

9 ENVIRONMENTAL ANALYSIS OF PROPOSED ROUTE

This portion of the Application provides a description of the land use and environmental resources in the Project area, potential impacts, and proposed mitigative measures.

The name of each owner whose property is within the proposed route is provided in Appendix F.

The Project has been reviewed by a number of state and federal agencies. All environmental review correspondence related to the proposed Project is provided in Appendix G.

9.1 Environmental Setting

The Project area is dominated by forest, lakes, and wetlands, with a few areas of agricultural land. There are several communities near and along the route, including Floodwood, Gowan, and Cromwell.

The environmental setting within the Project area includes hydrologic features such as rivers, creeks, ditches, wetlands and riparian areas. A mix of groundcover is present along the proposed routes. The physiographic features (topography, soils, geology and farmland) are typical of this area and do not preclude the development of this Project. Wildlife habitat exists in pockets throughout the Project area.

Land use in the Project area includes a mix of public, residential, business, open space and agricultural lands. The residential areas within the Project area are primarily single-family homes of varying density. Open space areas include forest, wetlands and areas of cultivated land.

9.2 Impacts to Human Settlement

9.2.1 Public Health and Safety

Proper safeguards would be implemented for construction and operation of the transmission facilities. The Project will be designed in compliance with local, state, NESC and Great River Energy and Minnesota Power standards regarding clearance to the ground, clearance to crossing utilities, strength of materials and ROW widths. Construction crews and/or contract crews would comply with local, state and NESC standards regarding installation of facilities and standard construction practices. The Applicants' established safety procedures as well as industry safety procedures would be followed during and after installation of the transmission lines and switching station, including clear signage during all construction activities.

The Project would be equipped with protective devices to safeguard the public if an accident occurs and a structure or conductor falls to the ground. The existing substations are already equipped with breakers and relays located where existing transmission lines connect to the substations. The Savanna Switching Station would include these same protections. The protective equipment is designed to de-energize the transmission line should such an event occur.

The MnDOT Office of Aeronautics was contacted¹¹ requesting information on the possible effects of the proposed Project on airports or airstrips in the Project area. In an e-mail¹² dated 12/10/10 (Appendix G), MnDOT indicated that there are no public airports near the corridor, and the structures appear short enough that they would not impact navigable airspace.

The proposed Project is over 12 miles from the Moose Lake Carlton County Airport and approximately 18 miles from the Cloquet Carlton County Airport.

Impacts and Mitigation

No impacts to public health and safety are anticipated as a result of the Project. The Applicants will ensure that safety requirements are met during the construction and operation of the facilities. Additionally, when crossing roads or railroads during stringing operations, guard structures will be utilized to eliminate traffic delays and provide safeguards for the public. With implementation of these safeguards and protective measures, no additional mitigation should be needed.

9.2.2 Displacement

No homes will be within the proposed ROW, and no displacement is anticipated. Great River Energy will work with landowners to address alignment adjustments or structure placement, as necessary. It would be possible to install taller transmission line structures to meet clearances to existing structures in the ROW, place all energized conductors on one side of the transmission line structure away from the home or avoid the home completely by placing the transmission line on the other side of the road or further away than the existing transmission line.

9.2.3 Noise

Noise is measured in units of decibels on a logarithmic scale. The A weighted decibel (dBA) scale corresponds to the sensitivity range for human hearing. For example, a noise level change of 3 dBA is barely perceptible to average human hearing while a 5 dBA change in noise level is noticeable. Two sources of noise will be associated with the completed Project: conductors and substations.

Land use activities associated with residential, commercial, and industrial land are grouped together into Noise Area Classifications (NAC), Minn. Rules 7030.0050. Residences, which are typically considered sensitive to noise, are classified as NAC 1. Each NAC is assigned both daytime (7 a.m. to 10 p.m.) and nighttime (10 p.m. to 7 a.m.) limits for land use activities within the NAC. Minn. Rules 7030.0040. Table 9-1 shows the MPCA daytime and nighttime limits in dBA for each NAC. The limits are expressed as a range of permissible dBA within a 1-hour period; L50 is the dBA that may be exceeded up to 50 percent of the time within an hour, while L10 is the dBA that may be exceeded up to 10 percent of the time within 1 hour.

¹¹ Letter from Carole Schmidt, Great River Energy and Dan McCourtney, Minnesota Power to Michael Ferry, MnDOT. 12 October 2010. *See* Appendix G.

¹² Email from Michael Ferry, MnDOT Aeronautics, to Carole Schmidt, Great River Energy. 10 December 2010. *See* Appendix G.

Table 9-1 MPCA Noise Limits by Noise Area Classification (dBA)

Noise Area Classification	Daytime		Nighttime	
	L50	L10	L50	L10
1	60	65	50	55
2	65	70	65	70
3	75	80	75	80

Typical noise sensitive receptors along the route will include residences, churches, and schools; however, most of the land use along the route is rural timber, wetland or agricultural land. Current average noise levels in these areas are typically in the 30 to 40 dBA range and are considered acceptable for residential land use activities. Ambient noise in rural areas is commonly made up of rustling vegetation and infrequent vehicle pass-bys. Higher ambient noise levels, typically 50 to 60 dBA, will be expected near roadways, urban areas and commercial and industrial properties in the Project area.

The industry standard for utilities is calculated based on L₅₀ and L₅ for audible noise emissions. The worst-case scenario is when the transmission line is exposed to heavy rain conditions (one inch per hour). Anticipated levels for heavy rain conditions for a typical 115 kV line based on the results from the Bonneville Power Administration Corona and Field Effects Program version 3 (U.S. Department of Energy, Bonneville Power Administration (BPA), Undated) are listed in Table 9-2.

Table 9-2 BPA Program Results – Heavy Rain Case

L ₅	L ₅₀	Location
17.7 dBA	14.2 dBA	edge of right-of-way
18.8 dBA	15.3 dBA	directly under line

BPA has developed a general guideline based upon public response to AC transmission line audible noise. The guideline indicates that numerous complaints can be expected if the line noise exceeds approximately 58.5 dBA and that few complaints should be expected if audible noise is limited to 52.5 dBA.

Impacts and Mitigation

Noise concerns for this Project may be associated with both the construction and operation of the energy transmission system. Construction noise is expected to occur during daytime hours as the result of heavy equipment operation and increased vehicle traffic associated with the transport of construction personnel to and from the work area. Any exceedance of the MPCA noise limits will be temporary in nature.

To mitigate noise levels associated with construction activities, work will be limited to daytime hours between 7 am and 10 pm weekdays. Occasionally there may be construction outside of those hours mentioned or on a weekend if the Applicants have to work around customer schedules, line outages, or if the schedule has been significantly impacted due to other factors. Heavy equipment will also be equipped with sound attenuation devices such as mufflers to minimize the daytime noise levels.

Operational noise will be associated with the transmission conductors and transformers at substations that may produce audible noise under certain operational conditions. The level of noise depends on conductor conditions, voltage level and weather conditions.

Transmission lines can cause audible noise due to corona discharges from the conductors. This noise, which resembles a subtle crackling sound due to the small amount of electricity ionizing the moist air near the wires, is typically only within the threshold of human hearing during rainy or foggy conditions, and even then is largely imperceptible due to background noise. During light rain, dense fog, snow and other times when there is moisture in the air, the proposed transmission lines may produce audible noise higher than rural background levels. During dry weather, audible noise from transmission lines is an imperceptible, sporadic crackling sound.

Any noise from the proposed Project is expected to be well below the guidelines mentioned above and audible noise will be barely perceptible during fair weather.

The nearest residence to Lake Country Power's Cedar Valley Substation is approximately 400 feet away and there is a buffer of trees between the residence and the substation. The new 115 kV transformer will be similar in size to the existing 69 kV transformer it will replace, and there should be no perceptible changes in noise at the substation.

The nearest residence to the proposed Savanna Switching Station is approximately 1,100 feet away, and the site is shielded by existing wooded vegetation. There will be no transformer at the switching station and construction and operation of the proposed switching station will have negligible impact on the surrounding residences.

The nearest residence to Great River Energy's Cromwell Substation is approximately 500 feet away. The substation is also shielded by existing wooded vegetation and modifying the substation to accommodate the 115 kV transmission line will not result in perceptible changes in noise for the residences.

Operational noise levels are not predicted to exceed the state noise limits and therefore no mitigation is required.

9.2.4 Aesthetics

In general, aesthetic impacts are dependent on the response of the viewer. Viewer response is based on the sensitivity and exposure of the viewer to a particular viewshed. Sensitivity relates to the magnitude of the viewer's concern for the viewshed, while exposure is a function of the type, distance, perspective and duration of the view.

This Project is a rebuild and change in voltage level of existing lines located along existing utility ROW from the Cedar Valley Substation to the Cromwell Substation. The Project follows paved state and local highways and two-lane county roads that are mostly local and rural in character. None of these roadways are designated as Scenic Byways.

Impacts and Mitigation

Aesthetic impacts are expected to be minimal because the proposed Project is a rebuild of existing lines between Cedar Valley and Gowan substations and the conversion from single to double circuit between the Gowan and Cromwell substations. The proposed Project will result in minimal perceptible changes to the viewshed, as the proposed structures will be similar to, but somewhat taller (10-30 feet) than, the existing structures along the route. The existing structures are 50-55 feet tall and the new structures will be approximately 60-85 feet tall. The structures proposed for the rebuild will have a narrow profile that is designed to be less intrusive than other types of structures.

The proposed transmission line will cross the St. Louis River in two different locations. Crossing the St. Louis River will not perceptibly change the existing viewshed of the area because the proposed route will follow the existing transmission line ROW. The potential aesthetic impact resulting from new, somewhat taller, structures will be imperceptible to most viewers.

Figure 9-1 shows the existing structures at the St. Louis River crossing north of Gowan. Figure 2 shows a photosimulation of the proposed structures at this same location.

Figure 9-1 Existing Structures at St. Louis River Crossing



Figure 9-2 Proposed Structures at St. Louis River Crossing



The route (300 feet wide, 150 feet either side of transmission line centerline) for which the Applicants have applied is shown on the detailed maps in Appendix D. There are three homes within 50 feet either side of the existing transmission line centerline, three homes between 50 and 75 feet either side of the existing transmission line centerline, four homes between 75 and 100 feet either side of the existing transmission line centerline, and 24 homes between 100 and 150 feet either side of the existing transmission line centerline. There is one public gathering place (church) within 50 feet of the existing transmission line centerline.

Landowners have been and will be consulted to identify concerns related to the transmission line, any potential substation expansion, and aesthetics. In general, mitigation includes enhancing positive effects as well as minimizing or eliminating negative effects. Potential mitigation measures include:

- Location of structures, ROW and other disturbed areas will be determined by considering input from landowners or land management agencies to minimize visual impacts.
- Care shall be used to preserve the natural landscape; construction and operation shall be conducted to prevent any unnecessary destruction, scarring or defacing of the natural surroundings in the vicinity of the work.
- Landowners will be compensated for the removal of trees and vegetation, either through easement negotiations or on a separate basis.
- Structures will be placed at the maximum feasible distance from highway, trail and water crossings, within limits of structure design.
- To the extent practicable, rivers shall be crossed in the same location as existing transmission lines.

9.2.5 Socioeconomic

The Project is located within both St. Louis and Carlton counties in northeastern Minnesota.

The socioeconomic setting of the proposed Project area was evaluated on a regional basis, comparing data for the area along the Project route with average data for St. Louis and Carlton counties and the state of Minnesota. Data were compiled from the 2009 and 1990 U.S. Census. Table 9-3 summarizes the socioeconomic characteristics within the Project area.

Table 9-3 Socioeconomic Characteristics within the Project Area

LOCATION	POPULATION 1990	POPULATION 2009	CHANGE (%)	PER CAPITA INCOME	POPULATION BELOW POVERTY LEVEL (%)
State of Minnesota	4,375,099	5,266,214	16.9%	\$30,090	9.7
St. Louis County	198,213	197,767	0.0%	\$18,982	12.4
Carlton County	29,259	34,327	14.7%	\$18,073	12.4
Cedar Valley Township, St. Louis County	210	249	15.6%	\$16,569	12.4
Van Buren Township, St. Louis County	178	179	0.0%	\$16,509	12.4
Floodwood Township, St. Louis County	345	306	-11.3%	\$17,805	12.4
Fine Lakes Township, St. Louis County	150	142	-5.3%	\$16,015	12.4
Eagle Township, Carlton County	529	603	12.2%	\$19,078	12.4
Kalevala Township, Carlton County	285	342	16.6%	\$19,254	12.4
Cromwell	221	203	-8.1%	\$16,605	12.4

Impacts and Mitigation

Rebuilding the existing utility lines will result in some minor short and long term economic impacts for the surrounding communities. Long term benefits will result from the new utility infrastructure and will include improved utility service, which supports local economies.

Increasing the transmission outlet capability within the Project area will benefit the surrounding communities in general. Upgrading the utility lines will serve the growing demand of the region. Although St. Louis County has recently experienced no population growth, Carlton County is growing.

Short term impacts will result from the activities associated with construction. Impacts to social services would be unlikely because of the short-term nature of the construction project. In the short-term, revenue would likely increase for some local businesses, such as hotels, restaurants, gas stations and grocery stores, due to workers associated with construction of the Project.

Because impacts to socioeconomics will be generally short-term and beneficial, no mitigation is necessary or proposed.

9.2.6 Cultural Values

Cultural values include those perceived community beliefs or attitudes in a given area that provide a framework for that community's unity. The communities in the vicinity of the Project appear to have cultural values corresponding with the economic activities of the region (logging, rural agriculture, light industry, recreation and tourism). Values within the region include individualism, loyalty to local businesses and service providers, and appreciation of natural resources.

Historically, the railroads that cross the region were important for gathering goods and transporting them to markets. Logging and farm-related business remain central to the regional economy. The area has a diversified mix of forest product markets, livestock and crops.

Impacts and Mitigation

The construction of the proposed transmission facilities will provide the region with a stable power supply. As the urban centers of the northeastern Minnesota region continue to grow and the diverse economic base continues to expand, the available power supplied by upgraded and additional facilities will provide essential support and contribute to a stable economic environment in which to live and work. In addition, opportunities presented by the diverse economy may continue to encourage civic pride, and tourism may benefit from this unity as well.

Because no adverse impacts to cultural values are anticipated, no mitigation is necessary or proposed.

9.2.7 Recreation

There are many existing recreational resources within the Project vicinity, including parks, trails, rivers, and museums. Popular activities include camping, fishing, hunting, bird watching, canoeing, boating, swimming, biking, hiking, and riding ATVs and snowmobiles. DNR Scientific and Natural Areas (SNAs) as well as state and county forests provide opportunities for viewing wildlife and intact ecosystems.

Recreational resources in the vicinity of the Project are listed in Table 9-4 and those near the Project are shown on Figures 9-3a to 9-3e. State resources that are a considerable distance from the proposed route (many of the Wildlife Management Areas (WMAs) and the SNA) are shown on Figure 3-1.

Table 9-4 Recreational Resources in the Project Vicinity

Location	Resource
State	St. Louis River Savanna State Forest Fond Du Lac State Forest Wawina Peatland SNA Floodwood WMA Ricehaven WMA Carl Sandell WMA Mervin WMA Kettle Lake WMA
County/Regional	Island Lake County Park Carlton County Memorial Forest Snowmobile Trails

