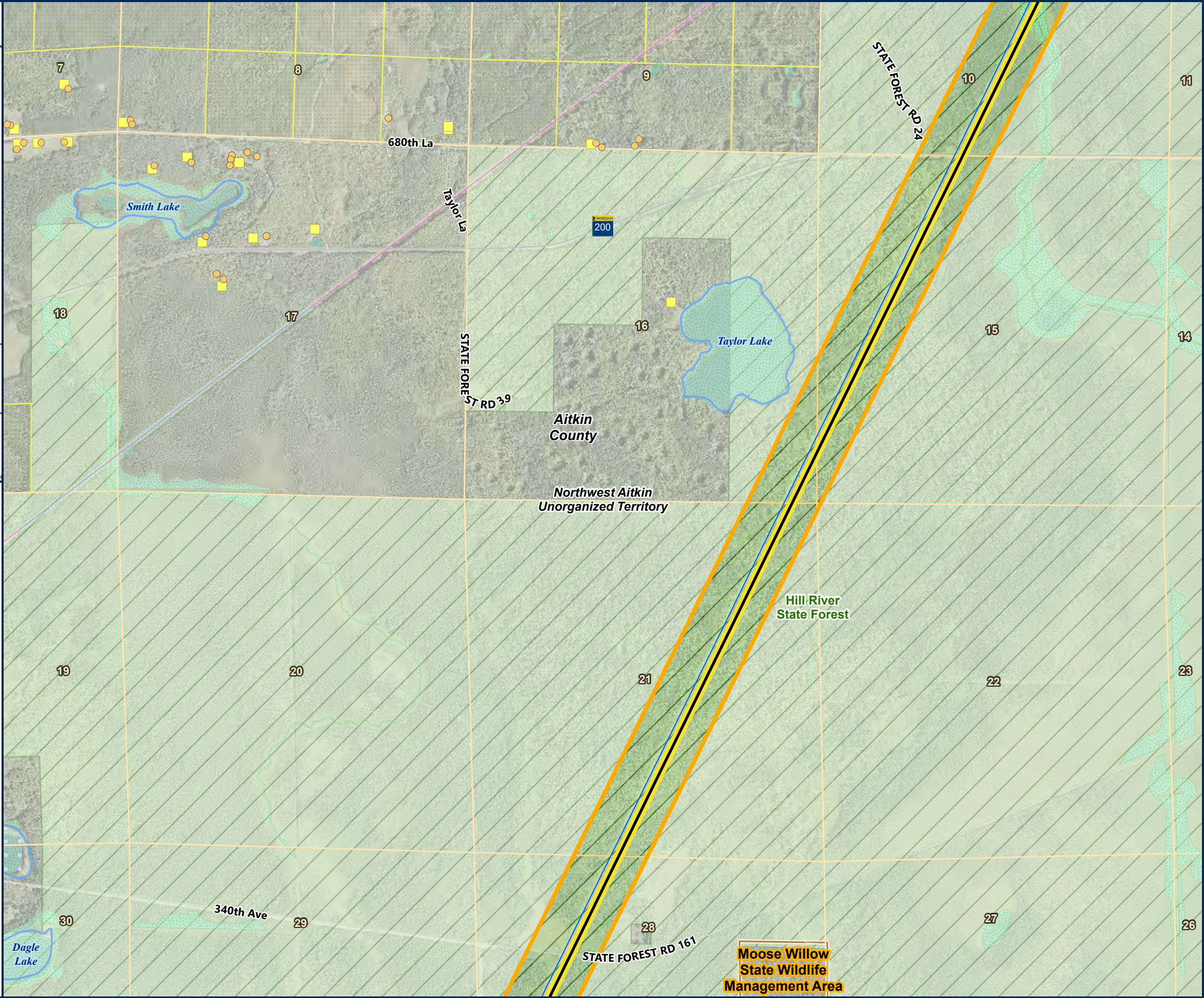
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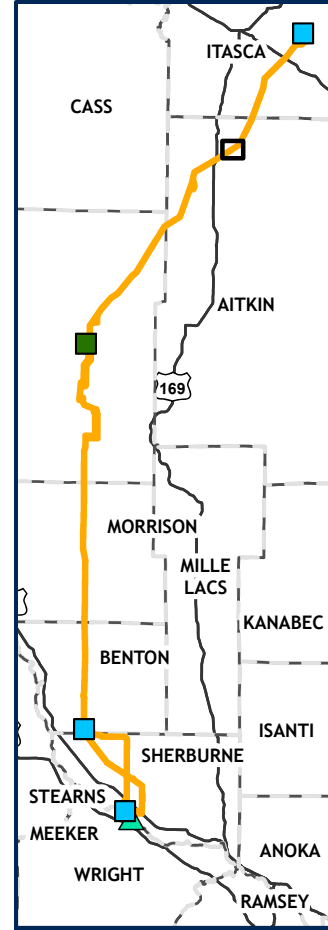


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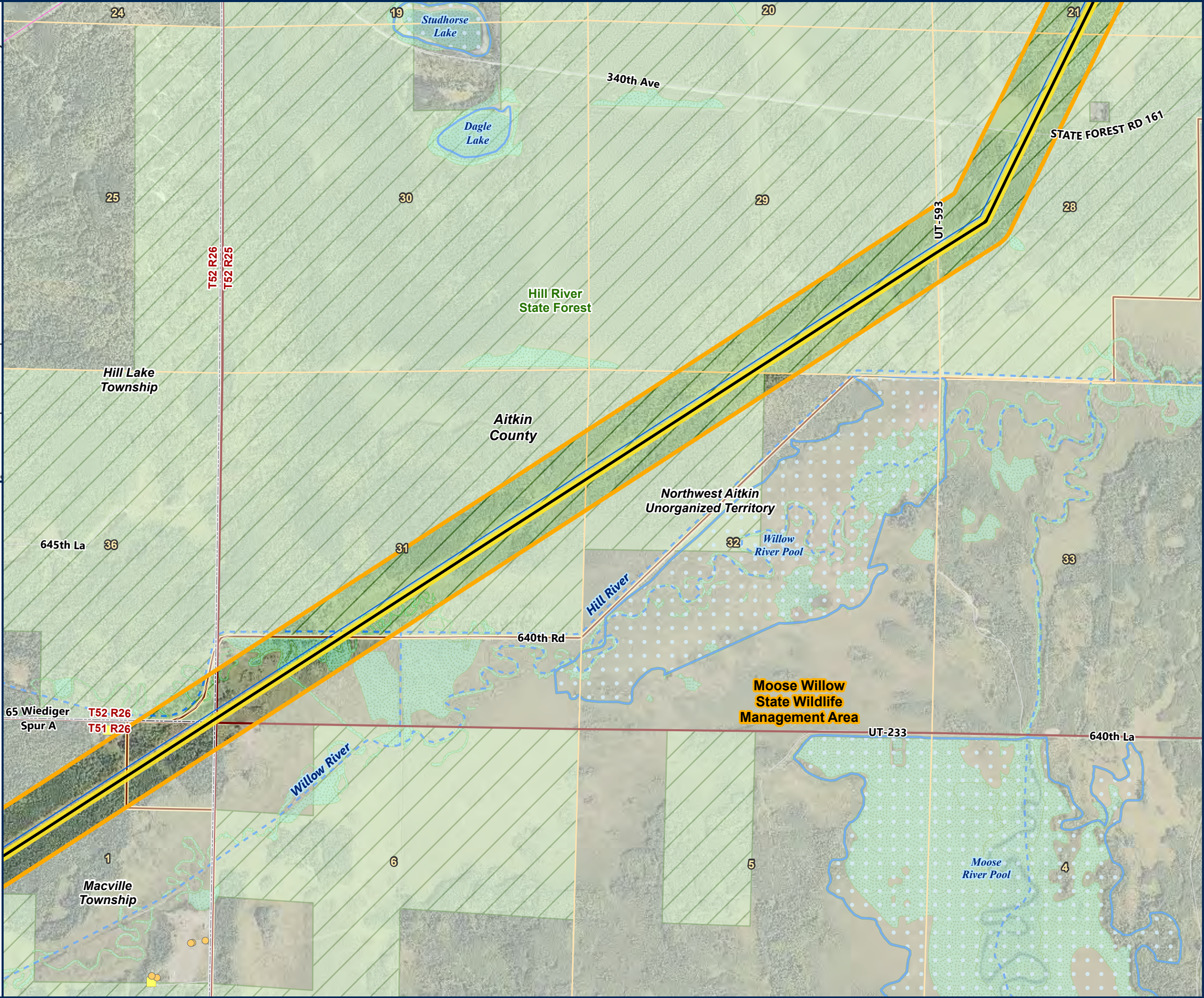