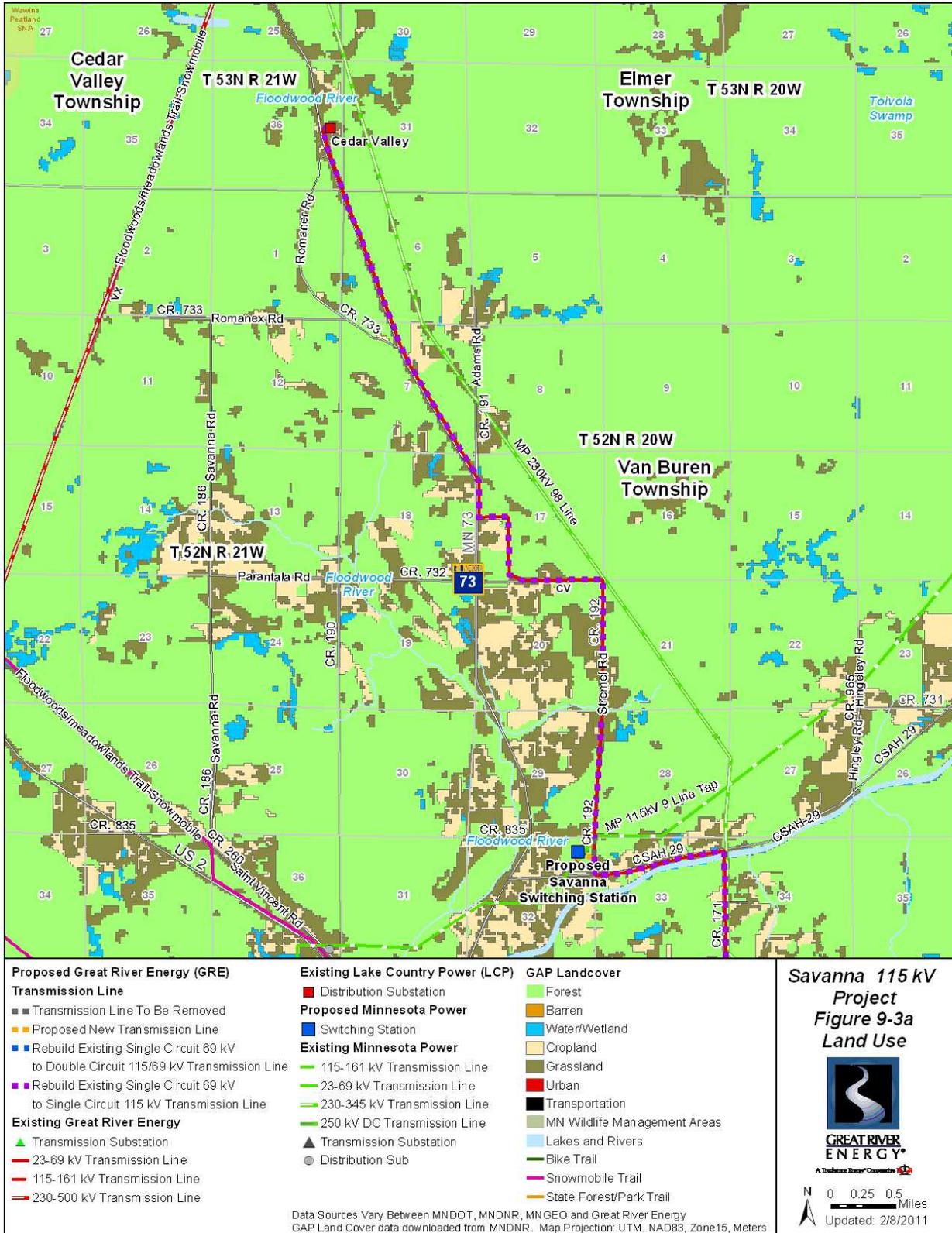
Impacts and Mitigation

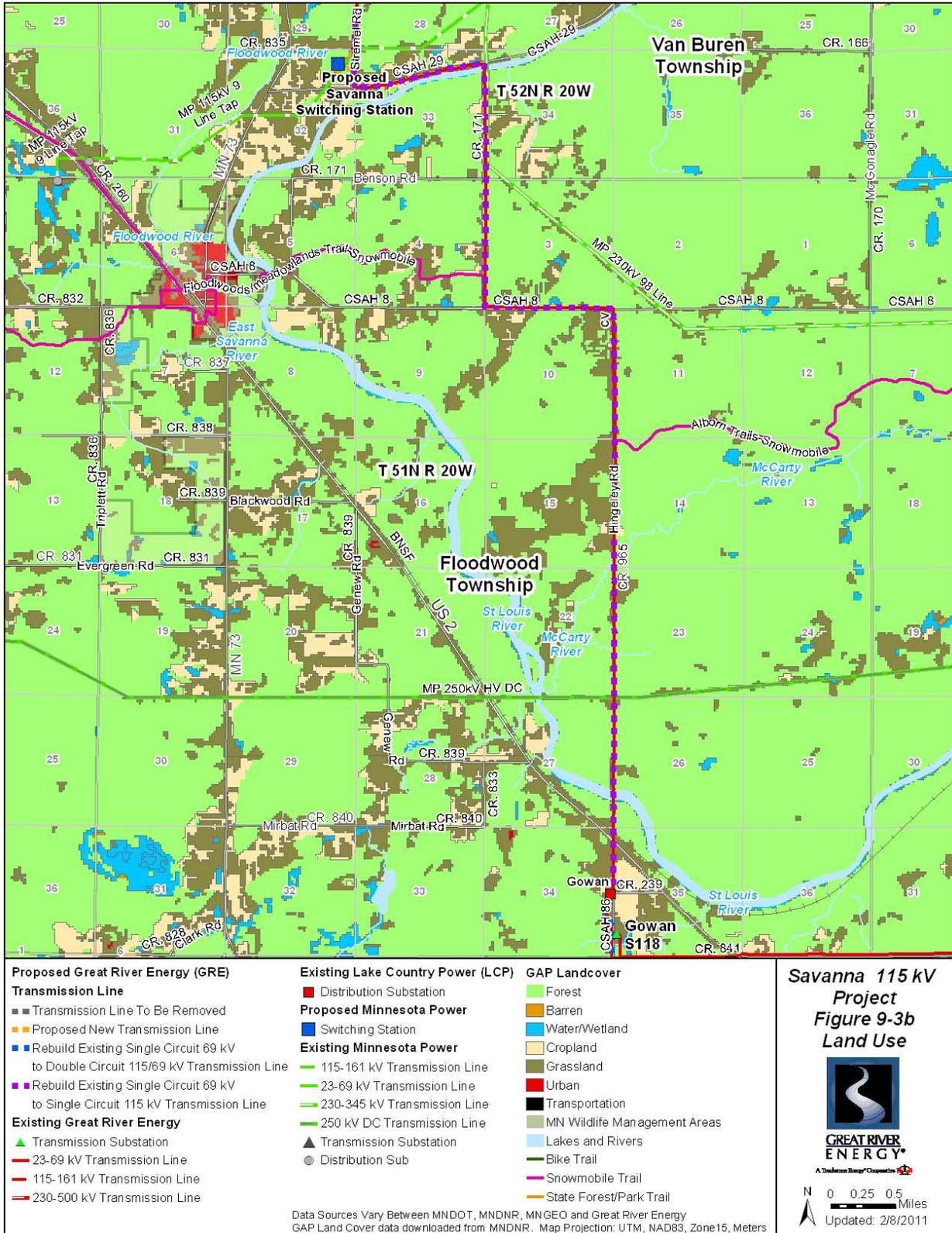
Because the proposed transmission line project is an upgrade to an existing line, there will be little additional impact on recreation. The transmission line crosses the St. Louis River, but does not cross state forest lands, SNAs or any WMAs.

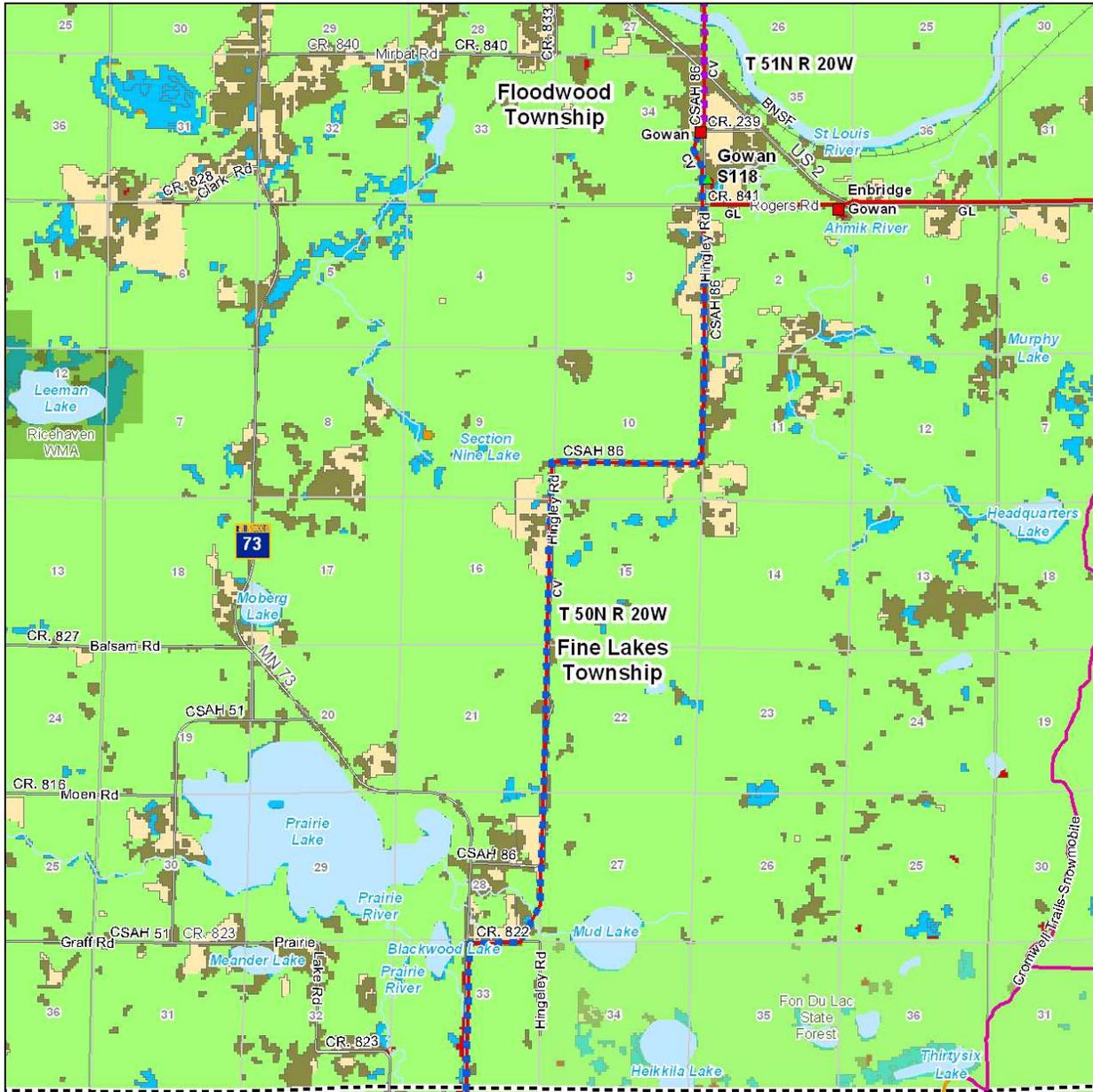
However, where rebuilt lines are constructed, the visual setting for people biking, hiking, boating or birding near the new lines may be slightly affected. It is also possible that clearing vegetation underneath the utility lines will decrease the wildlife habitat within the immediate vicinity, potentially impacting viewing opportunities for the short term. Again, because there is an existing line in place, vegetation clearing will be limited.

The proposed route crosses snowmobile trails in both St. Louis and Carlton counties. The trails are located within Van Buren Township in St. Louis County and Red Clover Township in Carlton County. The proposed transmission line will likely stay within the same ROW corridor, therefore it will not significantly affect the visual field of snowmobilers. This recreational use will not be impacted by the proposed Project.

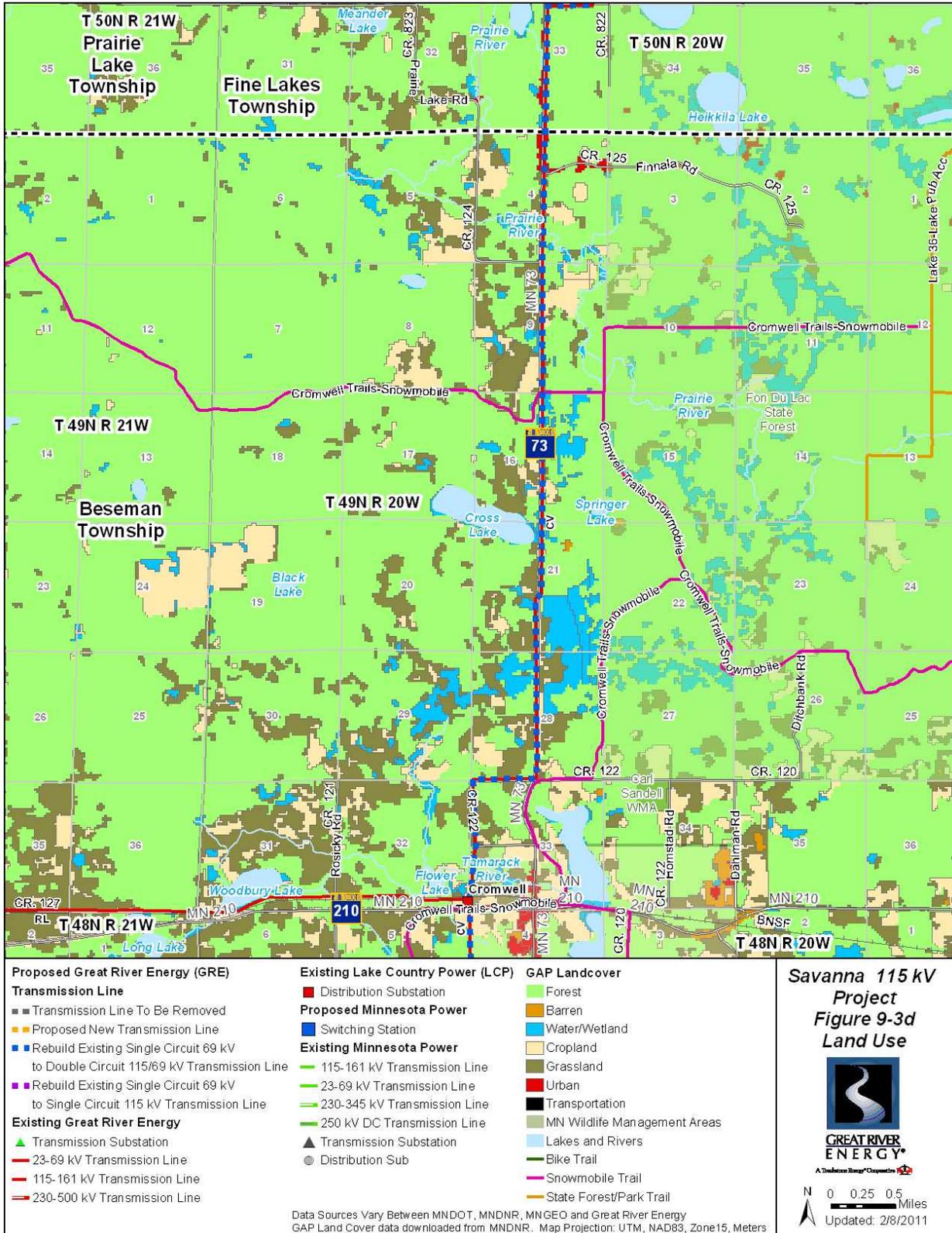
Rebuilding the existing utility line along an existing transmission ROW will minimize any additional impacts to recreational resources. Because structures will be placed within existing utility ROW, impacts to previously undisturbed parks or management areas is unlikely. Permanent disturbance of wildlife habitat will also be minimized, to avoid impacts to hunting and wildlife observation.

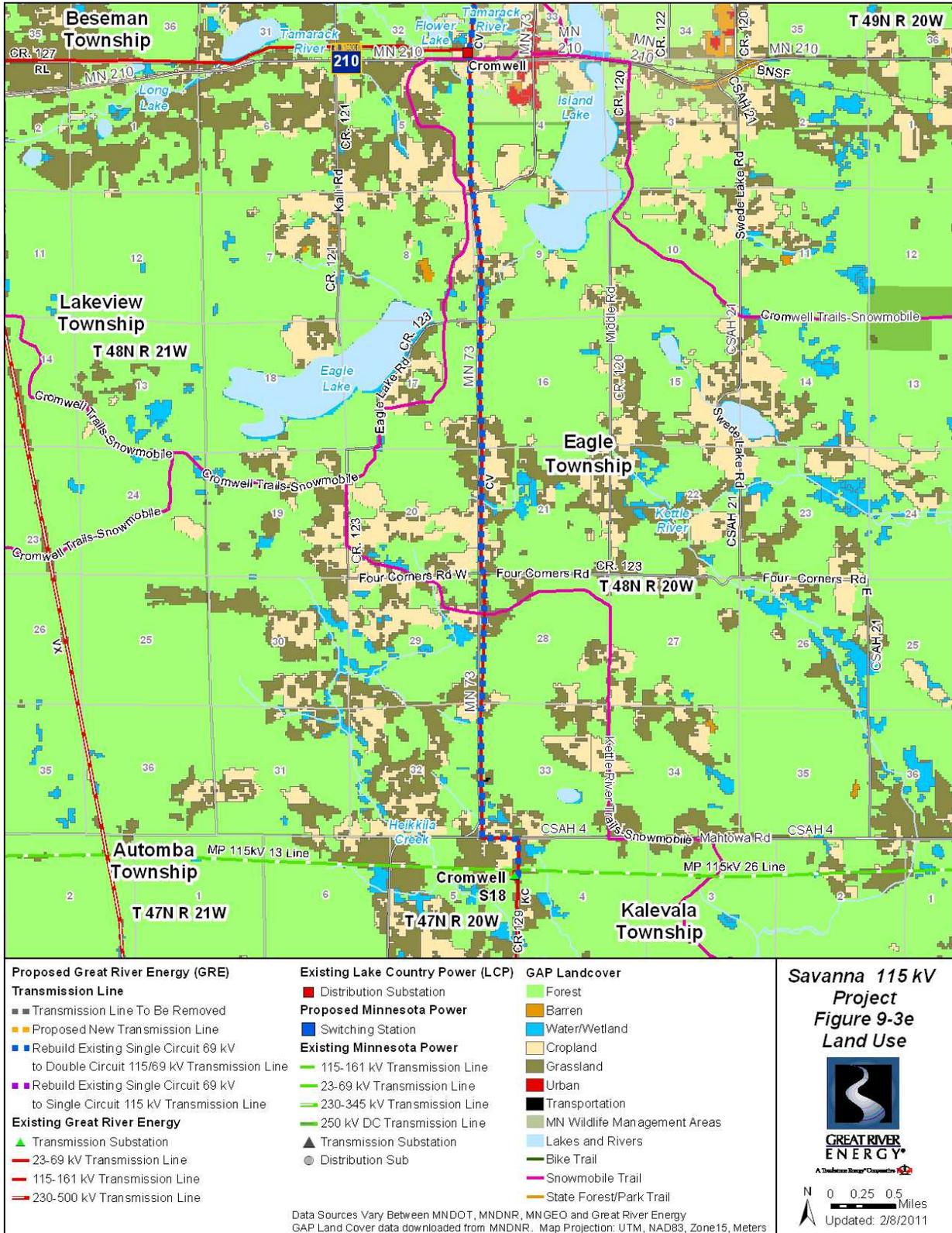






<p>Proposed Great River Energy (GRE) Transmission Line</p> <ul style="list-style-type: none"> Transmission Line To Be Removed Proposed New Transmission Line Rebuild Existing Single Circuit 69 kV to Double Circuit 115/69 kV Transmission Line Rebuild Existing Single Circuit 69 kV to Single Circuit 115 kV Transmission Line <p>Existing Great River Energy</p> <ul style="list-style-type: none"> Transmission Substation 23-69 kV Transmission Line 115-161 kV Transmission Line 230-500 kV Transmission Line 	<p>Existing Lake Country Power (LCP)</p> <ul style="list-style-type: none"> Distribution Substation <p>Proposed Minnesota Power</p> <ul style="list-style-type: none"> Switching Station <p>Existing Minnesota Power</p> <ul style="list-style-type: none"> 115-161 kV Transmission Line 23-69 kV Transmission Line 230-345 kV Transmission Line 250 kV DC Transmission Line Transmission Substation Distribution Sub 	<p>GAP Landcover</p> <ul style="list-style-type: none"> Forest Barren Water/Wetland Cropland Grassland Urban Transportation MN Wildlife Management Areas Lakes and Rivers Bike Trail Snowmobile Trail State Forest/Park Trail 	<p>Savanna 115 kV Project Figure 9-3c Land Use</p>  <p>GREAT RIVER ENERGY <small>A Thacker-Hughes Company</small></p> <p>N 0 0.25 0.5 Miles Updated: 2/8/2011</p> <p><small>Data Sources Vary Between MNDOT, MNDNR, MN GEO and Great River Energy GAP Land Cover data downloaded from MNDNR. Map Projection: UTM, NAD83, Zone15, Meters</small></p>
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The Project will involve two crossings of the St. Louis River. Utility lines are already part of this landscape, and because the existing transmission line will be rebuilt within the same ROW, the recreational uses of these resources will not be affected. No significant changes to the visual setting or recreational uses for people using this section of the river are expected. The Applicants will coordinate with the DNR to ensure utility line construction will not impact the surrounding natural resources.

No impacts to local recreational resources such as the golf courses, museums, city parks, or campgrounds, are expected.

Because no impacts to recreation are anticipated, no mitigation is necessary or proposed.

9.2.8 Public Services

The Project generally runs through rural areas with typical public services (police, fire protection, waste collection, natural gas, wells, septic systems, cable television, electricity, telephone, etc.).

Impacts and Mitigation

Because the route follows existing transmission line ROW, no impacts to public services are anticipated and therefore no mitigation is necessary.

9.2.9 Transportation

The transportation network that may be used to develop and operate this Project is comprised of various county, trunk and U.S. highways. Few urban areas exist within the Project area. Two active BNSF Railway Company railroad lines are present within the Project area (Figures 9-3b and 9-3d).

In general, the proposed route is located in rural areas served by highways and county roads with relatively low traffic volume. Therefore, congestion is not a primary factor on any of the roadways along the route.

Temporary and permanent licenses for both construction and utility line operation would be required from the BNSF. Construction activities would be regulated by the carrier and any disruptions to rail service would require approval by the carrier.

Temporary access for the rebuild of transmission lines along the route would be along the existing transmission line ROW or by short spur trails from the existing road network to the ROW. Temporary guard structures would be used to string conductor over existing roads and railroads. The structures typically consist of directly-imbedded poles with a horizontal cross piece to support the conductor at sufficient height above traffic. Temporary traffic impacts associated with equipment are material delivery and worker transportation.

Impacts and Mitigation

Access to modify the existing substations and the newly constructed substation would be from existing roads and would only cause minor and temporary disruption to traffic. Given the small number of workers and construction vehicles, traffic disruptions would be minimal and localized.

A review of county highway capital improvement plans showed no major road work along the route. General upkeep of the roads along the route will take place.

Short-term localized traffic delays are anticipated. The impacts resulting from construction and operation of the proposed transmission lines and modifications to substations would be minimal for transportation.

During transmission line and substation modification/construction activities, delays to railroad operations due to construction vehicles or equipment crossing tracks will be avoided. Construction will be coordinated with railroad operators.

When appropriate, pilot vehicles will accompany the movement of heavy equipment. Traffic control barriers and warning devices will be used when appropriate. All necessary provisions will be made to conform to safety requirements for maintaining the flow of public traffic. Construction operations will be conducted to offer the least possible obstruction and inconvenience to the traveling public. The construction contractor would be required to plan and execute delivery of heavy equipment in such a manner that would avoid traffic congestion and reduce likelihood of dangerous situations along local roadways.

9.3 Impacts on Land-based Economies

9.3.1 Agriculture

The transmission line would cross approximately 5.7 miles of agricultural land. Some agricultural land will be temporarily removed from production during transmission line construction, but permanent agricultural land conversion associated with the transmission line poles will be minimal. Landowner compensation will be established by individual easement agreements. In general, agricultural areas surrounding transmission line poles can still be farmed. Because the proposed transmission line is along an existing route, impacts will be limited to the existing utility corridor. Project construction will not cause additional impacts to leading industries within the Project area.

The U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) defines prime farmland soils as having:

“...the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oilseed crops...” is “...an adequate and dependable water supply from precipitation or irrigation. They have a favorable temperature and growing season with acceptable levels of acidity or alkalinity, content of salt or sodium, and few or no rocks. They are permeable to water and air, are not excessively erodible and are not saturated with water for long periods of time. They do not flood frequently or are protected from flooding (7 C.F.R. § 657).”

Soils listed as farmland of statewide importance are defined as:

“...those that are nearly prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some may produce as high a yield as prime farmlands if conditions are favorable (7 C.F.R. § 657).”

Impacts and Mitigation

There is no prime farmland along the proposed route. Farmland along the proposed route consists mainly of hay fields. Because the Project is a transmission line rebuild, impacts to agriculture will be minimized.

The Project will result in permanent and temporary impacts to agricultural land. Permanent impacts will occur as a result of structure placement along the route centerline. The area of impact will be the footprint of the pole itself and the area immediately surrounding the pole (approximately 30 square feet), although the majority of the ROW easement will be available for agricultural cultivation.

During construction, temporary impacts, such as soil compaction and crop damages within the ROW, are likely to occur.

The Applicants will work with landowners to minimize impacts to all farming operations along the route, and will compensate landowners for any crop damage and soil compaction that may occur during construction. Areas disturbed during construction will be repaired and restored to pre-construction contours as required so that all surfaces drain naturally, blend with the natural terrain and are left in a condition that will facilitate natural revegetation, provide for proper drainage and prevent erosion.

Specific mitigation measures to be implemented include:

- Movement of crews and equipment will be limited to the ROW to the greatest extent possible, including access to the route. Contractors employed by the Applicants will limit movement on the ROW to minimize damage to grazing land, crops, or property. If movement outside of the ROW is necessary during construction, permission will be obtained and any crop damage will be paid to the landowner.
- When weather and ground conditions permit, deep ruts that are hazardous to farming operations will be repaired or compensation will be provided as an alternative if the landowner desires. Such ruts will be leveled, filled and graded or otherwise eliminated in an approved manner. In hay meadows, alfalfa fields, pastures and cultivated productive lands, compacted soils will be loosened and ruts will be leveled by scarifying, harrowing, disking, or by other approved methods. Damage to ditches, tile drains, terraces, roads and other features of the land will be corrected using approved methods and indigenous plants where necessary. The land and facilities will be restored as nearly as practicable to their original conditions.

- ROW easements will be purchased through negotiations with each landowner affected by the Project. Restoration or compensation will subsequently be made for reasonable crop damages or other property damage that occurs during construction or maintenance as negotiated.
- Construction will be scheduled during periods when agricultural activities will be minimally affected to the extent possible or the landowner will be compensated accordingly.
- Fences, gates and similar improvements that are removed or damaged will be promptly repaired or replaced.

Some temporary construction space will be needed for the Project. For temporary marshalling yards, which will provide space to store material and equipment, the Applicants will lease the space by agreement with the respective landowner(s), remove and properly dispose of all material and debris, and repair all damages and perform restoration, as necessary. It is anticipated that minimal temporary construction space on property immediately adjacent to the ROW and on private property will be needed, with the exception of limited equipment access.

9.3.2 Forestry

St. Louis County is heavily forested. Approximately 72% of Carlton County is forested and public agencies manage just under half of these forested lands. The proposed transmission line crosses wooded areas, some of which are privately-owned woodlots and shelterbelts. The transmission line would cross approximately 5.6 miles of upland forested land.

Impacts and Mitigation

The forest resources located along the proposed route alignment will not be significantly affected from a composition or economic standpoint. Because the proposed route follows an existing transmission line, additional forest impacts due to additional ROW acquisition and subsequent clearing will be minimal. Clearing of the ROW in forested areas will be limited to the amount necessary to permit the safe and reliable operation of the transmission line.

Mitigation measures for potential impacts to forest resources would be as follows:

- Clearing for access to the ROW that is necessary for passage of construction equipment will be limited to only those trees necessary.
- Vegetation within these temporary access points will be restored.
- Native shrubs that will not interfere with the safe operation of the transmission line will be allowed to reestablish in the ROW.
- Great River Energy will replace or compensate for windbreaks as determined through negotiations with individual landowners.

9.3.3 Tourism

Tourist destinations within the Project vicinity include state and county memorial forests, trails, rivers, State WMAs and State SNAs. Popular activities include camping, fishing, hunting, bird watching, canoeing, boating, swimming, biking, hiking, riding ATVs and snowmobiles. The WMAs, SNAs, and state and county forests within the Project area provide opportunities for viewing wildlife and intact ecosystems. Historic areas provide the chance to learn about the regional and local history.

Impacts and Mitigation

No impacts on tourism are expected, therefore no mitigation is necessary.

9.3.4 Mining

Notable mining resources in the area include sands and gravels present in glacial outwash deposits. There are both active and inactive gravel pits located throughout the Project area. The borrow pits size range anywhere from five acres to larger than 15 acres.

Impacts and Mitigation

Based on a review of available pit maps for St. Louis and Carlton counties, the Project would not pose any additional impacts to active mining or quarrying operations. Therefore, no mitigation would be necessary.

9.4 Archaeological and Historic Resources

A cultural resource literature review of the proposed transmission line rebuild, proposed substation and a one-mile buffer was conducted at the Office of the State Archaeologist located at Fort Snelling in St. Paul, Minnesota, and at the Minnesota State Historic Preservation Office (SHPO) located at the Minnesota History Center in St. Paul, Minnesota. Historic property location maps, site forms, and survey reports were among the sources consulted. Sources examined included the historic Trygg maps, the Andreas' Illustrated Atlas of Minnesota, 1874 and archaeological site files.

The archaeological site files were examined to obtain a list of all previously recorded archaeological sites in the vicinity of the Project (Table 9-5). Multiple historic structures have been inventoried within the one-mile Project buffer, most of which have been determined as not eligible for listing on the National Register of Historic Places (NRHP) or have not been evaluated for listing,

One archaeological site, an artifact scatter with associated structural ruins, is located in Floodwood Township in St. Louis County. The historic Trygg maps identify several historic trails and roads in the general Project area.

Table 9-5 Architectural and Archaeological Sites in the Vicinity of the Project

SHPO Number	Archaeology/Historic	Township	Range	Section	Quarter Sections
CL-CRO-007	Historic	49	20	33	SE-SE-SW
CL-CRO-002	Historic	49	20	33	NW-SW-SE
CL-CRO-001	Historic	49	20	33	SW-SW-SE
CL-CRO-020	Historic	48	20	4	NW-SE
CL-CRO-019	Historic	48	20	4	SW-NE
CL-CRO-016	Historic	48	20	4	NW-NE
CL-CRO-017	Historic	48	20	4	NW-NE
CL-CRO-015	Historic	48	20	4	NW-NE
CL-CRO-012	Historic	48	20	4	SE-SW
CL-CRO-013	Historic	48	20	4	SE-NW
CL-CRO-014	Historic	48	20	4	NW-NE
CL-CRO-018	Historic	48	20	4	NW-NE
CL-CRO-009	Historic	48	20	4	NE-NE-NW
CL-CRO-010	Historic	48	20	4	NW-NE-NE
CL-CRO-003	Historic	48	20	4	SW-NE
CL-CRO-008	Historic	48	20	4	NW-NW-NE
CL-EAG-008	Historic	48	20	8	NE-SE
CL-EAG-009	Historic	48	20	8	SE-NE
CL-EAG-010	Historic	48	20	16	NW-NW
CL-EAG-007	Historic	48	20	17	SE-SE
CL-EAG-006	Historic	48	20	20	NE-NE
CL-EAG-005	Historic	48	20	20	SE-SE
CL-EAG-013	Historic	48	20	21	NW-SW
CL-EAG-012	Historic	48	20	21	NW-SW
CL-EAG-011	Historic	48	20	21	NW-NW
CL-EAG-014	Historic	48	20	28	NW-NW
CL-EAG-015	Historic	48	20	28	SW-NW
CL-EAG-016	Historic	48	20	28	NW
CL-EAG-001	Historic	48	20	28	SW-SW-SW
CL-EAG-004	Historic	48	20	29	SE-NE
CL-EAG-004	Historic	48	20	29	SE-NE
CL-EAG-003	Historic	48	20	32	SE-SE
CL-CRO-011	Historic	48	20	33	SE-SW-SE
CL-EAG-002	Historic	48	20	33	NW-NW-NW
CL-CRO-005	Historic	48	20	33	SW-SW-SE
CL-CRO-004	Historic	48	20	33	SE-SW-SE
CL-CRO-006	Historic	48	20	33	SE-SW-SE
CL-KAL-008	Historic	47	20	5	NW-NW
CL-KAL-005	Historic	47	20	8	SW-NW
21SL0874	Archaeology	51	20	27	SE

Impacts and Mitigation

Because the proposed Project is the rebuild of an existing line and is adjacent to roads for 76% of the length, the corridor has already been disturbed and the likelihood of affecting archaeological resources is relatively low. Archaeological sites may be disturbed during construction of transmission structures, substations and substation expansions, maintenance structures, staging areas or access roads. Historic buildings or other sites may be impacted as well in that construction of modern transmission structures may compromise the integrity of a historic viewshed from or to above ground archaeological and historic resources. However, because there is a line already in place, the Applicants do not foresee a significant visual change.

The Minnesota Historical Society (MHS) was contacted¹³ requesting information on the possible effects of the proposed Project on historic properties in the Project area. MHS indicated¹⁴ that the proposed Project was reviewed pursuant to the responsibilities given the State Historic Preservation Officer by the National Historic Preservation Act of 1966 and the Procedures of the Advisory Council on Historic Preservation (36 Code of Federal Regulations 800), and to the responsibilities given the MHS by the Minnesota Historic Sites Act and the Minnesota Field Archaeology Act.

The MHS recommended that an archaeological survey be completed. Because the Project is a rebuild of an existing line, the Applicants believe only a limited survey is warranted. Once line design is complete and pole locations are known, the route will be visually inspected to assess cultural resource potential. Segments of the route considered to be of high potential for the existence of archaeological deposits will be physically inspected. If surface visibility is sufficient, pedestrian survey will be conducted within the project ROW. If surface visibility is not sufficient to allow pedestrian survey, subsurface investigations will be initiated.

If any archaeological sites are identified during placement of the poles along the permitted route, construction work will be stopped and MHS staff consulted as to how to proceed. The Applicants will make every effort to avoid impacts to identified archaeological and historic resources. In the event that an impact would occur, the Applicants will consult with SHPO and invited consulting parties (particularly Native American Tribes and other State and Federal permitting or land management agencies) on whether or not the resource is eligible for listing in the NRHP. While avoidance of the resource would be a preferred action, mitigation for Project-related impacts on NRHP-eligible archaeological and historic resources may include an effort to minimize Project impacts on the resource and/or additional documentation through data recovery.

A project review request letter was sent to the Fond du Lac Band of Lake Superior Chippewa¹⁵, but no response was received.

¹³ Letter from Carole Schmidt, Great River Energy and Dan McCourtney, Minnesota Power to Mary Ann Heidemann, MHS. 12 October 2010. *See* Appendix G.

¹⁴ Letter from Mary Ann Heidemann, MHS to Carole Schmidt, Great River Energy. 10 November 2010. *See* Appendix G.

¹⁵ Letter from Carole Schmidt, Great River Energy and Dan McCourtney, Minnesota Power to Wayne Dupuis, Fond du Lac Band of Lake Superior Chippewa. 12 October 2010. *See* Appendix G.

9.5 Natural Environment

9.5.1 Air Quality

The only potential air emissions from a transmission line result from corona, which may produce ozone and oxides of nitrogen. This can occur when the electric field intensity exceeds the breakdown strength of the air. For a 115 kV transmission line, the conductor surface gradient is typically below the air breakdown level. As such, it is unlikely that any measurable emissions would occur from the conductor surface.

Impacts and Mitigation

No impacts to air quality are anticipated due to the operation of the transmission line.

Temporary and localized air quality impacts caused by construction vehicle emissions and fugitive dust from ROW clearing and construction are expected to occur. Exhaust emissions from diesel equipment will vary during construction, but will be minimal and temporary. The magnitude of emissions is influenced heavily by weather conditions and the specific construction activity taking place. Appropriate dust control measures will be implemented.

9.5.2 Water Resources

Hydrologic features in the Project area and along the proposed route are shown in Figures 9-4a to 9-4e. Hydrologic features, such as wetlands, lakes, rivers and floodplains perform several important functions within a landscape, including flood attenuation, groundwater recharge, water quality protection and wildlife habitat production.

The Project lies within the St. Louis watershed of the Lake Superior Basin.¹⁶

Ground Water

The DNR divides Minnesota into six groundwater provinces. St. Louis and Carlton counties fall into the Central Province, which is described as sand aquifers in generally thick sandy and clayey glacial drift overlaying Precambrian and Cretaceous bedrock. Fractured and weathered Precambrian bedrock is used locally as a water source.¹⁷

Lakes

Lakes in the Project area include Prairie Lake (848 acres), Mud Lake, Blackwood Lake (34 acres), Cross Lake (104 acres), Springer Lake (8 acres), North Island Lake (113 acres), South Island Lake (319 acres), Flower Lake (12 acres) and Eagle Lake (389 acres)¹⁸ (Figures 9-4a to 9-4e). The route comes the closest to Cross Lake, approximately 140 feet from the riparian area and 300 feet from open water.