**Detailed Map
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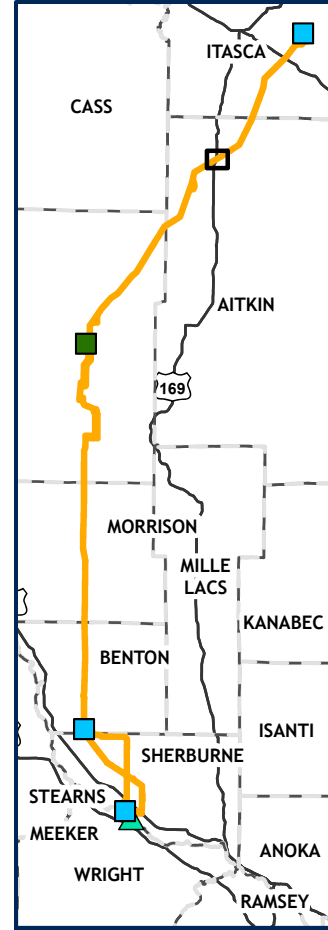


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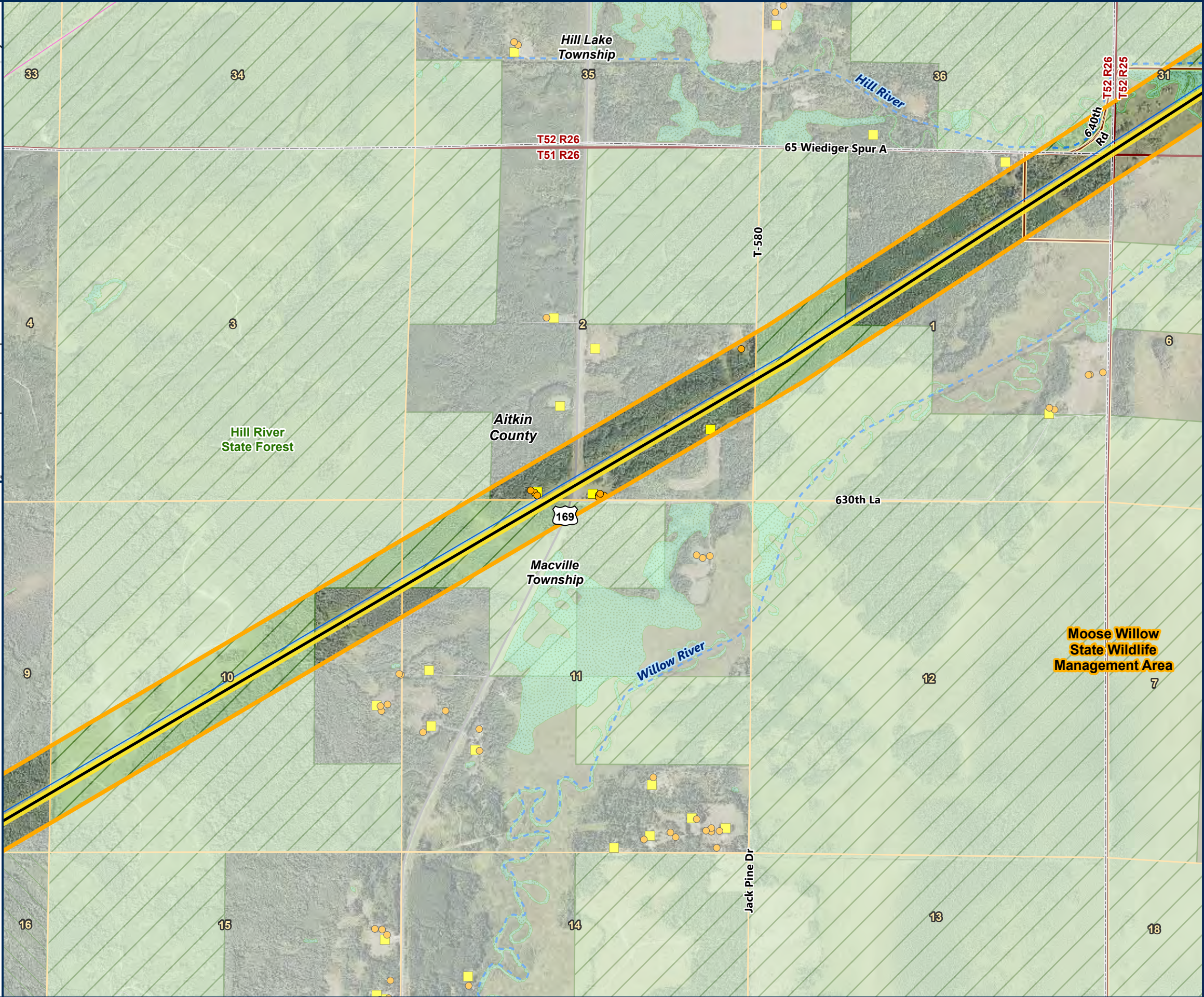
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**Detailed Map
 Co-Location Maximization
 Route
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Northland Reliability Project