¹⁶ http://www.pca.state.mn.us/water/basins/Lake_Superior/index.html (2010)

¹⁷ http://files.dnr.state.mn.us/natural_resources/water/groundwater/provinces/gwprov.pdf (2010)

¹⁸ <http://www.dnr.state.mn.us/Lakefind/index.html> <http://www.dnr.state.mn.us/maps/compass.html> (2010)



Proposed Great River Energy (GRE)

- Transmission Line**
- ■ ■ Transmission Line To Be Removed
 - ■ ■ Proposed New Transmission Line
 - ■ ■ Rebuild Existing Single Circuit 69 kV to Double Circuit 115/69 kV Transmission Line
 - ■ ■ Rebuild Existing Single Circuit 69 kV to Single Circuit 115 kV Transmission Line
- Existing Great River Energy**
- ▲ Transmission Substation
 - 23-69 kV Transmission Line
 - 115-161 kV Transmission Line
 - 230-500 kV Transmission Line

Existing Lake Country Power (LCP)

- Distribution Substation
- Proposed Minnesota Power**
- Switching Station
- Existing Minnesota Power**
- 115-161 kV Transmission Line
 - 23-69 kV Transmission Line
 - 230-345 kV Transmission Line
 - 250 kV DC Transmission Line
 - ▲ Transmission Substation
 - Distribution Sub
 - Riparian Area

NWI Wetlands

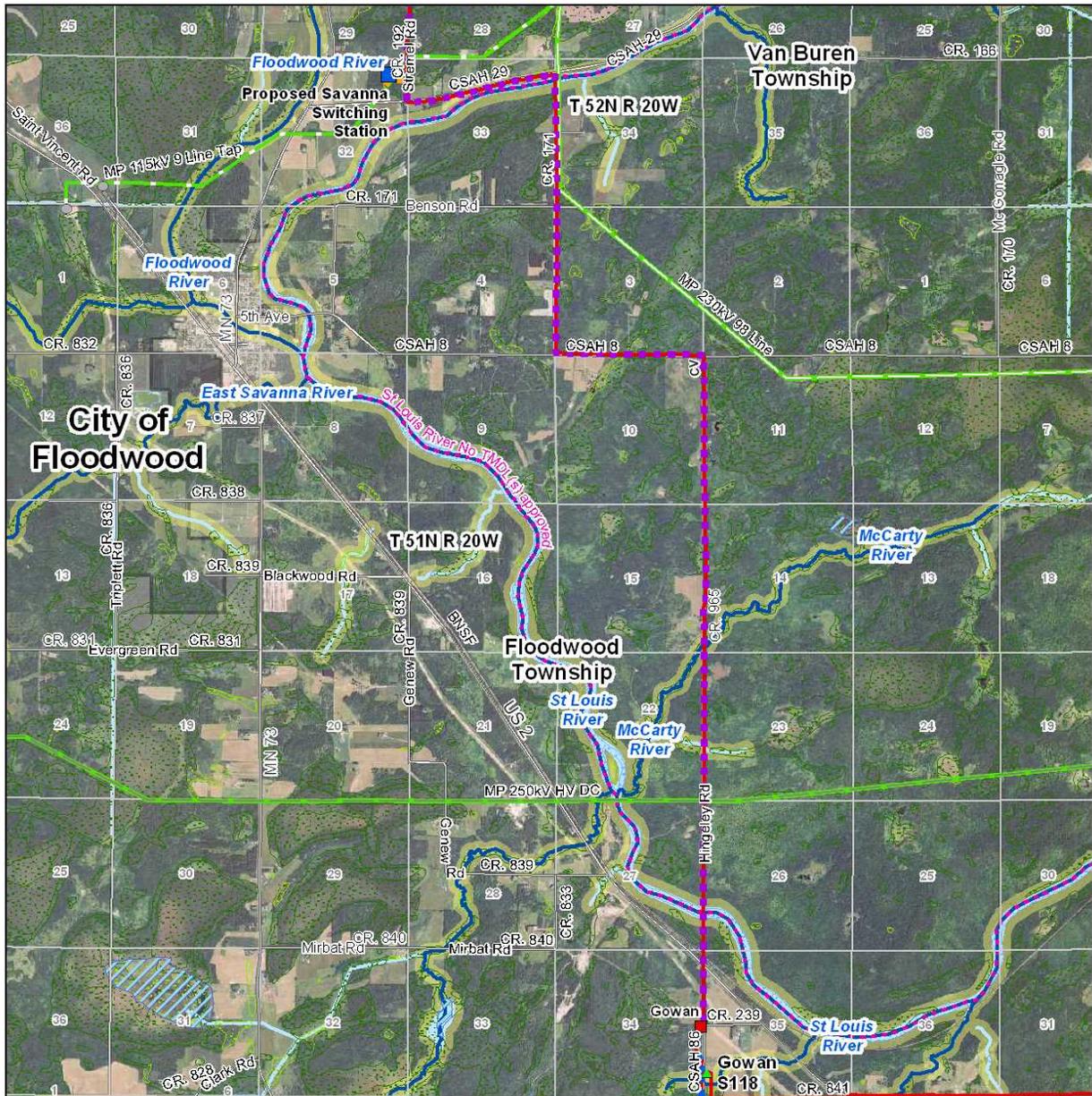
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Riverine
- PWI River
- Public Water Basin
- Public Water Wetland
- Impaired Lakes
- Impaired Streams

**Savanna 115 kV Project
Figure 9-4a
Hydrologic Features**



N 0 0.25 0.5 Miles
Updated: 2/8/2011

Data Sources Vary Between MNDOT, MNDNR, MNGEO & Great River Energy. NWI Wetlands & PWI from MNDNR. Impaired Waters from MN Pollution Control Agency (MPCA). 2010 Color Orthophotos from Farm Services Administration Map Projection. UTM, NAD83, Zone15, Meters



- Proposed Great River Energy (GRE)**
- Transmission Line**
- ■ ■ Transmission Line To Be Removed
 - ■ ■ Proposed New Transmission Line
 - ■ ■ Rebuild Existing Single Circuit 69 kV to Double Circuit 115/69 kV Transmission Line
 - ■ ■ Rebuild Existing Single Circuit 69 kV to Single Circuit 115 kV Transmission Line
- Existing Great River Energy**
- ▲ Transmission Substation
 - 23-69 kV Transmission Line
 - 115-161 kV Transmission Line
 - 230-500 kV Transmission Line

- Existing Lake Country Power (LCP)**
- Distribution Substation
- Proposed Minnesota Power**
- Switching Station
- Existing Minnesota Power**
- 115-161 kV Transmission Line
 - 23-69 kV Transmission Line
 - 230-345 kV Transmission Line
 - 250 kV DC Transmission Line
 - ▲ Transmission Substation
 - Distribution Sub
 - Riparian Area

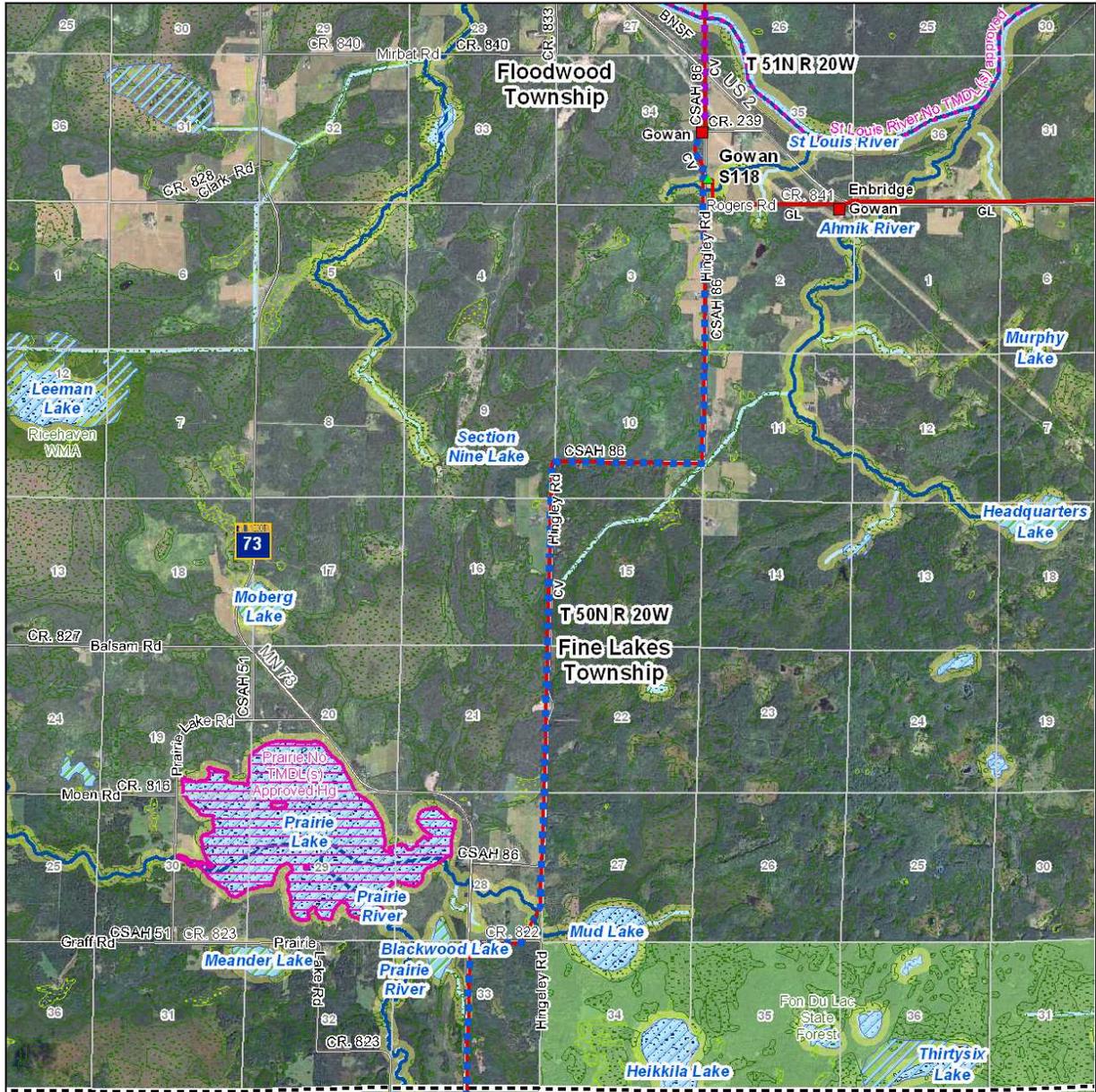
- NWI Wetlands**
- Freshwater Emergent Wetland
 - Freshwater Forested/ Shrub Wetland
 - Freshwater Pond
 - Lake
 - Riverine
 - PWI River
 - Public Water Basin
 - Public Water Wetland
 - Impaired Lakes
 - Impaired Streams

Savanna 115 kV Project
Figure 9-4b
Hydrologic Features

GREAT RIVER ENERGY
 A Northern Energy Company

N 0 0.25 0.5 Miles
 Updated: 2/8/2011

Data Sources Vary Between MNDOT, MNDNR, MNGEO & Great River Energy. NWI Wetlands & PWI from MNDNR. Impaired Waters from MN Pollution Control Agency (MPCA). 2010 Color Orthophotos from Farm Services Administration Map Projection. UTM, NAD83, Zone15, Meters



Proposed Great River Energy (GRE)

- Transmission Line**
- ■ ■ Transmission Line To Be Removed
 - ■ ■ Proposed New Transmission Line
 - ■ ■ Rebuild Existing Single Circuit 69 kV to Double Circuit 115/69 kV Transmission Line
 - ■ ■ Rebuild Existing Single Circuit 69 kV to Single Circuit 115 kV Transmission Line
- Existing Great River Energy**
- ▲ Transmission Substation
 - 23-69 kV Transmission Line
 - 115-161 kV Transmission Line
 - 230-500 kV Transmission Line

Existing Lake Country Power (LCP)

- Distribution Substation
- Proposed Minnesota Power**
- Switching Station
- Existing Minnesota Power**
- 115-161 kV Transmission Line
 - 23-69 kV Transmission Line
 - 230-345 kV Transmission Line
 - 250 kV DC Transmission Line
 - ▲ Transmission Substation
 - Distribution Sub
 - Riparian Area

NWI Wetlands

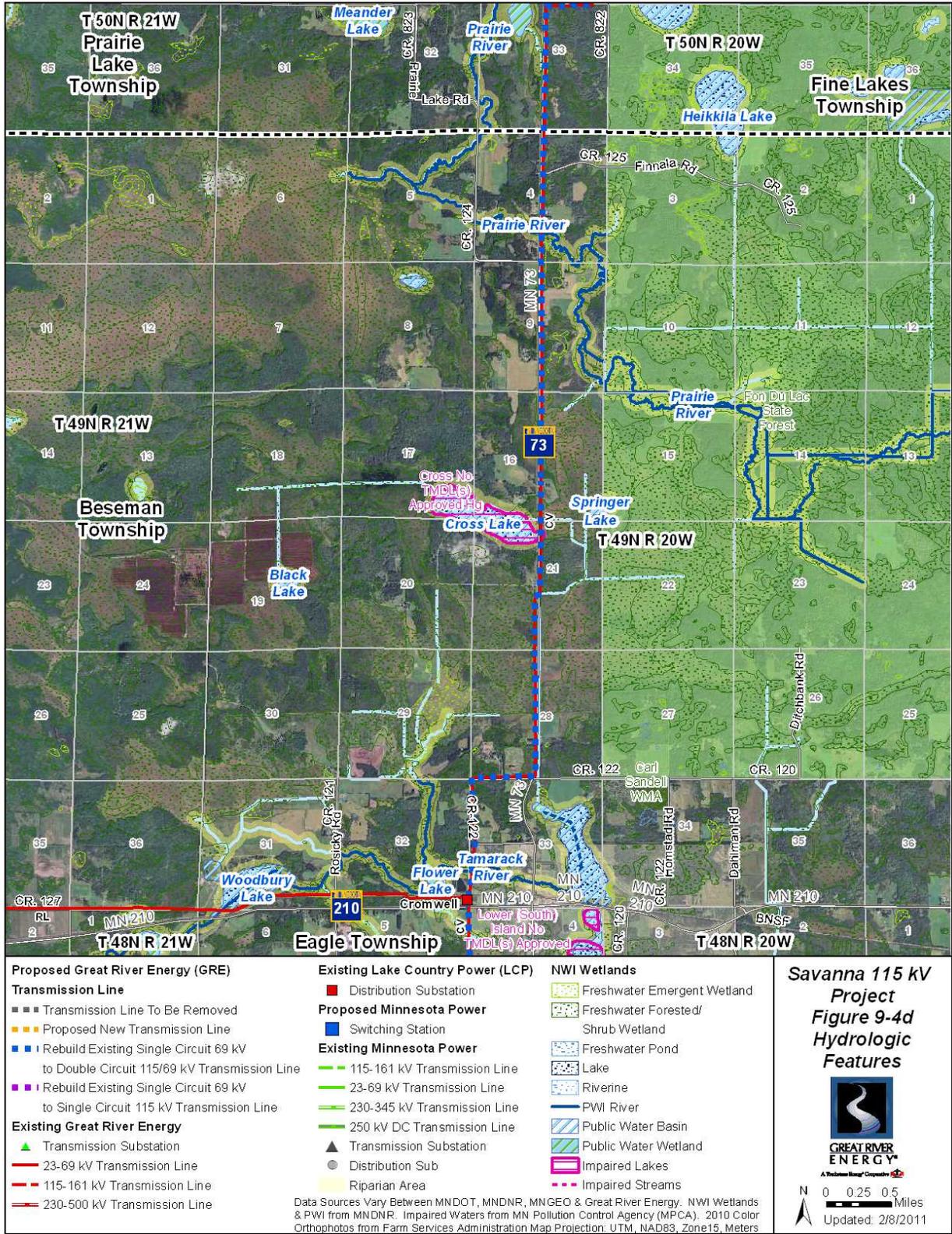
- Freshwater Emergent Wetland
- Freshwater Forested/ Shrub Wetland
- Freshwater Pond
- Lake
- Riverine
- PWI River
- Public Water Basin
- Public Water Wetland
- Impaired Lakes
- Impaired Streams

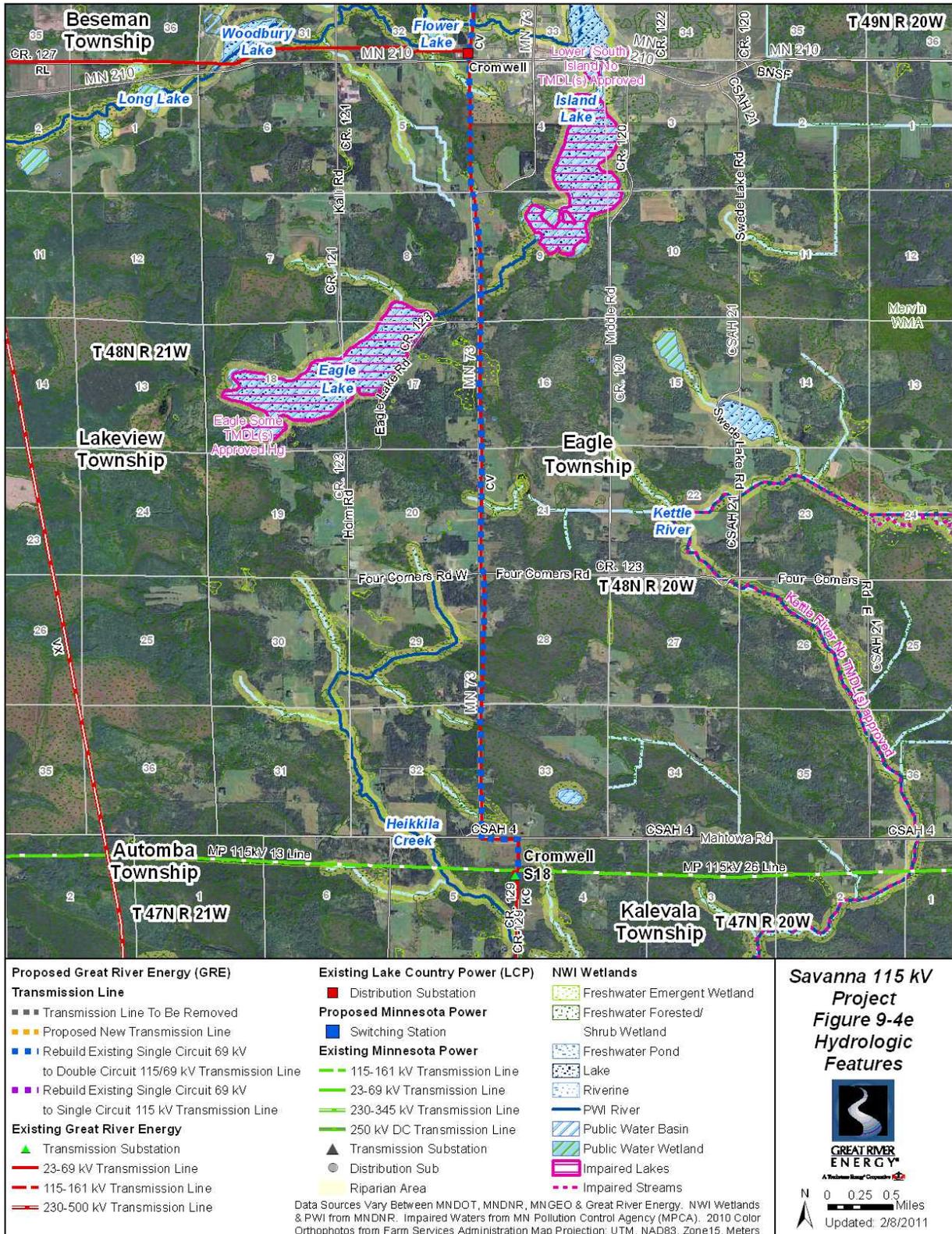
**Savanna 115 kV Project
Figure 9-4c
Hydrologic Features**



0 0.25 0.5 Miles
Updated: 2/8/2011

Data Sources Vary Between MNDOT, MNDNR, MNGEO & Great River Energy. NWI Wetlands & PWI from MNDNR. Impaired Waters from MN Pollution Control Agency (MPCA). 2010 Color Orthophotos from Farm Services Administration Map Projection: UTM, NAD83, Zone15, Meters





Rivers and Streams

There are a number of rivers and streams in the Project area, including the St. Louis River, Floodwood River, East Savanna River, McCarty River, Prairie River, Tamarack River, Kettle River and Heikkila Creek (Figures 9-4a to 9-4e).

The transmission line will cross tributaries to the Floodwood River, the St. Louis River and tributary, McCarty River, Prairie River, Tamarack River and two drainages between lakes.

Riparian Areas

Riparian areas are ecosystems that occur along watercourses or at the fringe of water bodies. For purposes of this Application, the riparian areas are defined as the land within 300 feet of streams and within 1,000 feet of lakes. These distances were selected because they are consistent with the definition of shoreland in the DNR Statewide Standards. These statewide standards set guidelines for the use and development of shoreland (riparian) property around all lakes greater than 25 acres (10 acres in municipalities) and rivers with a drainage area of two miles or greater.

The proposed route crosses riparian areas associated with the rivers and streams listed above (Figures 9-4a to 9-4e).

Public Waters

Public Waters are wetlands, water basins and watercourses of significant recreational or natural resource value in Minnesota as defined in Minnesota Statutes Section 103G.005. The DNR has regulatory jurisdiction over these waters, which are identified on the DNR Public Waters Inventory (PWI) maps¹⁹.

The transmission line would cross 10 Public Waters as shown on Figures 9-4a to 9-4e and listed in Table 9-6.

Impaired Waters

Section 303(D) of the Federal Clean Water Act requires states to publish, every two years, a list of streams and lakes that are not meeting their designated uses because of excess pollutants (impaired waters). The list, known as the 303(d) list, is based on violations of water quality standards. In Minnesota, the MPCA has jurisdiction over determining 303(d) waters. These waters are described as “impaired”. There are several waterbodies in the Project area classified with mercury impairment, including the St. Louis River, Prairie Lake, and Cross Lake. North Island Lake, South Island Lake, and Eagle Lake are impaired for nutrients/eutrophication (Figures 9-4a to 9-4e).

¹⁹ MNDNR: *Public Waters Inventory Maps*.

http://files.dnr.state.mn.us/waters/watermgmt_section/pwi/CARL1OF1.pdf (2010)

http://files.dnr.state.mn.us/waters/watermgmt_section/pwi/STLO1OF7.pdf (2010)

Table 9-6 PWI Waters

County	Name	Type	Location
St. Louis	Tributary of Floodwood River	Stream	T52N, R20W, Section 7
	Tributary of Floodwood River	Stream	T52N, R20W, Section 20
	St. Louis River	River	T52N, R20W, Section 33
	McCarty River	River	T51N, R20W, Section 15
	St. Louis River	River	T51N, R20W, Section 27
	Tributary of St. Louis River	Stream	T51N, R20W, Section 34
	Drainage between Prairie Lake and Mud Lake	Stream	T50N, R20W, Section 28
Carlton	Prairie River	River	T49N, R20W, Section 4
	Tamarack River	River	T49N, R20W, Section 32
	Drainage between Eagle Lake and Island Lake	Stream	T49N, R20W, Section 9

Floodplains

The transmission line would cross the floodplains of the rivers listed above.

Wetlands

Wetlands are important resources for flood abatement, wildlife habitat, and water quality. Wetlands that are hydrologically connected to the nation’s navigable rivers are protected federally under Section 404 of the Clean Water Act. In Minnesota, wetlands are also protected under the Wetland Conservation Act.

The USFWS produced maps of wetlands based on aerial photographs and NRCS soil surveys starting in the 1970s. These wetlands are known as the National Wetland Inventory (NWI). Wetlands listed on the NWI may be inconsistent with current wetland conditions; however, NWIs are the most accurate and readily available database of wetland resources within the Project area and were therefore used to identify wetlands along the proposed route. The wetland types and lengths within the proposed route are provided in Table 9-7.

The transmission line would cross approximately 5.9 miles of NWI wetlands. Scrub-shrub and forested wetlands are the dominant wetland types.

Table 9-7 Wetland Types along the Proposed Route (NWI)

Cowardin Type¹	No. of Basins	Length of Crossing (miles)	Percent of Wetland Type within Proposed Route
PEMB	9	0.9	15
PEME	1	0.2	3
PFOB	7	0.3	5
PFO4B	4	0.5	8.5
PF0/SSB	5	0.3	5
PF01/SSB	1	0.2	3
PSSB	11	0.6	10
PSS1B	2	0.4	7
PSS1C	1	0.1	2
PSS1/EMC	1	0.1	2
PSS/EMB	9	1.6	27
PSS/EM5B	1	0.1	2
PSS3BG	1	0.5	8.5
PSSE	1	0.1	2
Total	54	5.9	100

Cowardin et. al. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. US Department of the Interior, USFWS, Washington D.C. The wetland type was classified using the Cowardin system that defines the habitat system, vegetative and sediment class and water regime. The wetland classification system is hierarchical, with wetlands and deepwater habitats divided among five major systems at the broadest level. The five systems include Marine (open ocean and associated coastline), Estuarine (salt marshes and brackish tidal water), Riverine (rivers, creeks, and streams), Lacustrine (lakes and deep ponds), and Palustrine (shallow ponds, marshes, swamps, sloughs). Systems are further subdivided into subsystems that reflect hydrologic conditions. Below the subsystem is the class that describes the appearance of the wetland in terms of vegetation or substrate. Each class is further subdivided into subclasses; vegetated subclasses are described in terms of life form, and substrate subclasses in terms of composition. The classification system also includes modifiers to describe hydrology (water regime), soils, water chemistry (pH, salinity), and special modifiers relating to man's activities (e.g., impounded, partly drained).

Some common symbols used in the wetland classification system include:

<u>SYSTEM:</u>	P - Palustrine	L - Lacustrine
<u>CLASS:</u>	RB - Rock Bottom	UB - Unconsolidated Bottom
	EM - Emergent	SS - Scrub-Shrub
	FO - Forested	OW - Open Water
<u>MODIFIERS:</u>	A - Temporarily flooded	B - Saturated
	C - Seasonally flooded	D - Seasonally well drained
	E - Seasonally saturated	F - Semipermanently flooded
	G - Intermittently flooded	H - Permanently flooded
<u>SPECIAL MODIFIERS:</u>	b - beaver	d - partially drained/ditched
	f - farmed	s - spoil
	x - excavated	

Wetlands classified as Palustrine Emergent (PEM) make up approximately 18% of the wetland types. Those classified as Palustrine Scrub-Shrub (PSS) make up approximately 60.5% and Palustrine Forested (PFO) wetlands make up approximately 21.5%.

Impacts and Mitigation

No impacts to groundwater in the Project area are anticipated.

The transmission line does not cross any of the lakes in the area, and no navigable waters will be affected by the Project.

Because all rivers and streams will be spanned by transmission structures, no structures will be located within these features and no direct impacts to rivers or streams are anticipated. Indirect impacts could include sedimentation reaching surface waters during construction due to ground disturbance by excavation, grading, construction traffic, and dewatering of holes drilled for transmission structures. This could temporarily degrade water quality due to turbidity. These impacts will be avoided or minimized using appropriate sediment control practices and BMPs.

Once the Project is completed, there would be no significant impact on surface water quality because wetland impacts will be minimized and mitigated, disturbed soil will be restored to previous conditions or better, and the amount of land area converted to an impervious surface will be small.

Sound water and soil conservation practices will be maintained during construction and operation of the Project to protect topsoil and adjacent water resources and minimize soil erosion. These practices may include:

- Containing stockpiled material away from stream banks and lake shorelines.
- Stockpiling and respreading topsoil.
- Reseeding and revegetating disturbed areas.
- Implementing erosion and sediment controls.
- Locating structures and disturbed areas as far away from rivers and streams as practicable.

The transmission line will cross 10 DNR Public Waters.²⁰ Great River Energy will apply for a license to cross these waters once design details are available and will follow any recommendations to minimize erosion and other impacts.

The Project should have no impact on the impairment status of the waters in the Project area. There is potential to increase turbidity due to increase sedimentation from construction activities; however, appropriate erosion and sediment control measures will be implemented to avoid or minimize such impacts.

Potential impacts to riparian areas along the route would be limited to ground disturbances due to pole placement. Due to the flexibility to avoid placing poles in sensitive areas, the anticipated impacts to the riparian areas along the route are minimal.

Construction of the transmission line is not expected to alter existing water drainage patterns or floodplain elevations due to the small cross section per pole and their relatively wide spacing. Although construction of the proposed Savanna Switching Station will involve a small increase in impermeable surfaces (from the electrical equipment enclosure and structure footings), the change to local surface drainage patterns from this and any necessary grading is expected to be negligible. The small area of impermeable surfaces created by the pole structures and breaker station outbuildings or foundations will not cause an increase in susceptibility of flooding in the region.

Temporary impacts to wetlands may occur if they need to be crossed during construction of the transmission line. No staging or stringing set up areas will be placed within or adjacent to water resources, as practicable. Wetland impact avoidance measures that will be implemented during design and construction of the transmission line include spacing and placing the power poles at variable distances to span and avoid wetlands, where possible. When it is not possible to span the wetland, several measures will be utilized to minimize impacts during construction:

²⁰ MNDNR: Public Waters Inventory Maps.
http://files.dnr.state.mn.us/waters/watermgmt_section/pwi/CARL1OF1.pdf (2010)
http://files.dnr.state.mn.us/waters/watermgmt_section/pwi/STLO1OF7.pdf (2010)

- When possible, construction will be scheduled during frozen ground conditions.
- Construction crews will attempt to access the wetland with the least amount of physical impact to the wetland (*i.e.*, shortest route) and will access poles near/in wetlands from roadways whenever possible to minimize travel through wetland areas.
- The structures will be assembled on upland areas before they are brought to the site for installation, when practicable.
- When construction during winter is not possible, construction mats (wooden mats or the Dura-Base Composite Mat System) will be used to protect wetland vegetation. Additionally, all-terrain construction vehicles may be used, which are designed to minimize impact to soils in damp areas.

Permanent impacts to wetlands occur where structures must be located within wetland boundaries (approximately 20 square feet of permanent impacts per structure). Wetland vegetation would be restored in the disturbed areas following construction.

Once design details are available, Great River Energy will apply for a Regional General Permit under Section 404 of the Clean Water Act from the Corps, restore the wetlands as required by the Corps, and comply with the requirements of the Wetland Conservation Act.

Vegetation maintenance procedures under transmission lines prohibit trees from establishing. Existing trees must be removed throughout the entire ROW, including forested wetlands. These wetlands would undergo permanent vegetative changes within the ROW, and mitigation for the conversion of forested wetlands to emergent and shrub/scrub wetlands will likely be required by the Corps.

In the event that impacts to hydrologic features are unavoidable, the Applicants will work with the jurisdictional agencies to determine the best ways to minimize the impacts and create appropriate mitigation measures.

9.5.3 Flora and Fauna

Flora

Presettlement vegetation consisted of lowland conifers (black spruce, tamarack, and white cedar), lowland hardwoods (black ash), sedge meadows, aspen-birch, northern hardwoods, upland conifers, white pine-red pine forests, and mixed hardwood-pine forests. The primary present day land uses in the Project area are forestry, recreation and tourism, and agriculture.

Although none are crossed by the proposed route, there are several areas in the Project area where natural vegetation is being managed, including:

- Savanna State Forest
- Fond Du Lac State Forest
- Wawina Peatland SNA
- Floodwood WMA

- Ricehaven WMA
- Carl Sandell WMA
- Mervin WMA
- Kettle Lake WMA

These resources provide potential habitat for native vegetation, wildlife and rare and unique resources.

Fauna

The USFWS website indicated that the Gray wolf and Canada lynx are present in St. Louis and Carlton counties.²¹ The USFWS was contacted by letter²² and their response email of January 11, 2011²³ indicated that no federally listed species or critical habitat are documented in the Project area.

The state forests and WMAs in the vicinity of the Project provide habitat for a variety of animal species, including deer, bear, small game, forest game birds, sharptail grouse, and waterfowl. There are no USFWS Waterfowl Production Areas in the Project area.

Impacts and Mitigation

No impacts to native vegetation are anticipated. The proposed transmission line will generally follow the existing transmission ROW, minimizing impacts to previously-undisturbed vegetation.

There is minimal potential for the displacement of wildlife and loss of habitat from construction of the Project. Wildlife that inhabit natural areas could be impacted in the short-term within the immediate area of construction. The distance that animals will be displaced will depend on the species. Additionally, these animals will be typical of those found in forested and agricultural settings and should not incur population level effects due to construction.

Raptors, waterfowl and other bird species may be affected by the construction and placement of the transmission lines. Avian collisions are a possibility after the completion of the transmission line. Waterfowl are typically more susceptible to transmission line collision, especially if the transmission line is placed between agricultural fields that serve as feeding areas, or between wetlands and open water, which serve as resting areas.

The Applicants will address avian issues by working with the DNR and USFWS to identify any areas that may require marking transmission line shield wires and/or to use alternate structures to reduce the likelihood of collisions.

²¹ US Fish and Wildlife Webpage Endangered Species. <http://www.fws.gov/Midwest/Endangered/LISTS/minnesotacy.html>

²² Letter from Carole Schmidt, Great River Energy and Dan McCourtney, Minnesota Power to Nick Rowse, US Fish and Wildlife Service. 12 October 2010. *See* Appendix G.

²³ Email from Nick Rowse, US Fish and Wildlife Service to Carole Schmidt, Great River Energy. 11 January 2011. *See* Appendix G.

In their email of January 11, 2011, the USFWS recommended that surveys of nests and foraging, roosting or wintering areas for eagles and other migratory birds be completed within a half mile of the line construction. Due to the nature of the Project (rebuild of an existing line), the Applicants believe that the likelihood of discovering new nests or foraging/wintering areas is low, and formal surveys should not be required. Instead, any nests discovered during survey of the line or in the land acquisition process will be reported to Margaret Rheude of the Twin Cities Field Office and the Applicants will adhere to guidance provided by the USFWS.

9.6 Rare and Unique Natural Resources

Rare and unique natural features include federal and state protected and rare species, remnant areas of native vegetation, significant natural resource sites, and significant natural features.

The DNR was contacted²⁴ requesting information on the possible effects of the proposed Project on rare and unique features in the Project area. In an email dated December 8, 2010, the DNR indicated that there were no concerns regarding rare features for the Savanna Project²⁵.

Rare and unique resources within two miles of the proposed route are listed in Table 9-8 and shown on Figures 9-5a to 9-5e. These resources were identified using the DNR Natural Heritage database.

All of the occurrences of rare features except one botanical feature are outside of the proposed route corridor. The route passes just to the west of a DNR Site of Moderate Biodiversity Significance south of Gowan.

Impacts and Mitigation

Rebuilding along existing transmission ROW will avoid impacting undisturbed habitat along the route. The Applicants will continue to coordinate with the DNR and USFWS to ensure that sensitive species in the Project area are not impacted by construction of the Project.

The following measures will be used to help avoid or minimize impacts to area wildlife and rare natural resources during and after the completion of the proposed transmission line:

- Minimize tree felling and shrub removal that are important to area wildlife.
- Utilize BMPs to prevent erosion of the soils in the areas of impact.
- Implement sound water and soil conservation practices during construction and operation of the Project to protect topsoil and adjacent water resources and minimize soil erosion. Practices may include containing excavated material, protecting exposed soil, and stabilizing restored soil.
- Re-vegetate disturbed areas with native species and wildlife conservation species where applicable.
- Implement raptor protection measures, including placement of bird flight diverters on the line at water crossings after consultation with local wildlife management staff.

²⁴ Letter from Carole Schmidt, Great River Energy and Dan McCourtney, Minnesota Power to Lisa Joyal, Minnesota Department of Natural Resources. October 12, 2010. *See* Appendix G.

²⁵ Email from Lisa Joyal, Minnesota Department of Natural Resources to Carole Schmidt, Great River Energy. December 8, 2010. *See* Appendix G.