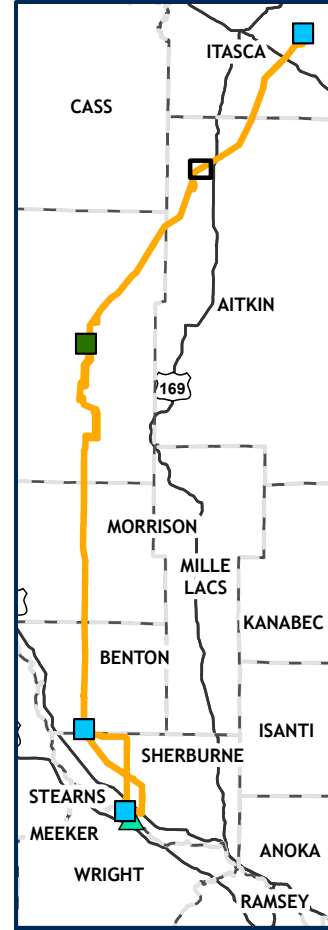


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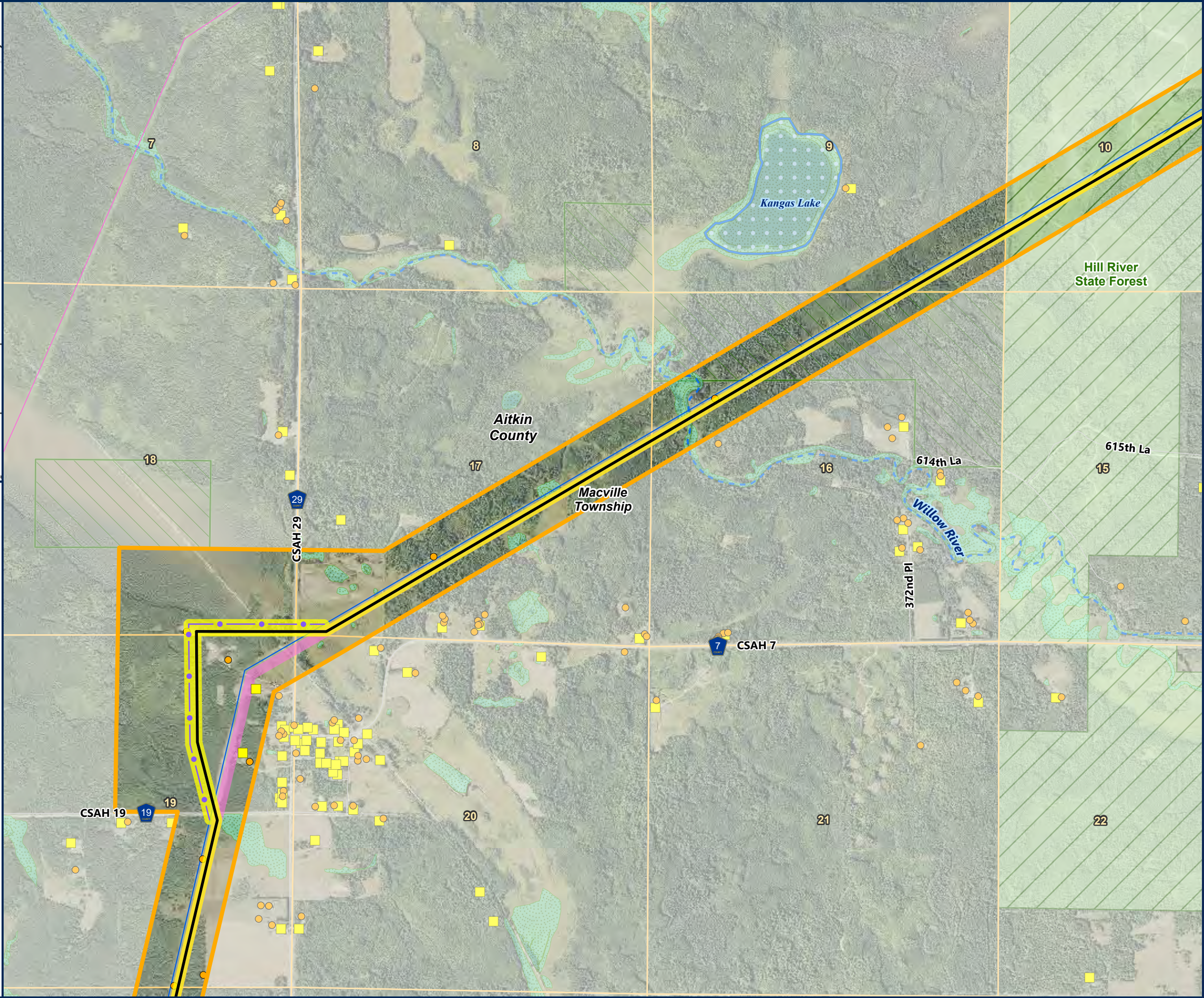


**Detailed Map
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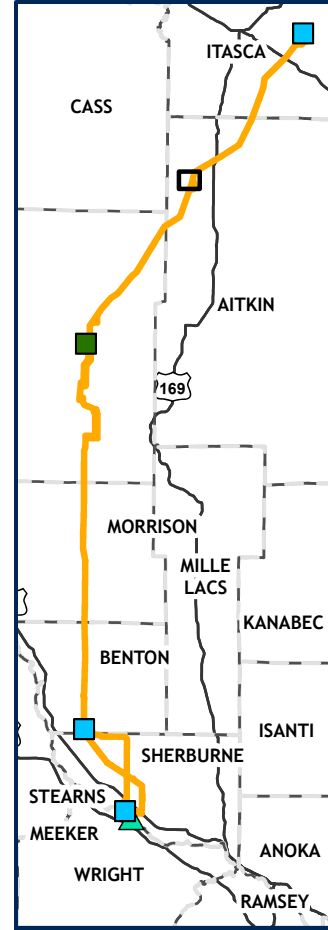


- CO-LOCATION MAXIMIZATION ROUTE
- CO-LOCATION MAXIMIZATION ROUTE CENTERLINE
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- NOT A RESIDENCE
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- STATE CONSERVATION EASEMENT
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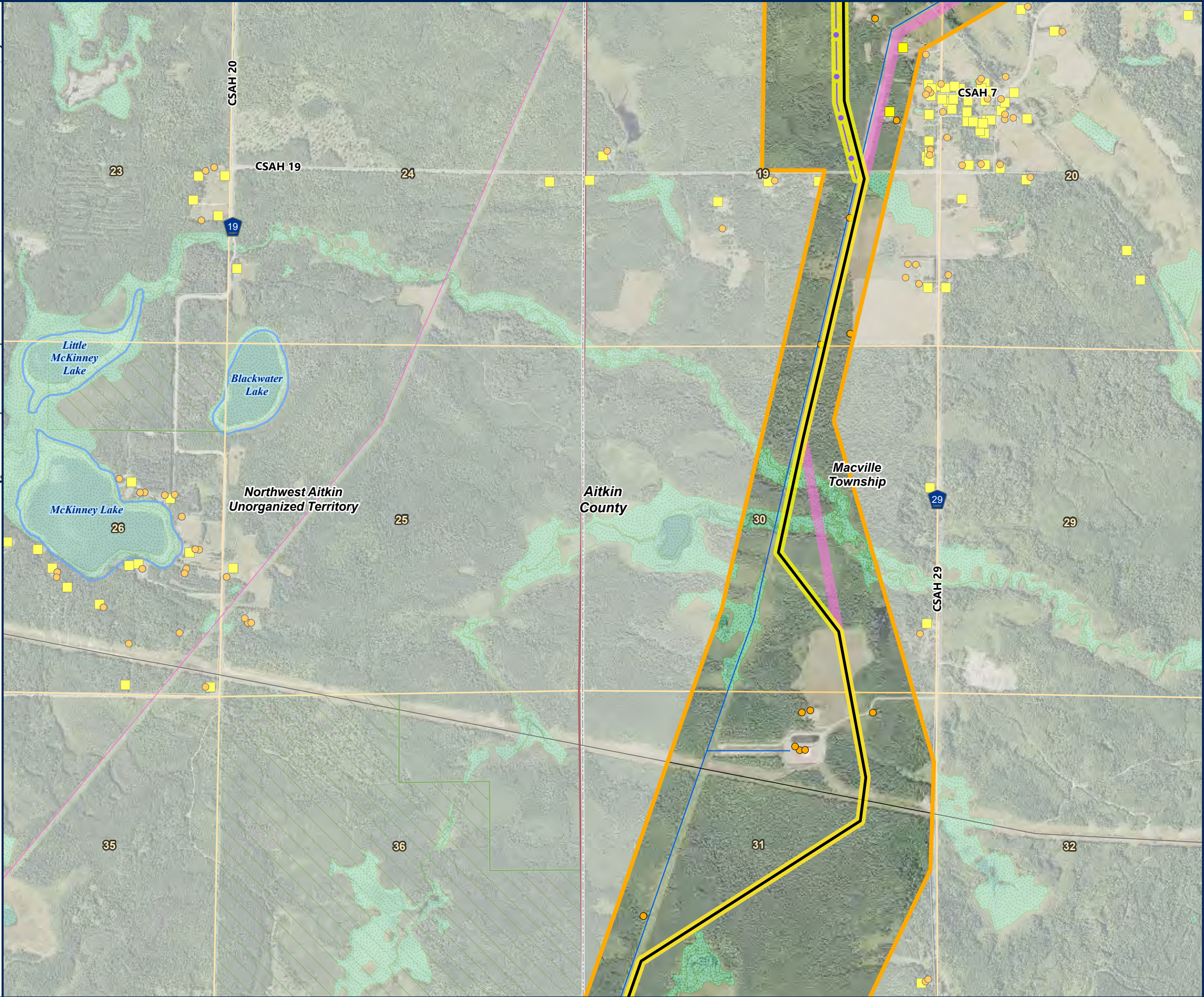