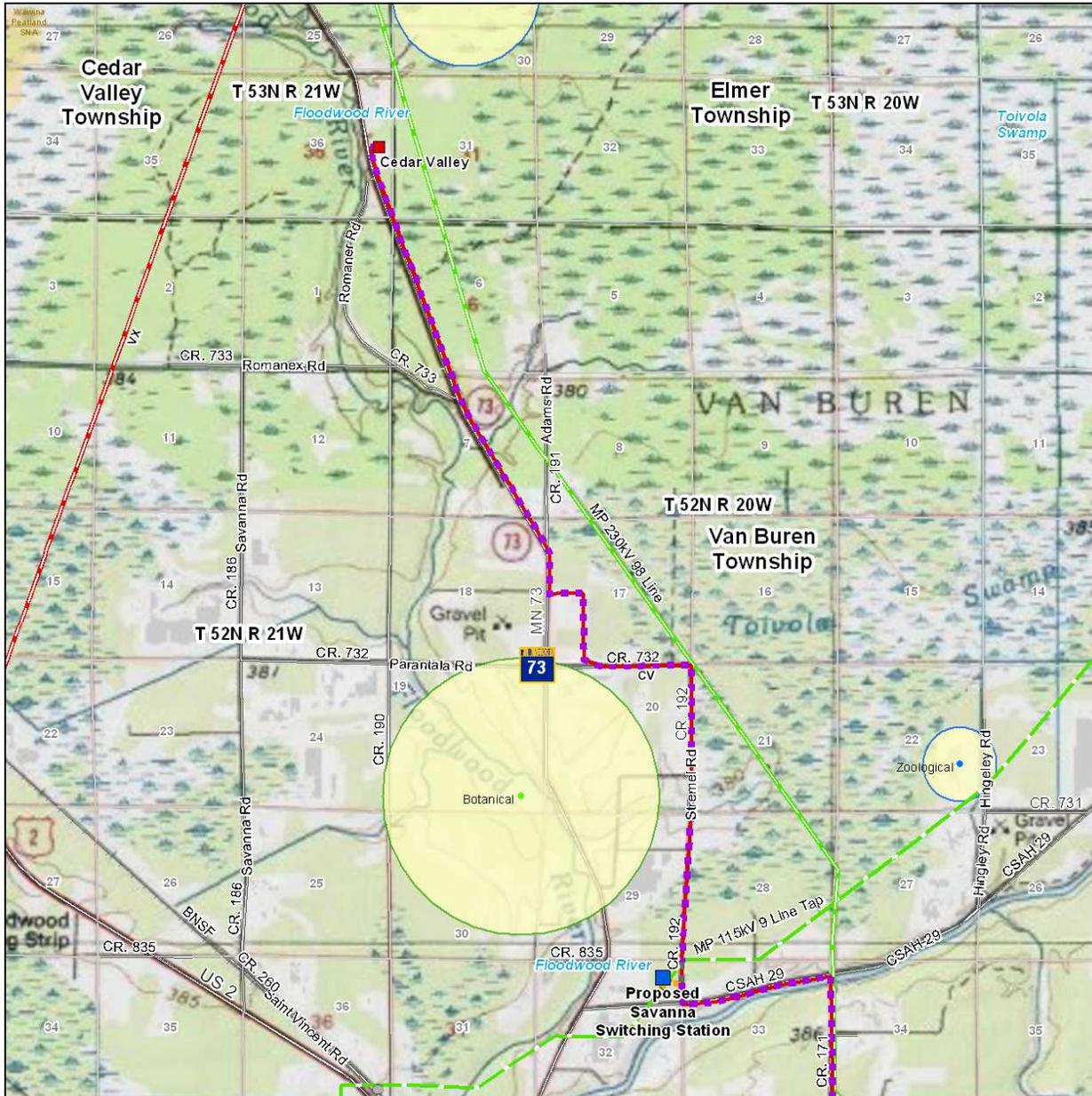
Table 9-8 Rare and Unique Resources within Two Miles of the Proposed Route

Common Name	Scientific Name	Number of Occurrences	Federal Status	MN Status*	State Rank**	Habitat
Colonial Waterbird Nesting Site	Various	1	N/A	N/A	SNR	Marshes, lakes.
American Bittern	Botaurus lentiginosus	3	None	NON	S4B	Thick vegetation of freshwater marshes.
Sandhill Crane	Grus canadensis	1	None	NON	S4B, SNRM	Wet meadows, open landscapes.
Bog Copper	Lycaena epixanthe michiganensis	1	None	NON	S4	Butterfly found in acid bogs and boggy marshes.
Cuckoo Flower	Cardamine pratensis var. palustris	1	None	NON	SNR	Lake, marsh, fen and streamside sites.
Eastern Hemlock	Tsuga canadensis	1	None	SPC	S3	Scattered in mixed hardwood-conifer forests; typically on moist, well-drained soils in cool, sheltered valleys and ravines.
White Adder's - Mouth	Malaxis monophyloss var. brahyopoda	1	None	SPC	S3	Bog orchid found in conifer swamps within forested rich peatlands; usually occur near the upland margin of the swamp.
Spiny Hornwort	Ceratophyllum echinatum	1	None	NON	SNR	
Vasey's Pondweed	Potamogeton vaseyi	1	None	SPC	S3	Rooted, aquatic macrophyte; inhabits small, softwater lakes.

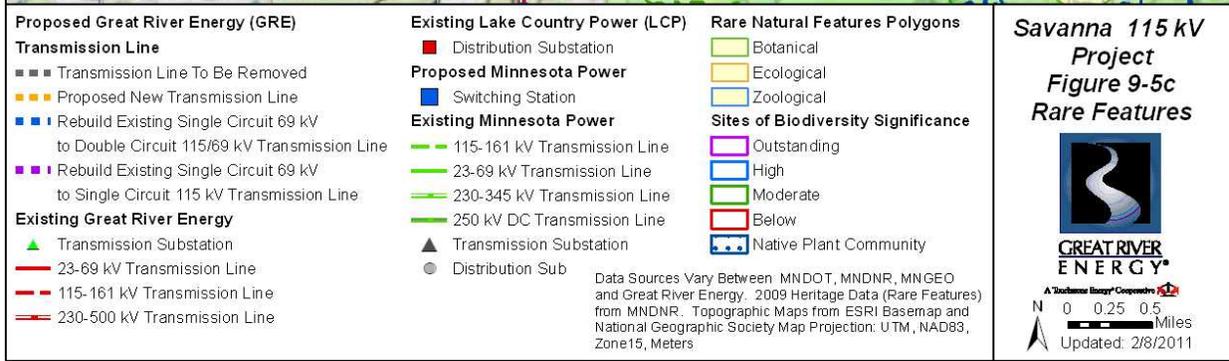
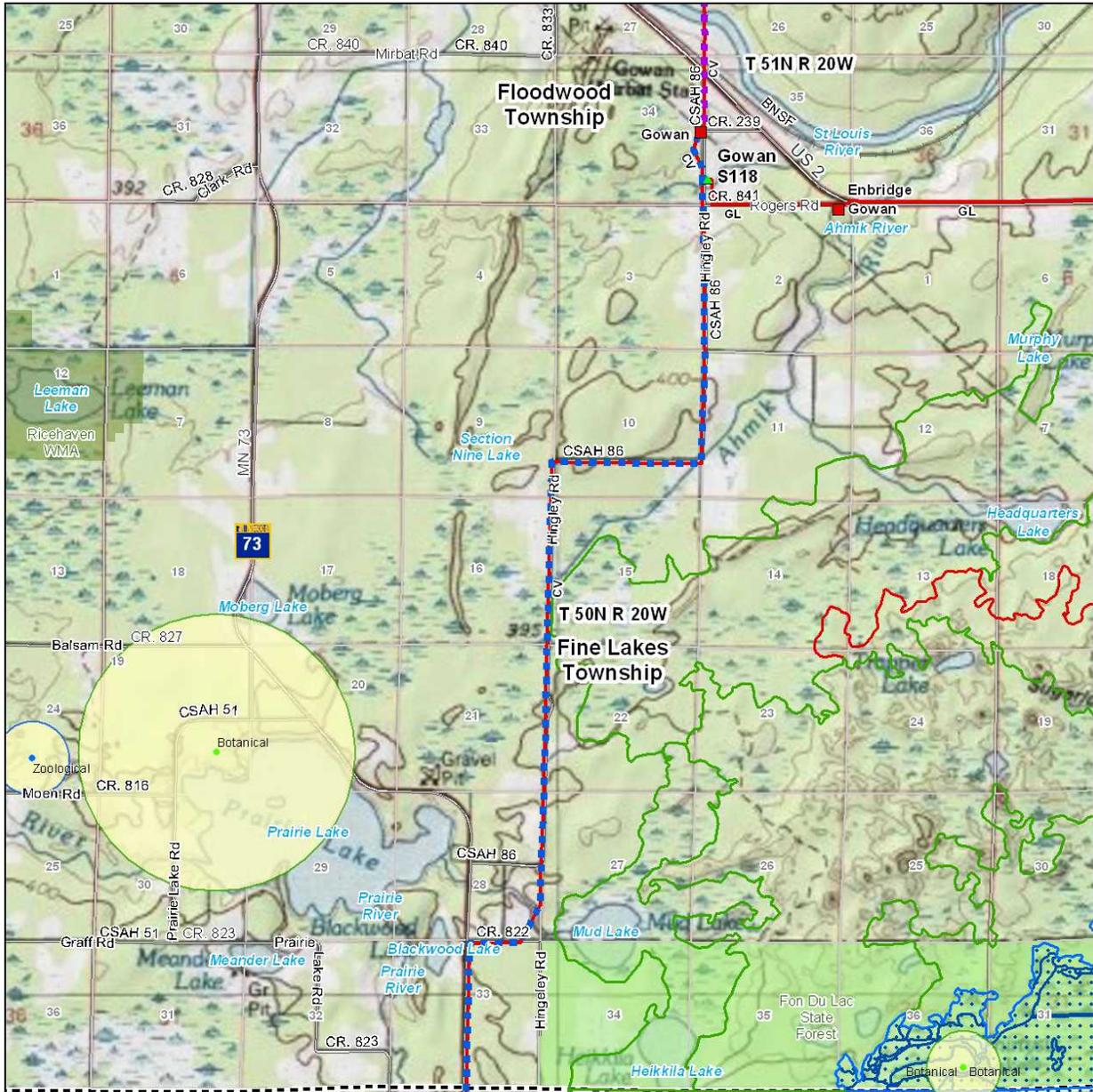
* END – Endangered; THR – Threatened; SPC – Special Concern; NON – no legal status, data being gathered for possible future listing; None – Terrestrial communities do not have assigned status, but are considered important ecologically.

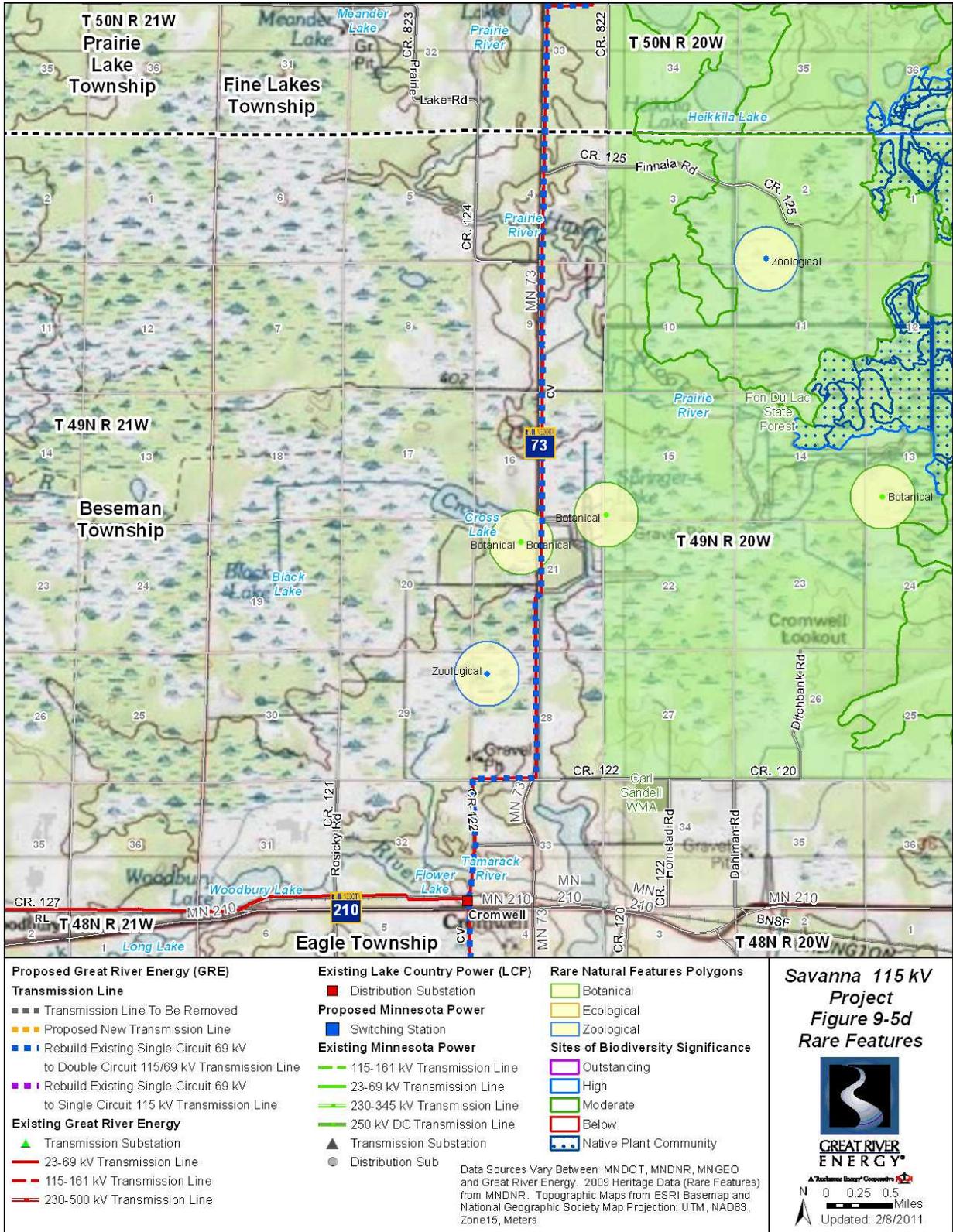
** State rank is assigned to species and terrestrial communities to reflect the relative rarity or endangerment of the species or plant community in Minnesota. Ranks range from 1 – in greatest need of conservation, to 5 – secure under present conditions. SNR – not ranked; X – extirpated, species believed to be extirpated from the State; H – historical, species occurred historically in State but has not been verified in the last 20 years.

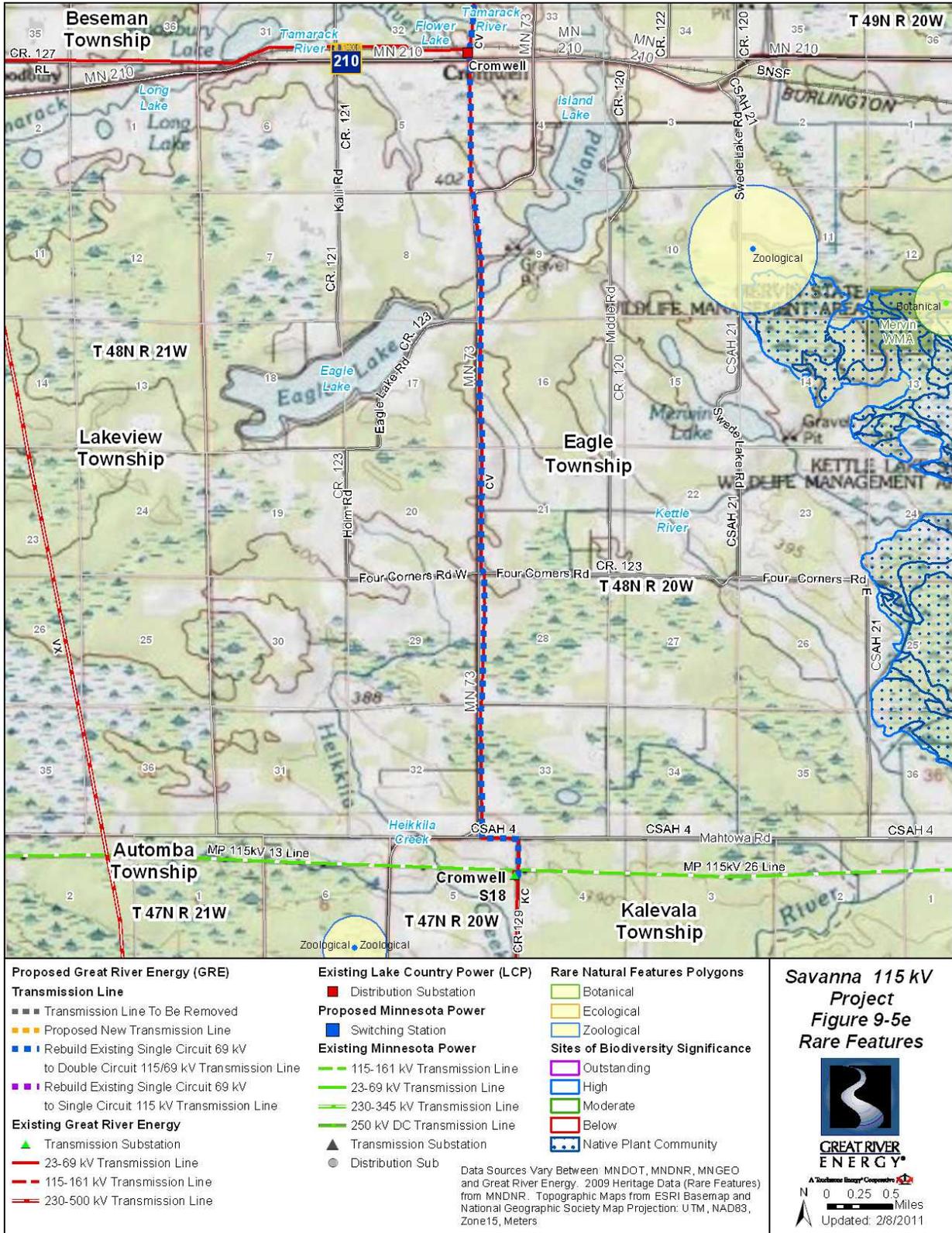
Source: Minnesota Natural Heritage Information System: Rare Features Database through License Agreement #LA-521. Data current as of January 2009.



<p>Proposed Great River Energy (GRE)</p> <p>Transmission Line</p> <ul style="list-style-type: none"> ■ ■ ■ Transmission Line To Be Removed ■ ■ ■ Proposed New Transmission Line ■ ■ ■ Rebuild Existing Single Circuit 69 kV to Double Circuit 115/69 kV Transmission Line ■ ■ ■ Rebuild Existing Single Circuit 69 kV to Single Circuit 115 kV Transmission Line <p>Existing Great River Energy</p> <ul style="list-style-type: none"> ▲ Transmission Substation — 23-69 kV Transmission Line — 115-161 kV Transmission Line — 230-500 kV Transmission Line 	<p>Existing Lake Country Power (LCP)</p> <ul style="list-style-type: none"> ■ Distribution Substation <p>Proposed Minnesota Power</p> <ul style="list-style-type: none"> ■ Switching Station <p>Existing Minnesota Power</p> <ul style="list-style-type: none"> — 115-161 kV Transmission Line — 23-69 kV Transmission Line — 230-345 kV Transmission Line — 250 kV DC Transmission Line <p>Existing Great River Energy</p> <ul style="list-style-type: none"> ▲ Transmission Substation ● Distribution Sub 	<p>Rare Natural Features Polygons</p> <ul style="list-style-type: none"> ■ Botanical ■ Ecological ■ Zoological <p>Sites of Biodiversity Significance</p> <ul style="list-style-type: none"> ■ Outstanding ■ High ■ Moderate ■ Below ■ Native Plant Community <p><small>Data Sources Vary Between: MNDOT, MNDNR, MNGEO and Great River Energy. 2009 Heritage Data (Rare Features) from MNDNR. Topographic Maps from ESRI Basemap and National Geographic Society Map Projection: UTM, NAD83, Zone15, Meters</small></p>	<p>Savanna 115 kV Project Figure 9-5a Rare Features</p>  <p><small>A Xcel Energy Company</small></p> <p>Scale: 0 0.25 0.5 Miles</p> <p>Updated: 2/8/2011</p>
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9.7 Physiographic Features

9.7.1 Topography

The proposed Project lies within the Tamarack Lowlands and St. Louis Moraines subsections of the Northern Minnesota Drift and Lake Plains Section of the Laurentian Mixed Forest Province under the DNR Ecological Classification System.

The landscape in the project area is dominated by level to gently rolling topography (Tamarack Lowlands) and rolling to steep slopes (St. Louis Moraines).

In the Tamarack Lowlands Subsection²⁶, the landscape is dominated by lake-deposited sediments with some ground moraines and low drumlin ridges. The area is characterized by level to gently rolling topography.

In the St. Louis Moraines Subsection²⁷, the landscape is dominated by end moraines with some outwash plains. The area is characterized by gently rolling to steep topography.

The topography of the Proposed route is nearly level with a few steep slopes near the St. Louis River, east of Blackwood Lake in Fine Lakes Township, near the Prairie River, near the Tamarack River, and east of Eagle Lake.

Impacts and Mitigation

Construction of the Project will not alter the topography along the route; therefore, no mitigation is necessary or proposed.

9.7.2 Geology

Unconsolidated sediments (glacial drift) overlie bedrock in the majority of the Project area.

In the Tamarack Lowlands Subsection, glacial drift ranges from 100 to 300 feet thick. Bedrock consists of Middle Precambrian argillite, siltstone. Quartzite or greywacke, weakly metamorphosed. There is also some Cretaceous shale, sandstone, and clay.

In the St. Louis Moraines Subsection, glacial drift ranges from 100 to 200 feet thick. Bedrock consists of Lower Precambrian undivided granites, metavolcanics, and metasedimentary rocks.

Impacts and Mitigation

Few geological constraints on design, construction, or operation are anticipated in the Project area. If dewatering is found to be necessary during construction (i.e., during pole embedding), the effects on water tables would be localized and short term, and would not affect geologic resources.

²⁶ <http://www.dnr.state.mn.us/ecs/212Nd/index.html>

²⁷ <http://www.dnr.state.mn.us/ecs/212Nb/index.html>

Construction of the Project will not alter the geology along the route; therefore, no mitigation is necessary or proposed.

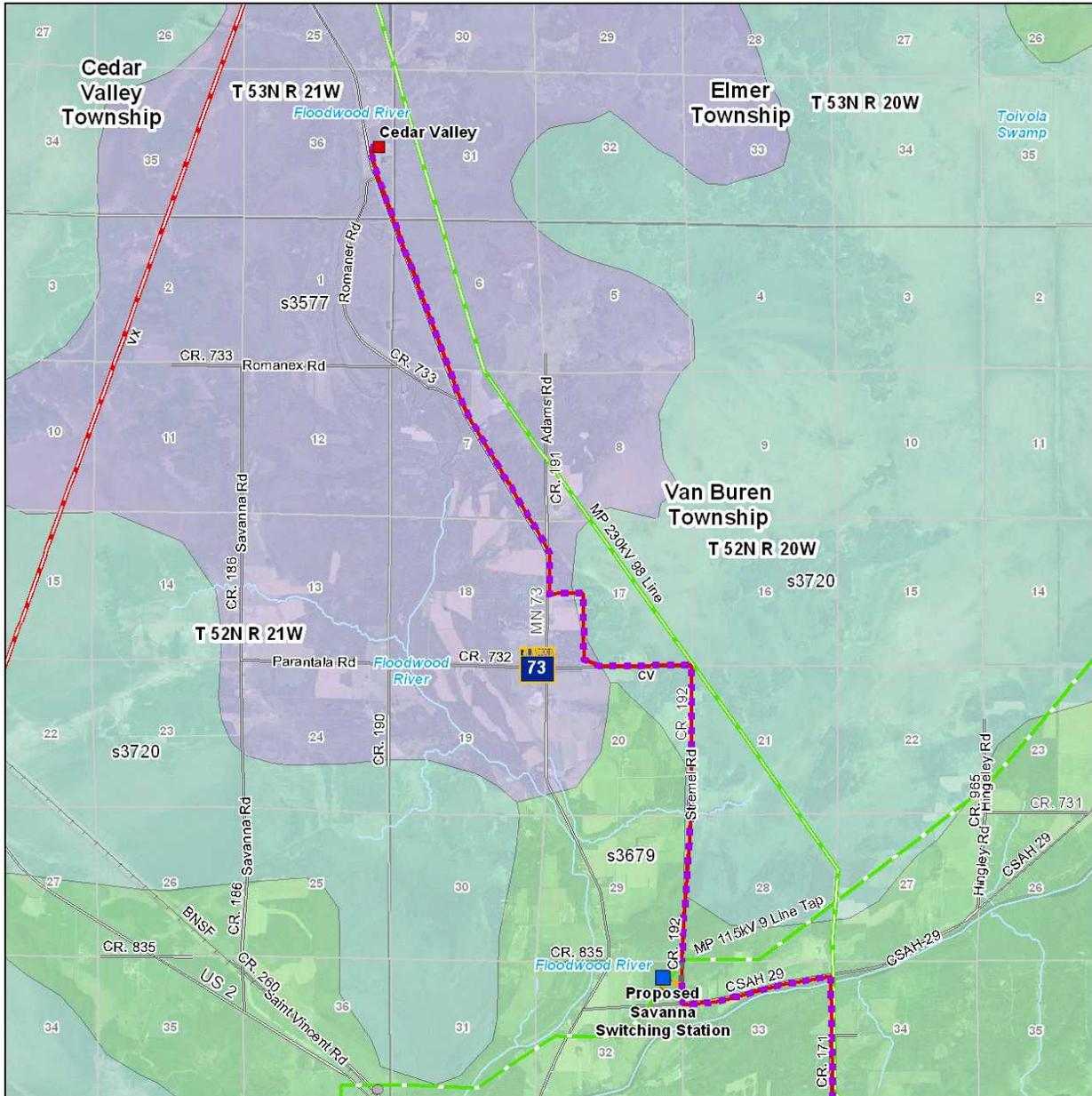
9.7.3 Soils

NRCS soil survey data²⁸ were reviewed to describe the soil resources in the vicinity of the Project. Soils are generally grouped into categories known as “associations.” A soil association has a distinctive pattern of soils, relief and drainage, and is a unique natural landscape. Typically, an association consists of one or more major soils and some minor soils. There are seven soil associations along the proposed route. These soil associations are listed in Table 9-9 and shown in Figures 9-6a to 9-6e.

Table 9-9 Soil Associations in the Vicinity of the Savanna Project

Soil Association	General Description
Rifle-Redby-Leafriver	Nearly level, very deep, somewhat poorly to very poorly drained soils that formed in organic deposits in bogs and depressional areas within ground moraines, end moraines, outwash plains and lake plains or in sandy outwash or lacustrine sediments on glacial outwash plains or lake plains.
Rifle-Greenwood	Nearly level, very deep, very poorly drained soils formed in organic deposits in bogs and depressional areas within ground and end moraines, outwash plain, lake plains and till floored lake plains.
Spooner-Baudette	Nearly level to undulating, very deep, moderately well drained to poorly drained soils formed in lacustrine sediments on glacial lake plains and moraines.
Dusler-Duluth	Nearly level to hilly, well drained to poorly drained soils with a loam subsoil on undulating moraines.
Hermantown-Ahmeek	Nearly level to hilly, very deep, well drained to somewhat poorly drained soils that formed in a friable loamy mantle and the underlying dense loamy till on moraines, till plains and drumlins.
Newson-Nemadji	Nearly level, somewhat poorly drained to very poorly drained soils with a sand subsoil on lake plains.
Hermantown-Automba	Nearly level to hilly, very deep to deep, well and moderately drained to somewhat poorly drained soils that formed in a friable loamy mantle or loamy glacial till on moraines, till plains and drumlins.

²⁸ http://soils.usda.gov/survey/online_surveys/minnesota/
<http://ortho.ftw.nrcs.usda.gov/osd/dat/S.html>



<p>Proposed Great River Energy (GRE)</p> <p>Transmission Line</p> <ul style="list-style-type: none"> ■ ■ ■ Transmission Line To Be Removed ■ ■ ■ Proposed New Transmission Line ■ ■ ■ Rebuild Existing Single Circuit 69 kV to Double Circuit 115/69 kV Transmission Line ■ ■ ■ Rebuild Existing Single Circuit 69 kV to Single Circuit 115 kV Transmission Line <p>Existing Great River Energy</p> <ul style="list-style-type: none"> ▲ Transmission Substation — 23-69 kV Transmission Line — 115-161 kV Transmission Line — 230-500 kV Transmission Line 	<p>Existing Lake Country Power (LCP)</p> <ul style="list-style-type: none"> ■ Distribution Substation <p>Proposed Minnesota Power</p> <ul style="list-style-type: none"> ■ Switching Station <p>Existing Minnesota Power</p> <ul style="list-style-type: none"> — 115-161 kV Transmission Line — 23-69 kV Transmission Line — 230-345 kV Transmission Line — 250 kV DC Transmission Line <p>▲ Transmission Substation</p> <p>● Distribution Sub</p>	<p>Soil Name</p> <ul style="list-style-type: none"> ■ Duster-Duluth (s3671) ■ Hermantown-Ahmeek (s3676) ■ Hermantown-Automba (s3680) ■ Newson-Nemadji (s3678) ■ Rifle-Greenwood (s3720) ■ Rifle-Redby-Leafriver (s3577) ■ Spooner-Baudette (s3679)
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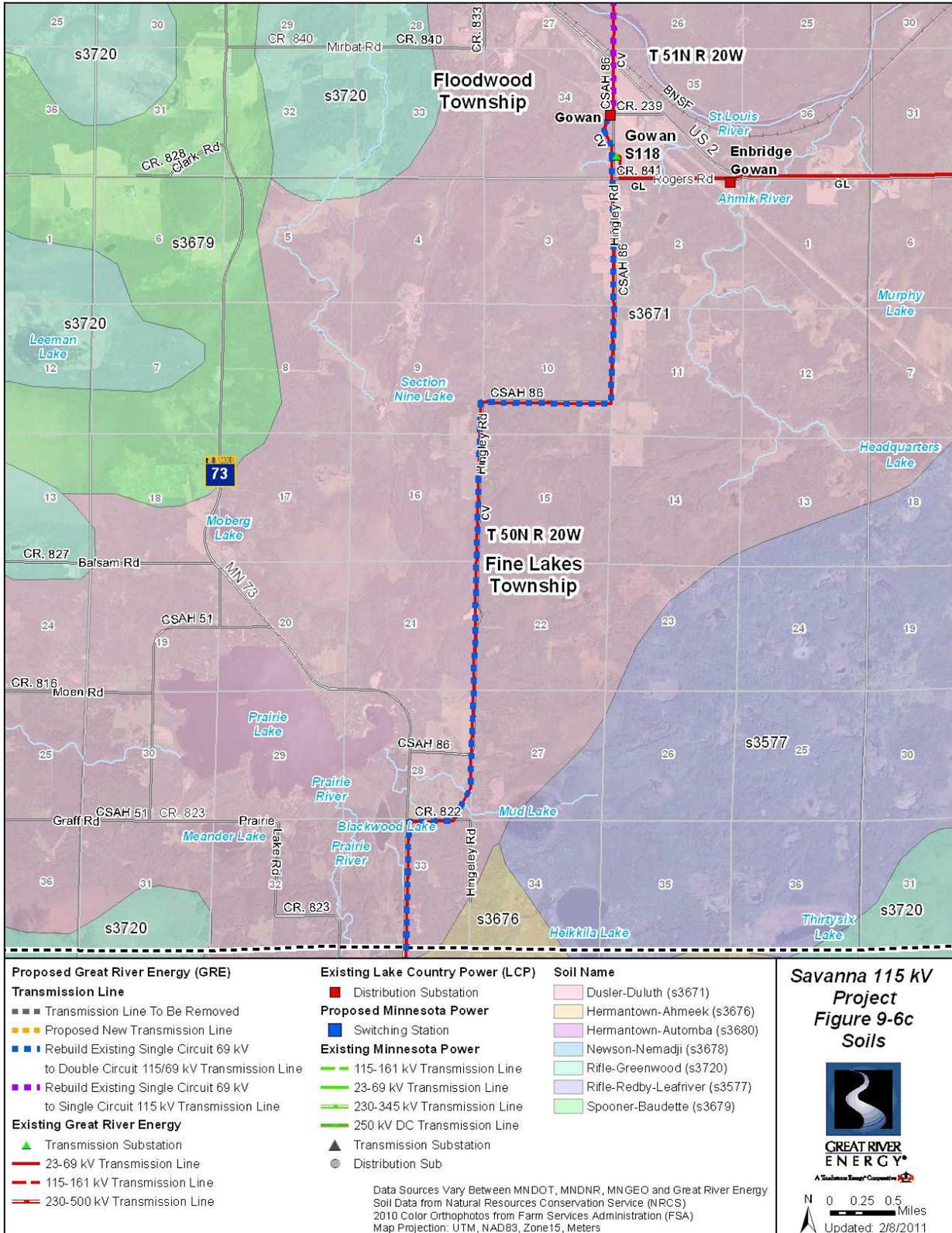
Savanna 115 kV Project
Figure 9-6a
Soils

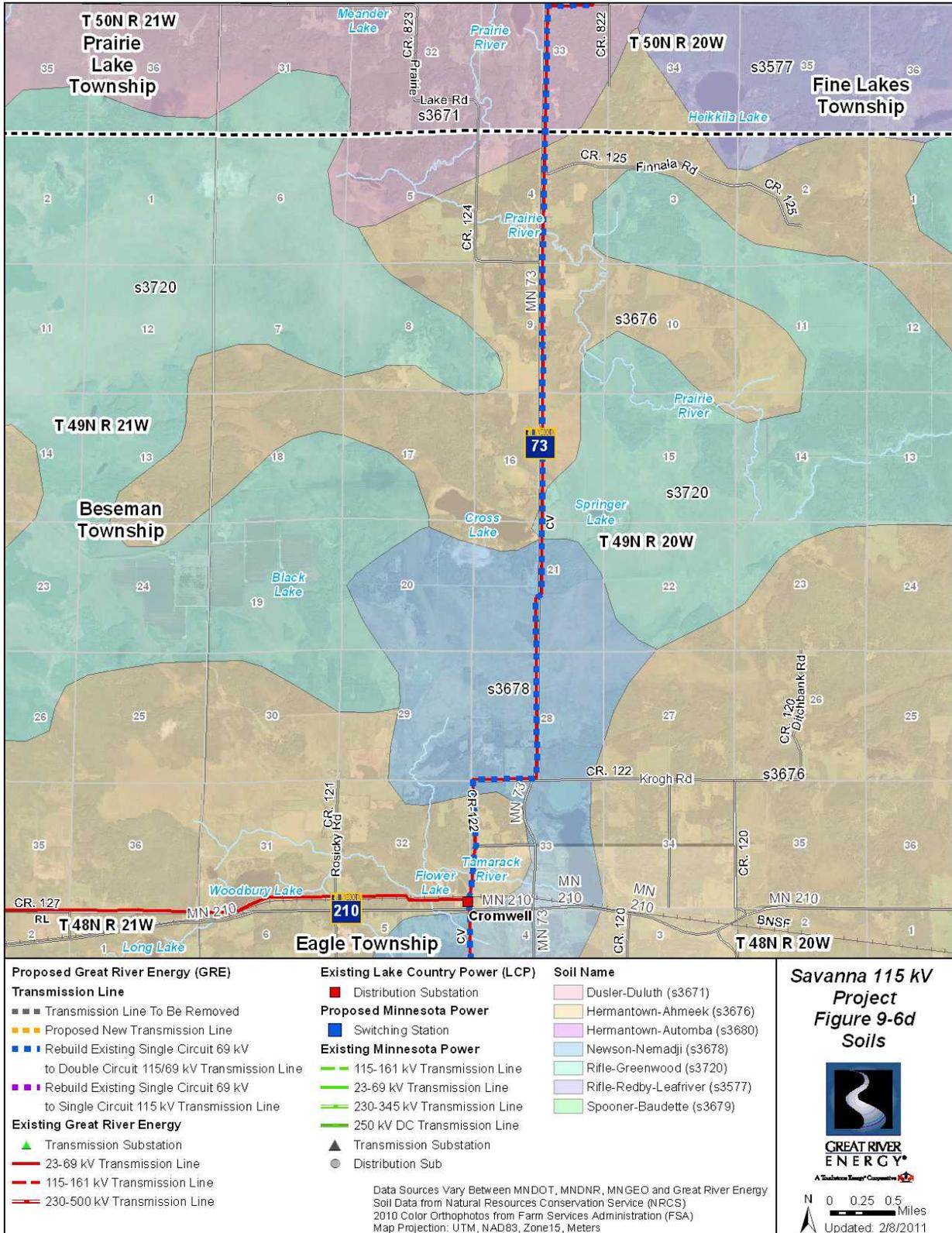


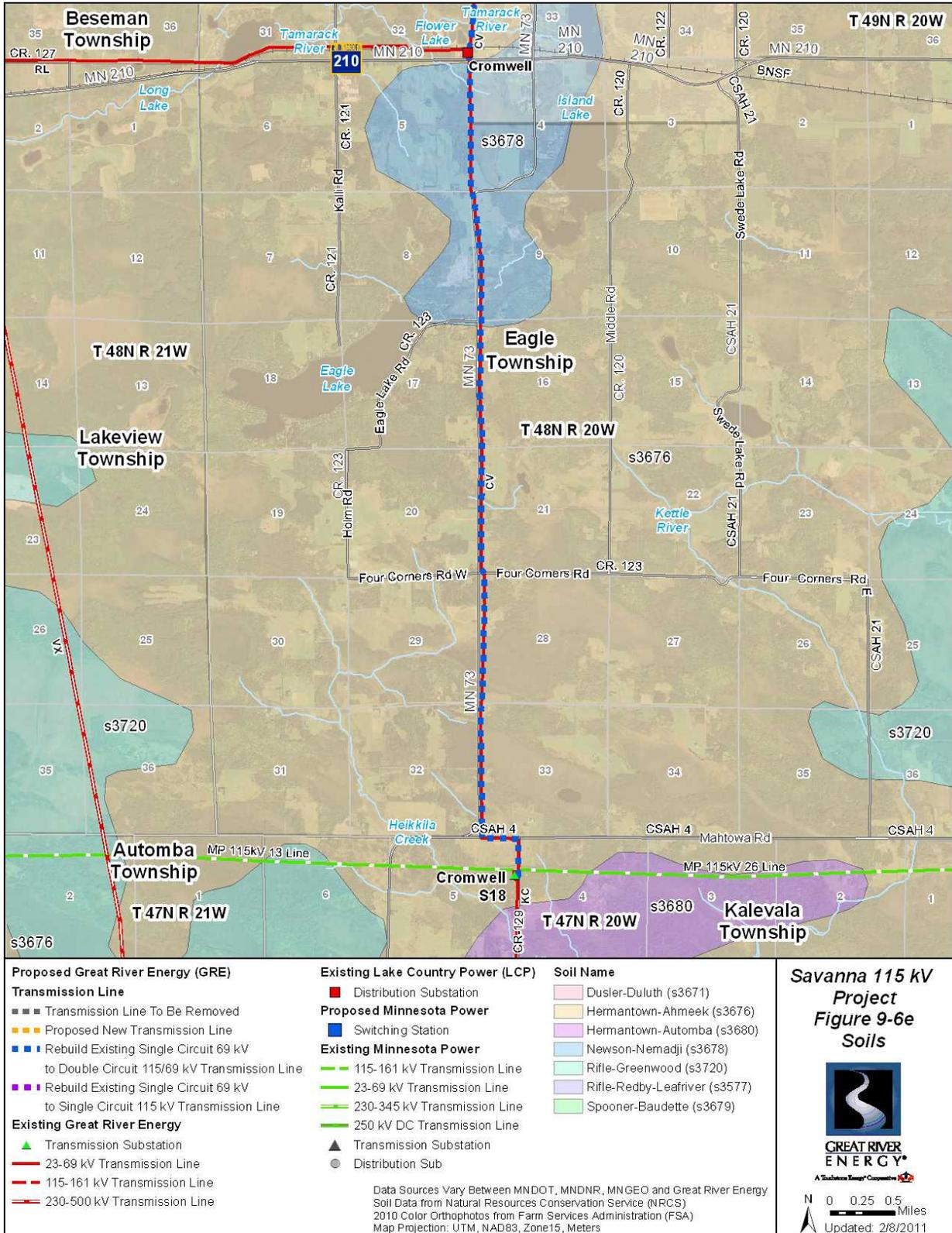
GREAT RIVER ENERGY
 A Tristram Energy Company