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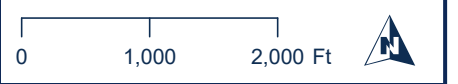
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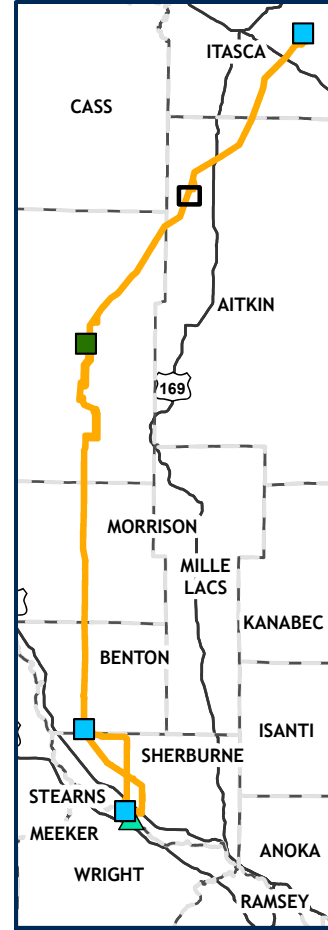


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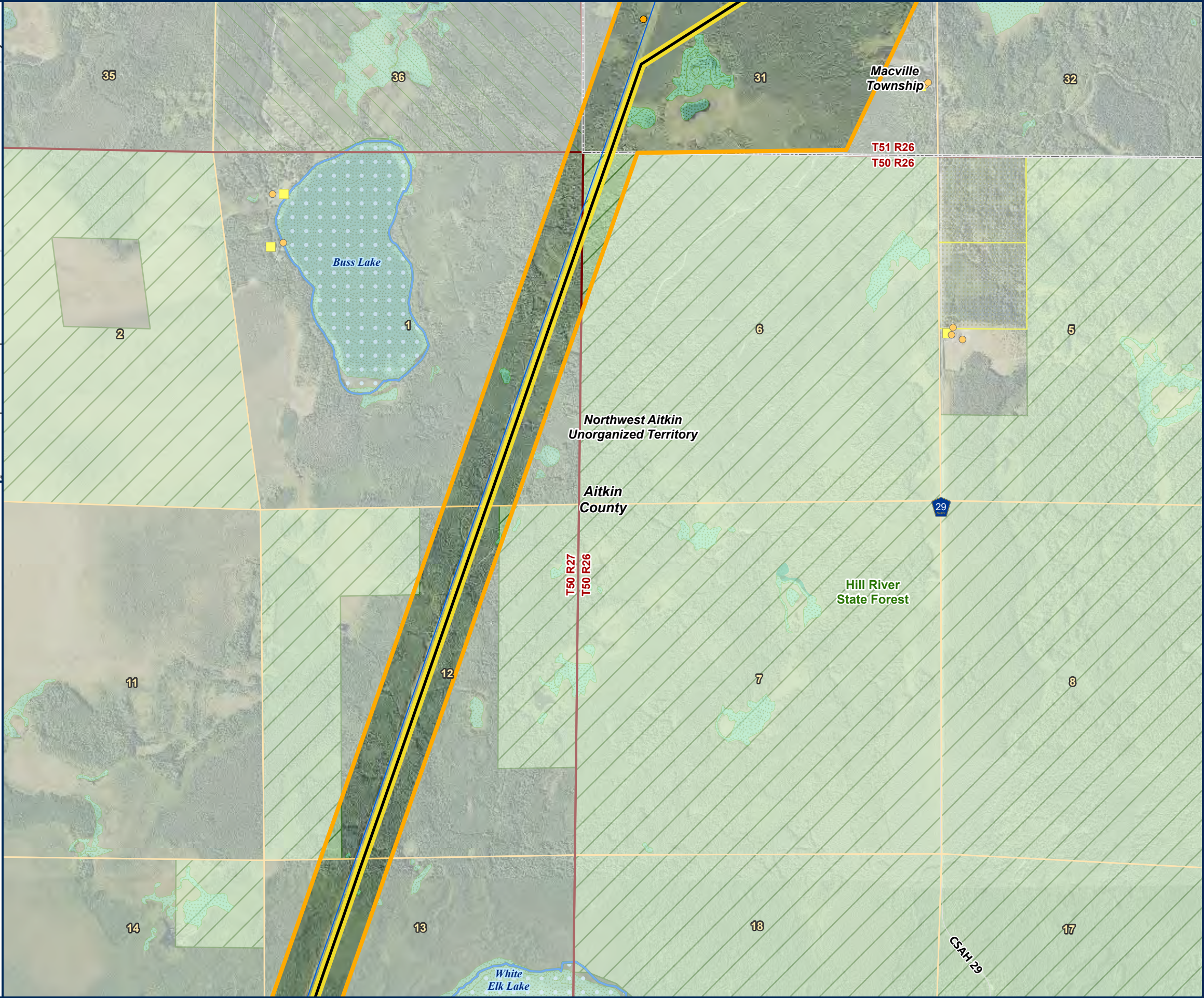


Detailed Map
Co-Location Maximization
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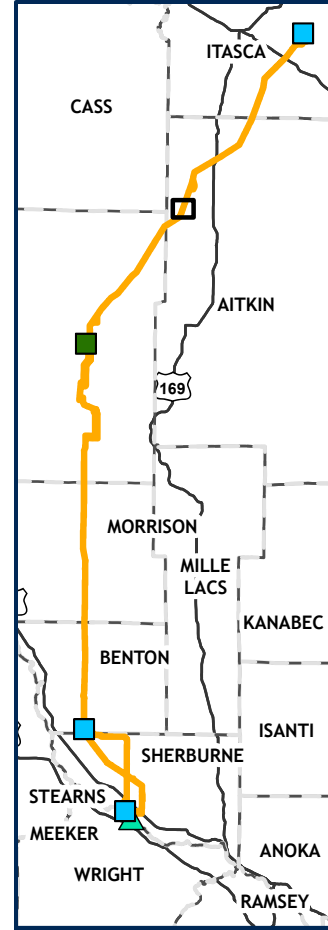


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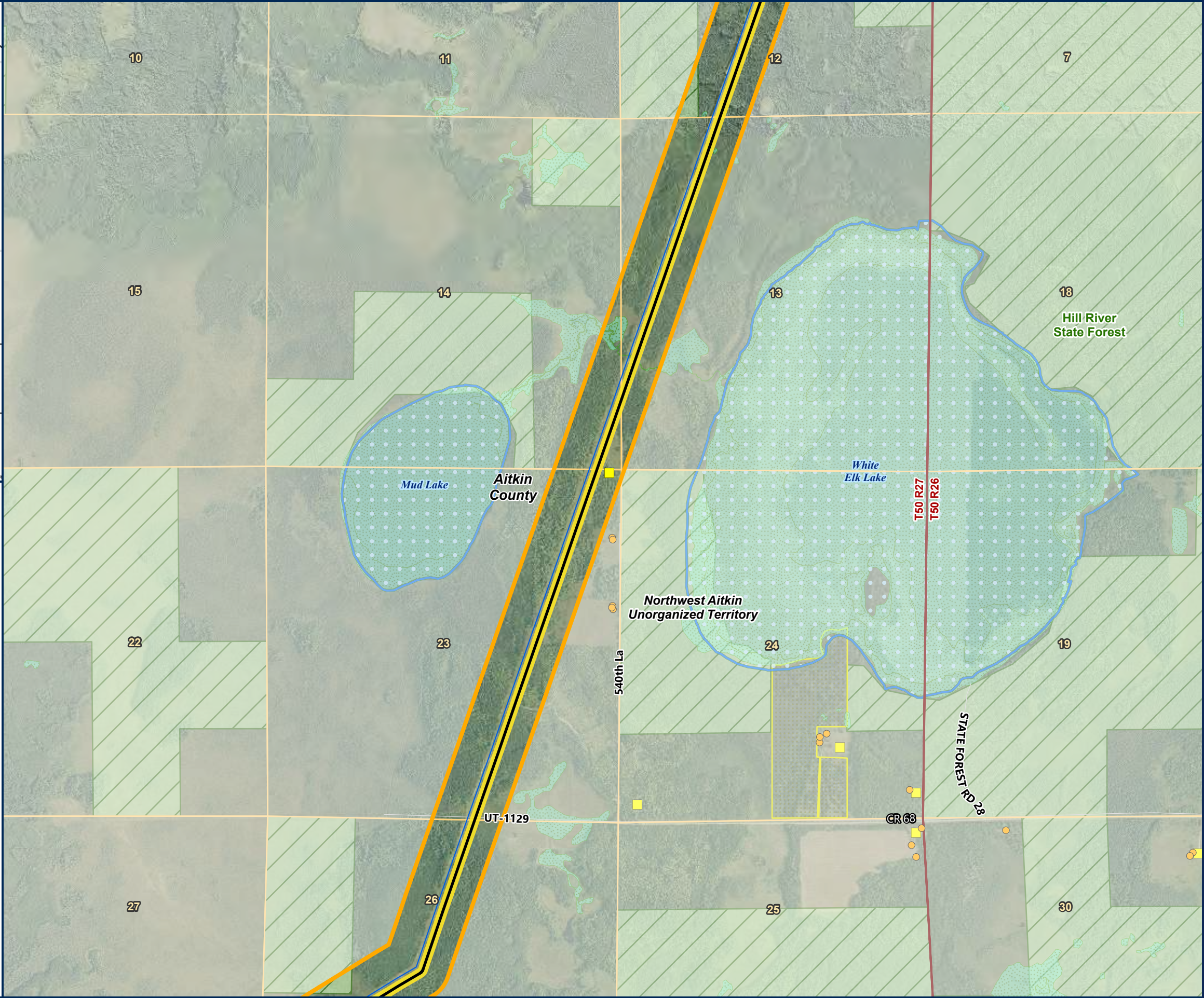


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Co-Location Maximization
Route
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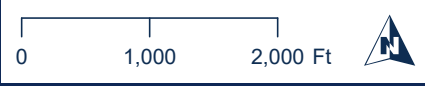
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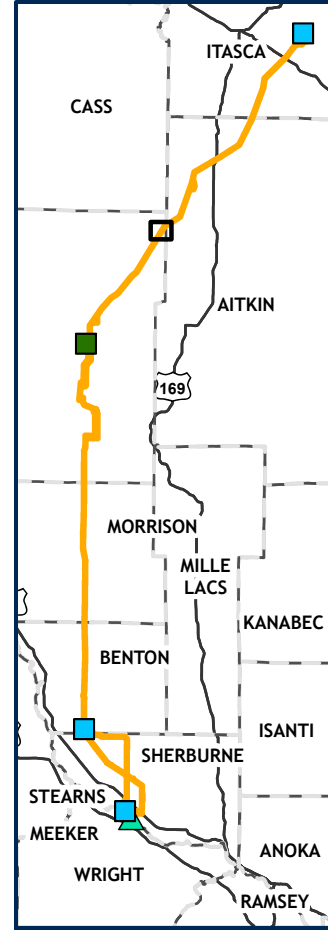
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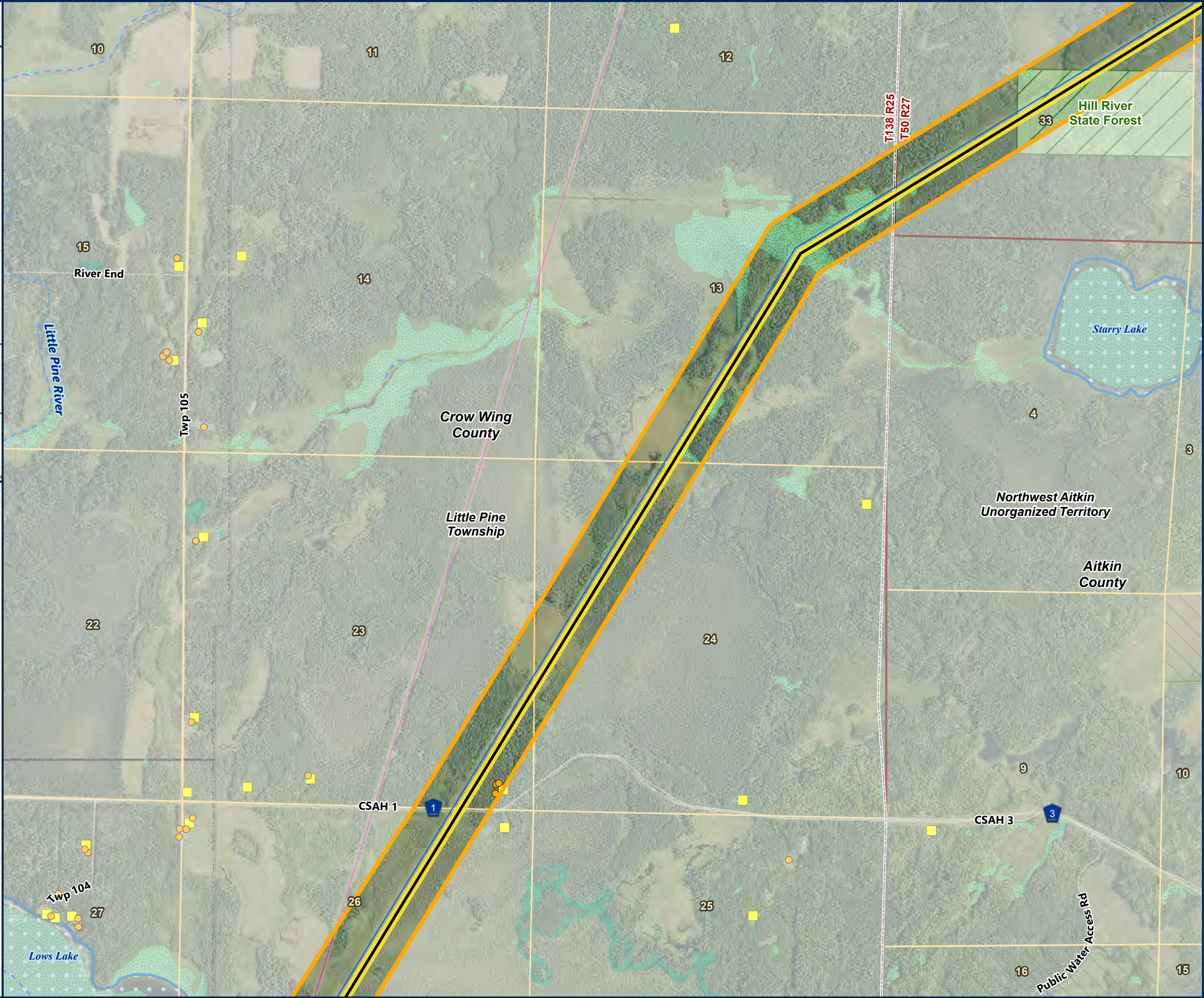
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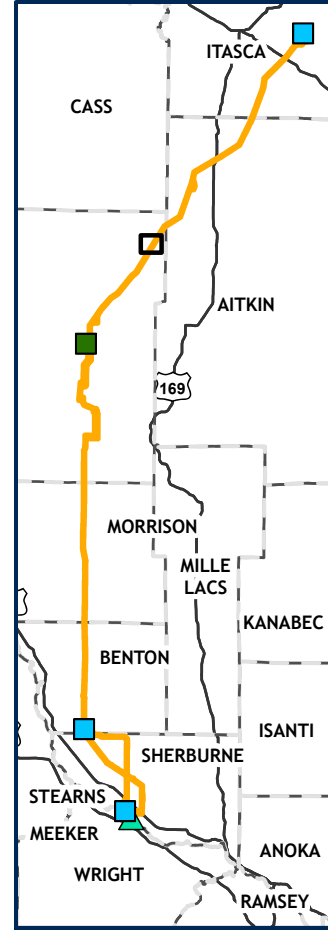
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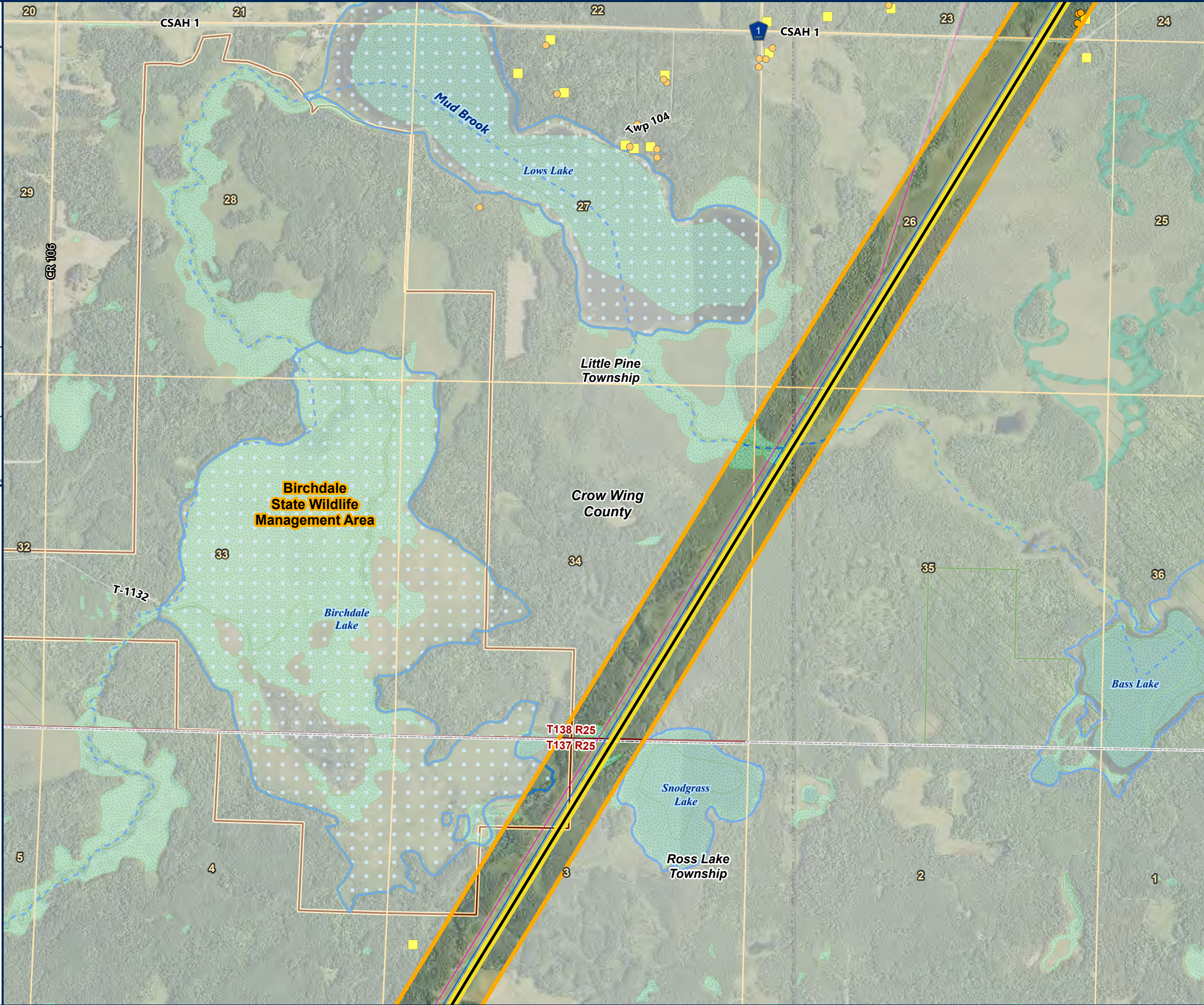
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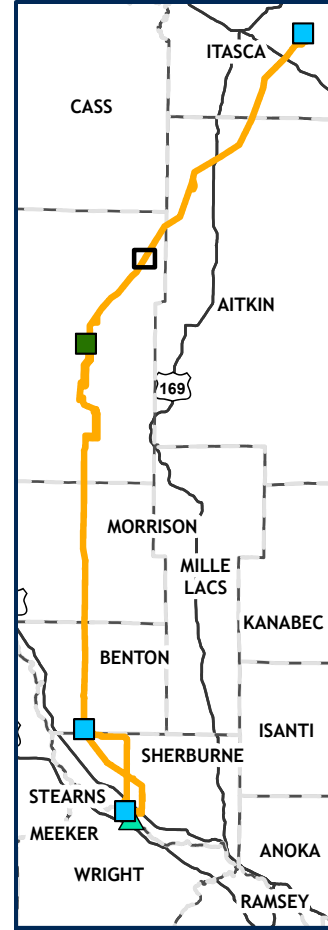


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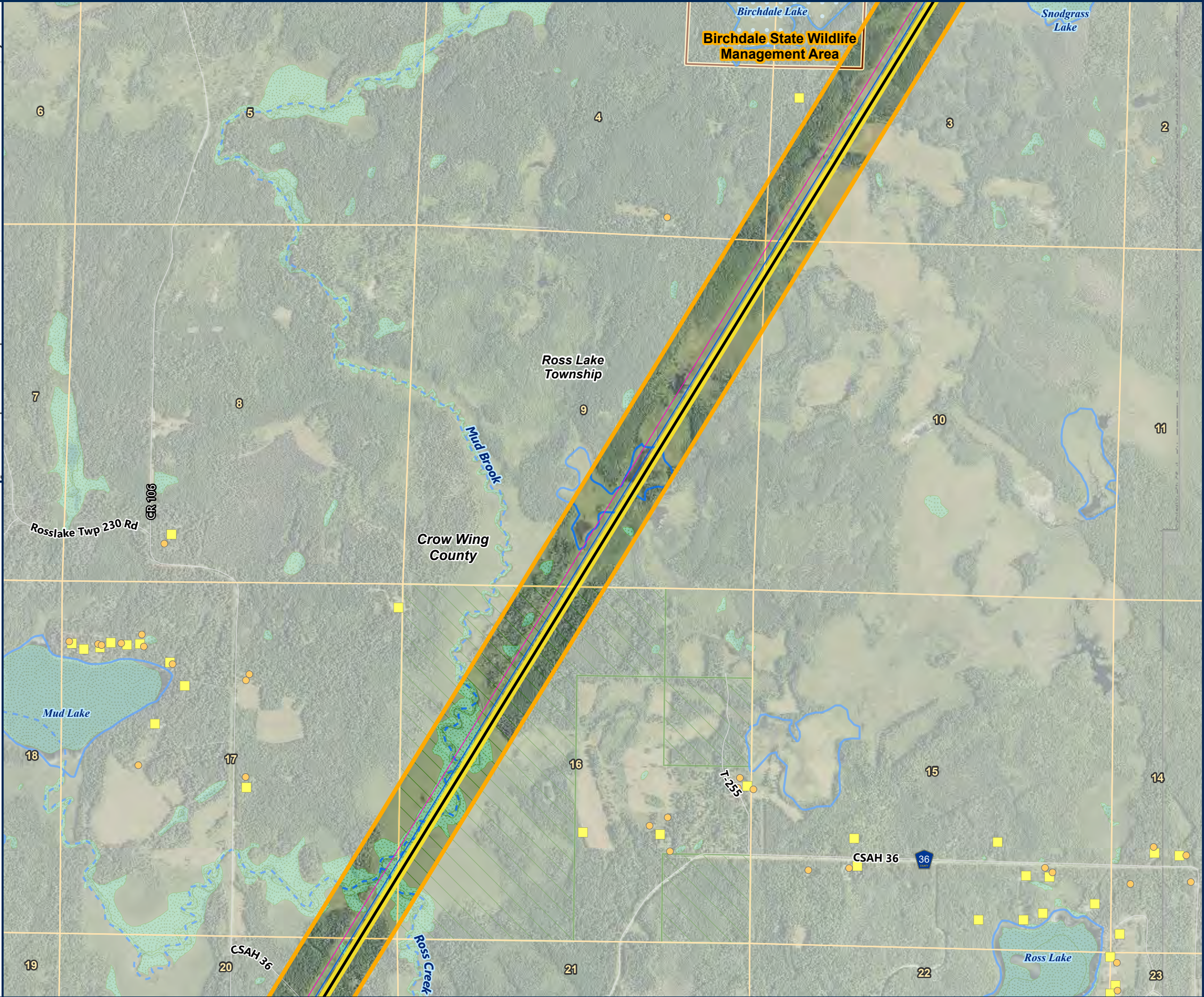


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



















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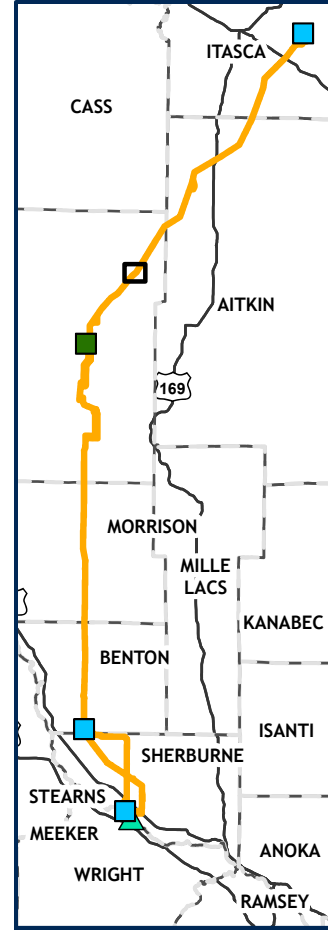
EXISTING TRANSMISSION LINE

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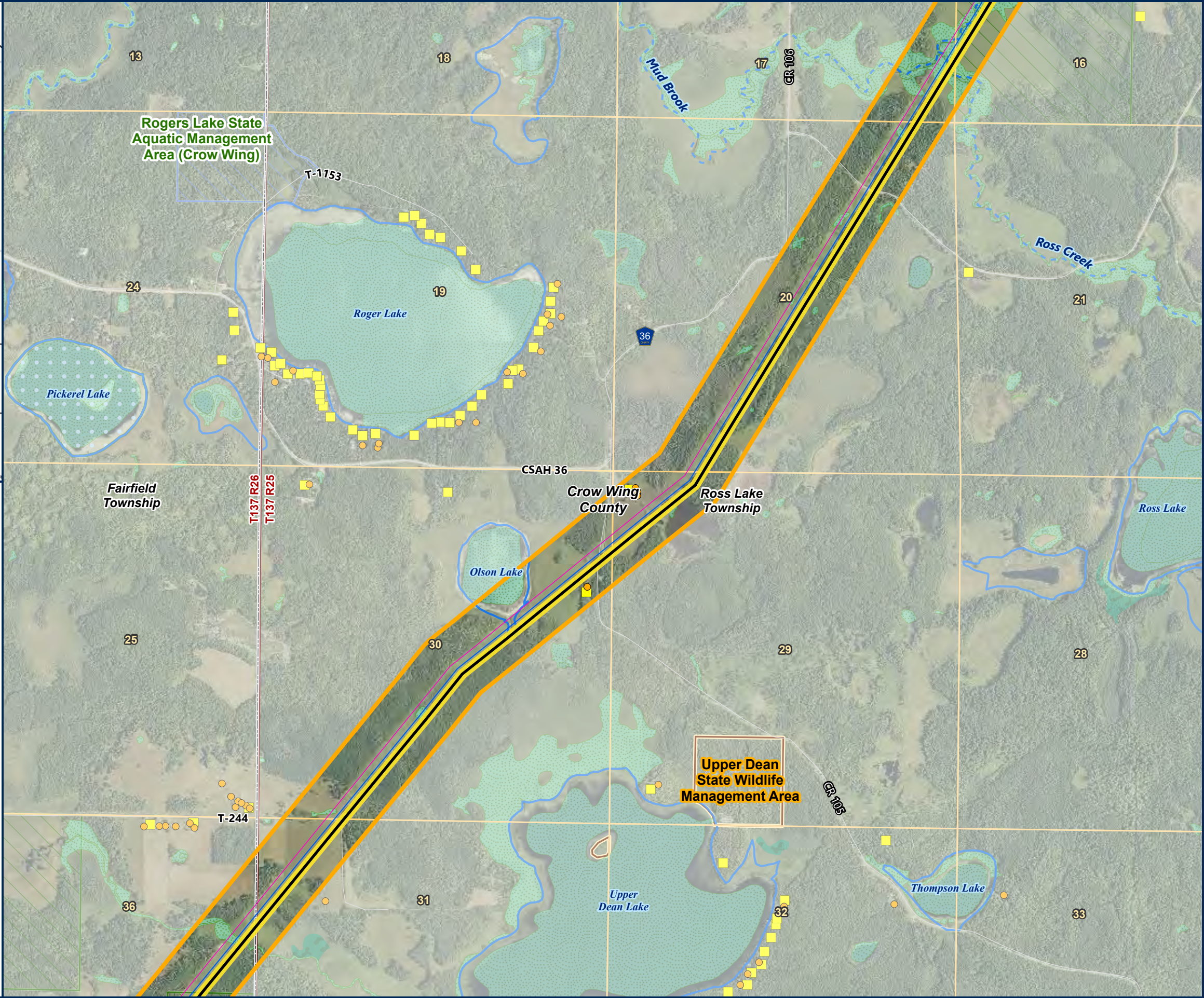



**Detailed Map
 Co-Location Maximization
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Northland Reliability Project



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EXISTING TRANSMISSION LINE

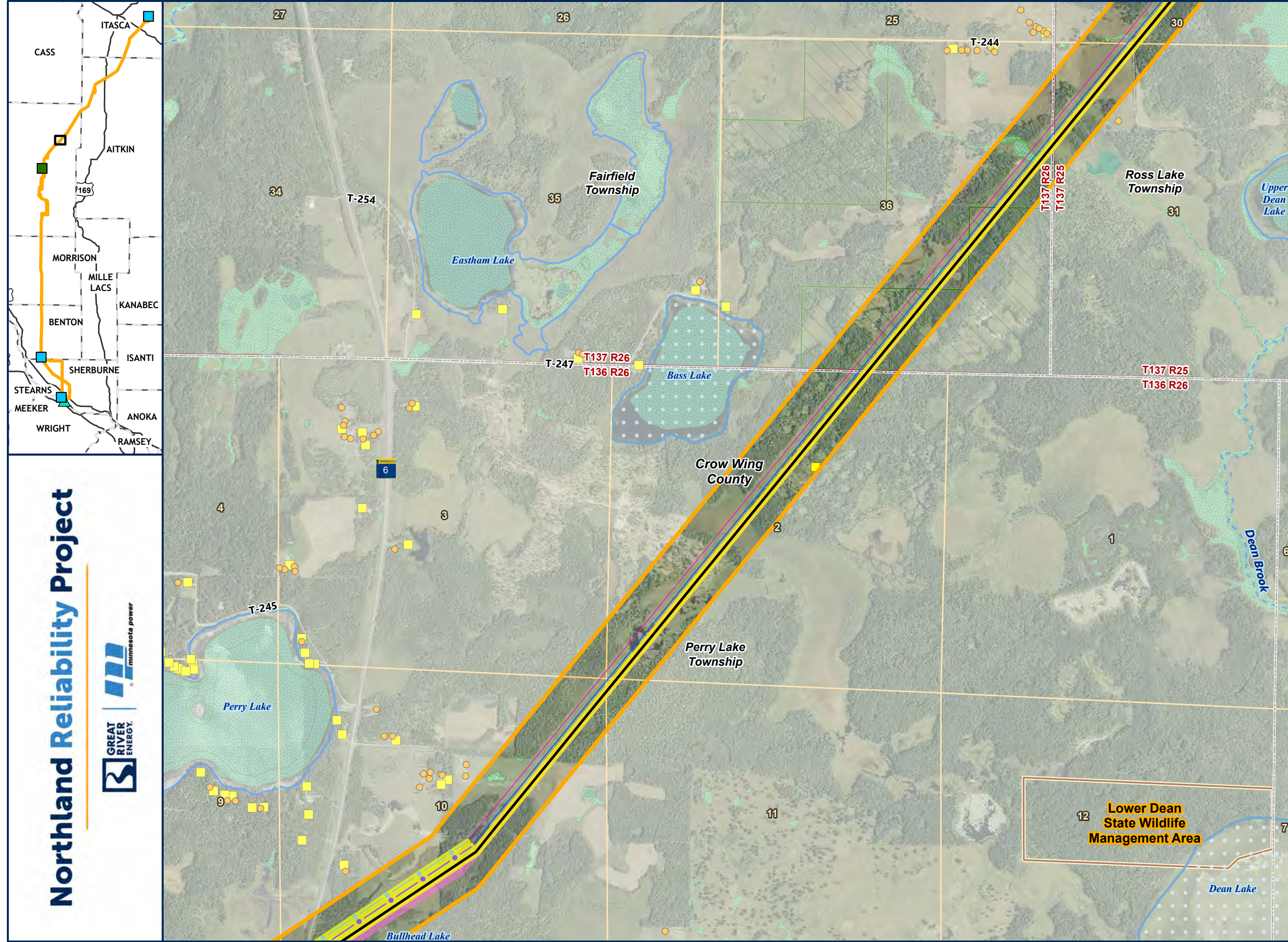
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Detailed Map
Co-Location Maximization
Route
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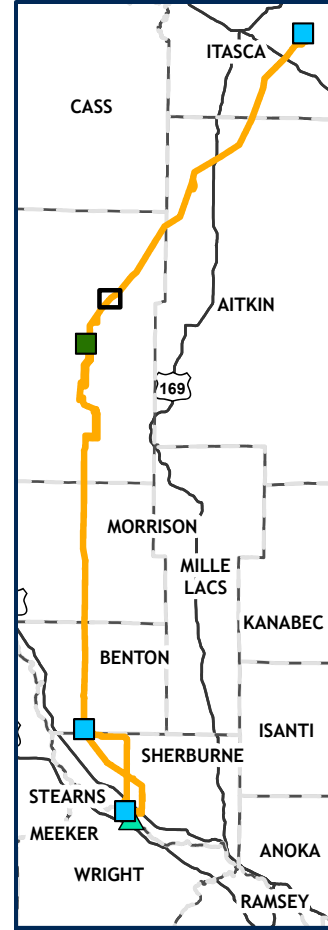



12 Lower Dean State Wildlife Management Area

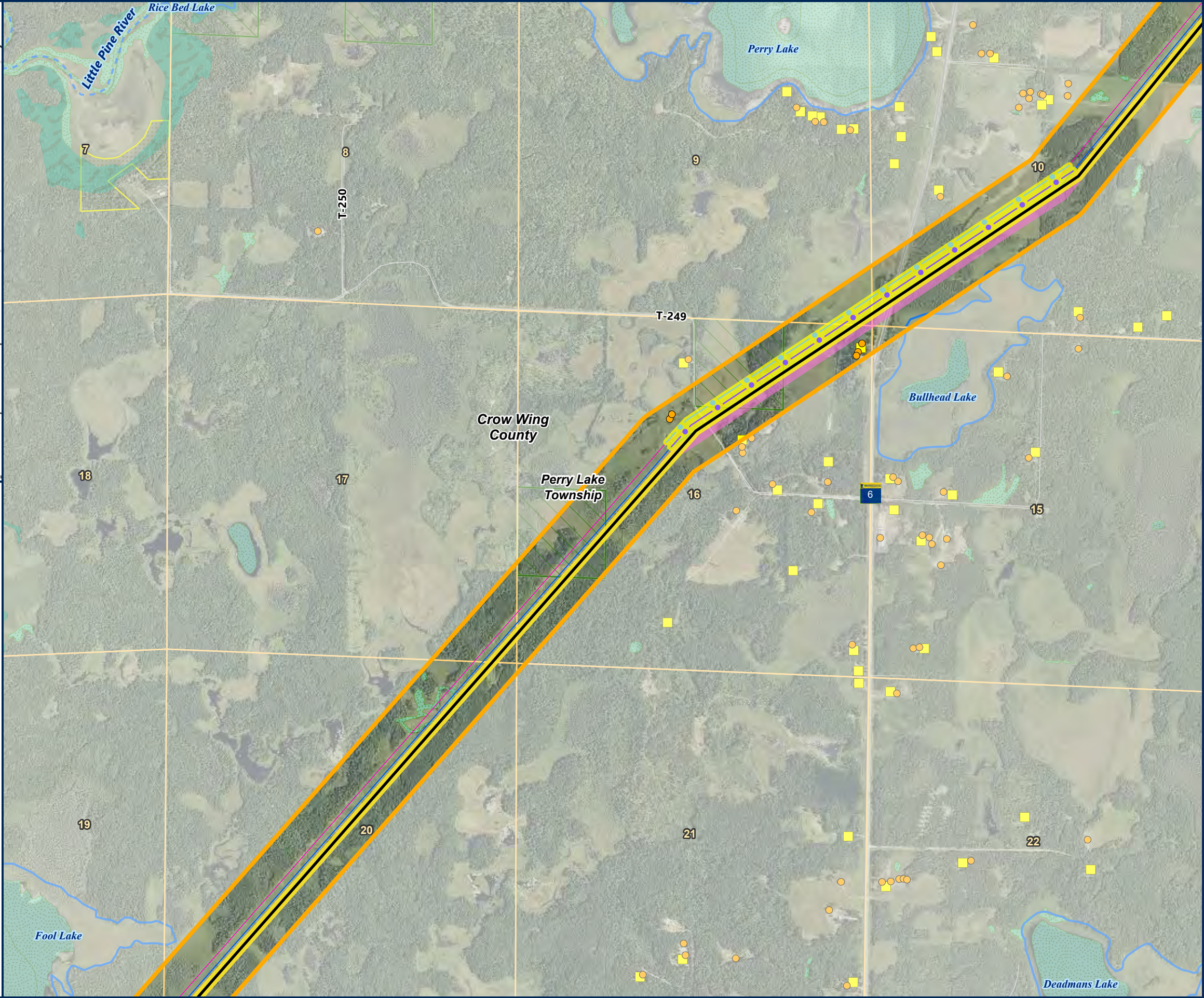


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