Data Sources Vary Between MNDOT, MNDNR, MNGEO and Great River Energy
 Soil Data from Natural Resources Conservation Service (NRCS)
 2010 Color Orthophotos from Farm Services Administration (FSA)
 Map Projection: UTM, NAD83, Zone15, Meters

N 0 0.25 0.5 Miles
 Updated: 2/8/2011







Impacts and Mitigation

Potential impacts of construction are compaction of the soil and exposing the soils to wind and water erosion. Impacts to physiographic features should be minimal during and after installation of the transmission line structures and switching station, and these impacts will be short term. There should be no long-term impacts resulting from this Project.

Soils will be revegetated as soon as possible to minimize erosion or some other method used during construction to prevent soil erosion.

Over an acre of soil will be disturbed during the construction of the Savanna Switching Station, therefore a NPDES construction stormwater permit from the MPCA will be required. Minnesota Power will obtain a NPDES permit and will prepare a SWPPP. Erosion control methods and BMPs will be utilized to minimize runoff during construction of the switching station.

If over an acre of soil will be disturbed during the construction of the transmission line, Great River Energy will obtain a NPDES construction stormwater permit from the MPCA and will prepare a SWPPP. Erosion control methods and BMPs will be utilized to minimize runoff during line construction.

9.8 Land Use

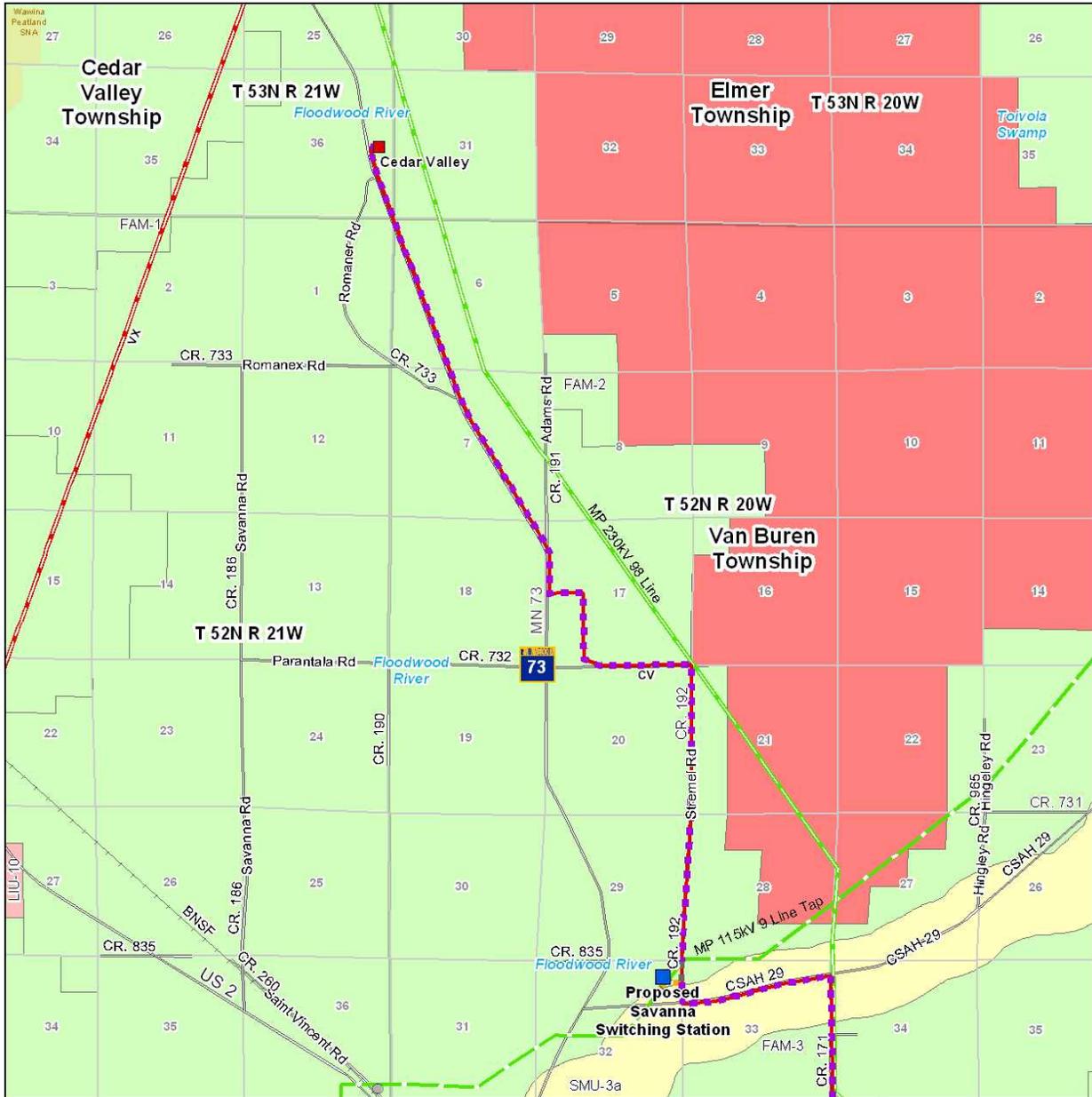
The Project covers a variety of land use patterns in a generally rural environment. The route runs along State Highway 73 continuing along Hingley Rd, County Rd 965 (CSAH 86), Duluth St. Vincent Rd (CSAH 8), Hill Rd, Benson Rd (CR 171), CSAH 29, Stremel Rd (CR 192) and Parantala Rd (CR 732). The route is dominated by forest, with areas of grassland, cropland, wetlands and waters, and residential land uses scattered throughout (Figures 9-3a to 9-3e).

A zoning map of the Project area is provided in Figures 9-7a to 9-7e.

St. Louis County

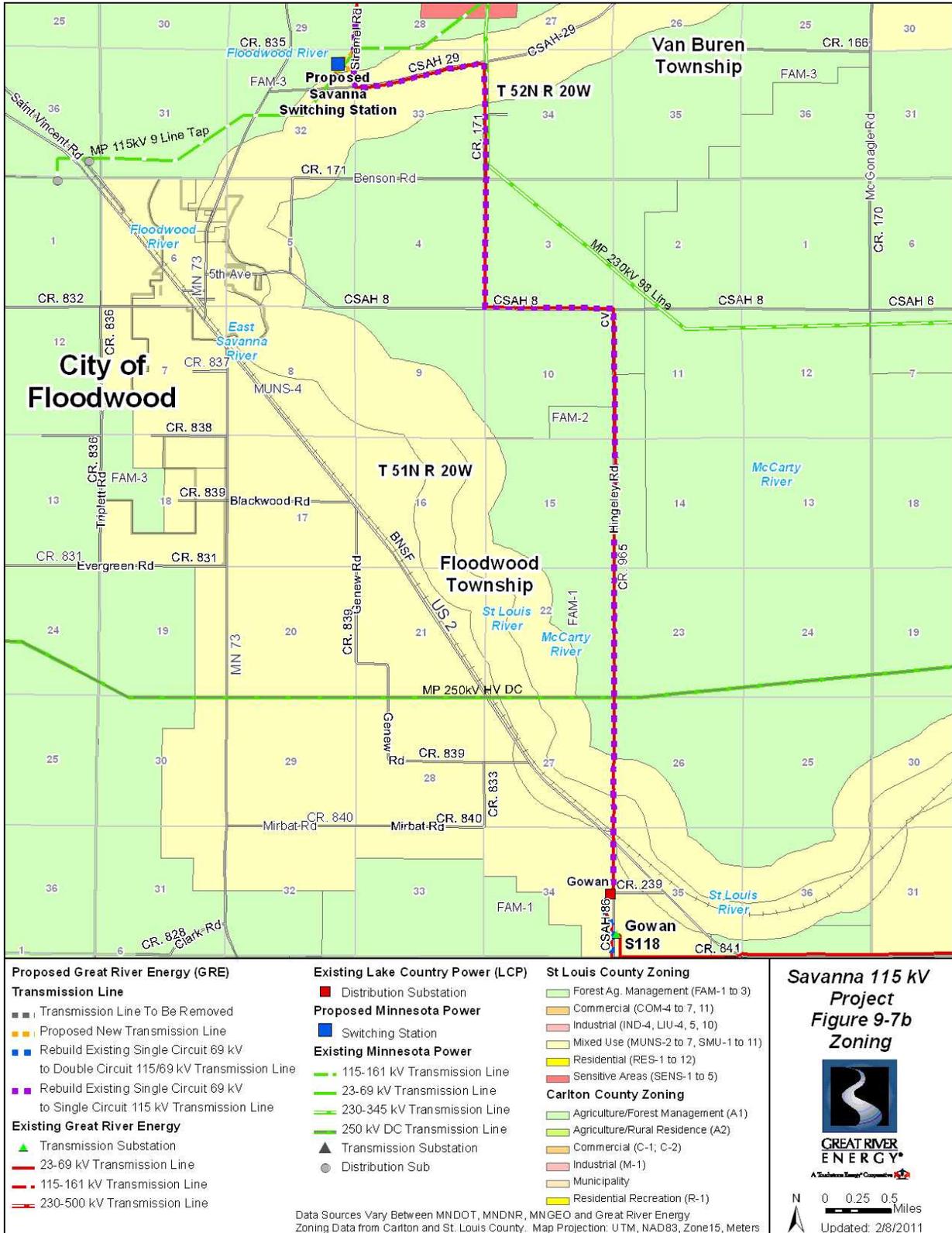
A portion of the proposed Project is located in southwestern St. Louis County. It crosses Cedar Valley, Van Buren, Floodwood and Fine Lakes townships. The St. Louis County current Zoning Map shows that the majority of the route crosses areas with zoning classifications of Forest Agricultural Management and Mixed Use (Multiple Use Non-Shoreland), with some Residential areas associated with lakes near the St. Louis County/Carlton County border (Figures 9-7a to 9-7c).

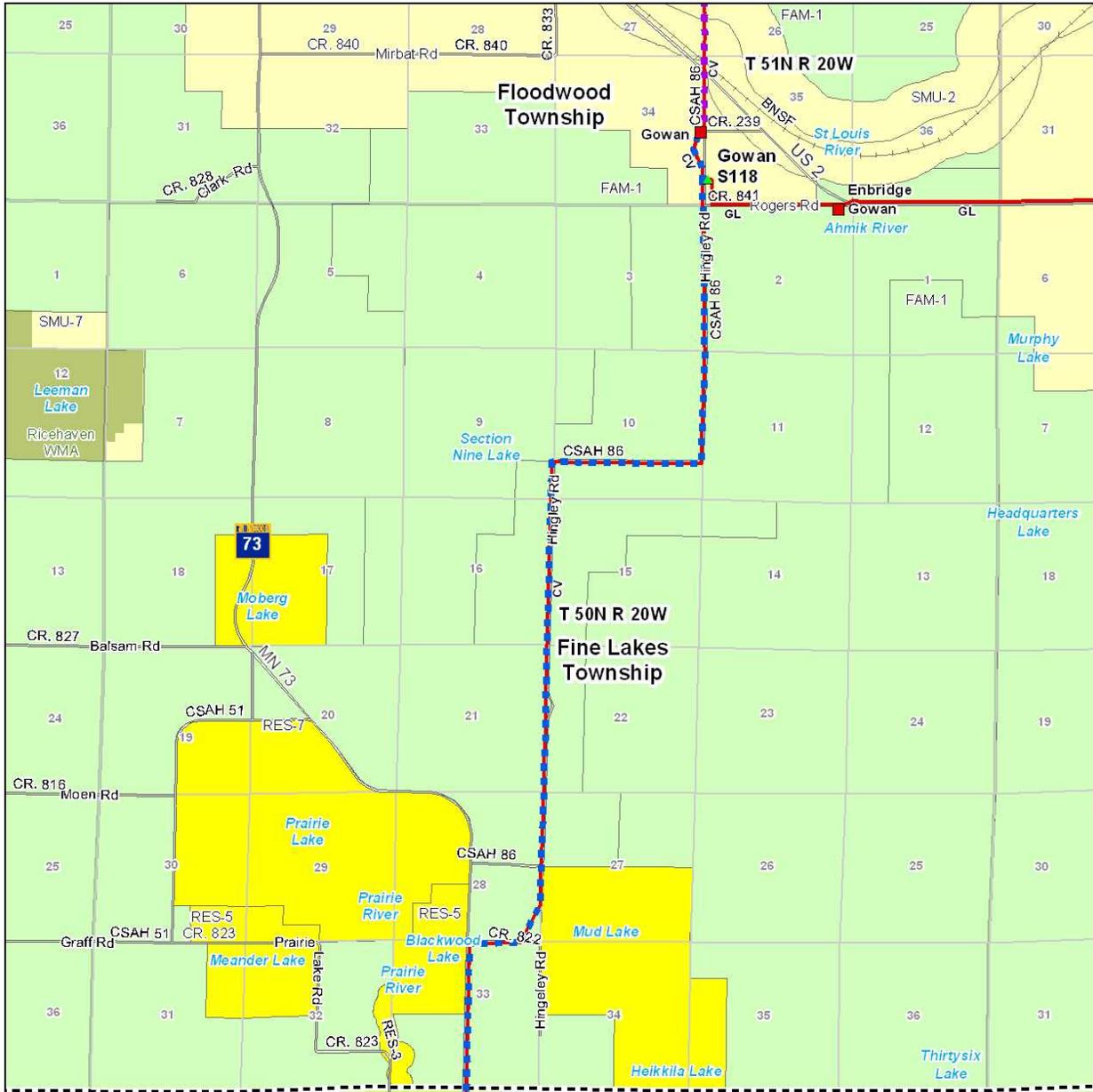
In the vicinity of the proposed route, the St. Louis River is defined as a Shoreland Mixed Use zoning district in St. Louis County. The proposed crossing of the St. Louis River is in an existing corridor and complies with the zoning district use restrictions.



<p>Proposed Great River Energy (GRE) Transmission Line</p> <ul style="list-style-type: none"> Transmission Line To Be Removed Proposed New Transmission Line Rebuild Existing Single Circuit 69 kV to Double Circuit 115/69 kV Transmission Line Rebuild Existing Single Circuit 69 kV to Single Circuit 115 kV Transmission Line <p>Existing Great River Energy</p> <ul style="list-style-type: none"> Transmission Substation 23-69 kV Transmission Line 115-161 kV Transmission Line 230-500 kV Transmission Line 	<p>Existing Lake Country Power (LCP)</p> <ul style="list-style-type: none"> Distribution Substation <p>Proposed Minnesota Power</p> <ul style="list-style-type: none"> Switching Station <p>Existing Minnesota Power</p> <ul style="list-style-type: none"> 115-161 kV Transmission Line 23-69 kV Transmission Line 230-345 kV Transmission Line 250 kV DC Transmission Line Transmission Substation Distribution Sub 	<p>St Louis County Zoning</p> <ul style="list-style-type: none"> Forest Ag. Management (FAM-1 to 3) Commercial (COM-4 to 7, 11) Industrial (IND-4, LIU-4, 5, 10) Mixed Use (MUNS-2 to 7, SMU-1 to 11) Residential (RES-1 to 12) Sensitive Areas (SENS-1 to 5) <p>Carlton County Zoning</p> <ul style="list-style-type: none"> Agriculture/Forest Management (A1) Agriculture/Rural Residence (A2) Commercial (C-1; C-2) Industrial (M-1) Municipality Residential Recreation (R-1) 	<p>Savanna 115 kV Project Figure 9-7a Zoning</p>  <p>GREAT RIVER ENERGY A Exelon Energy Company</p> <p>N 0 0.25 0.5 Miles Updated: 2/8/2011</p>
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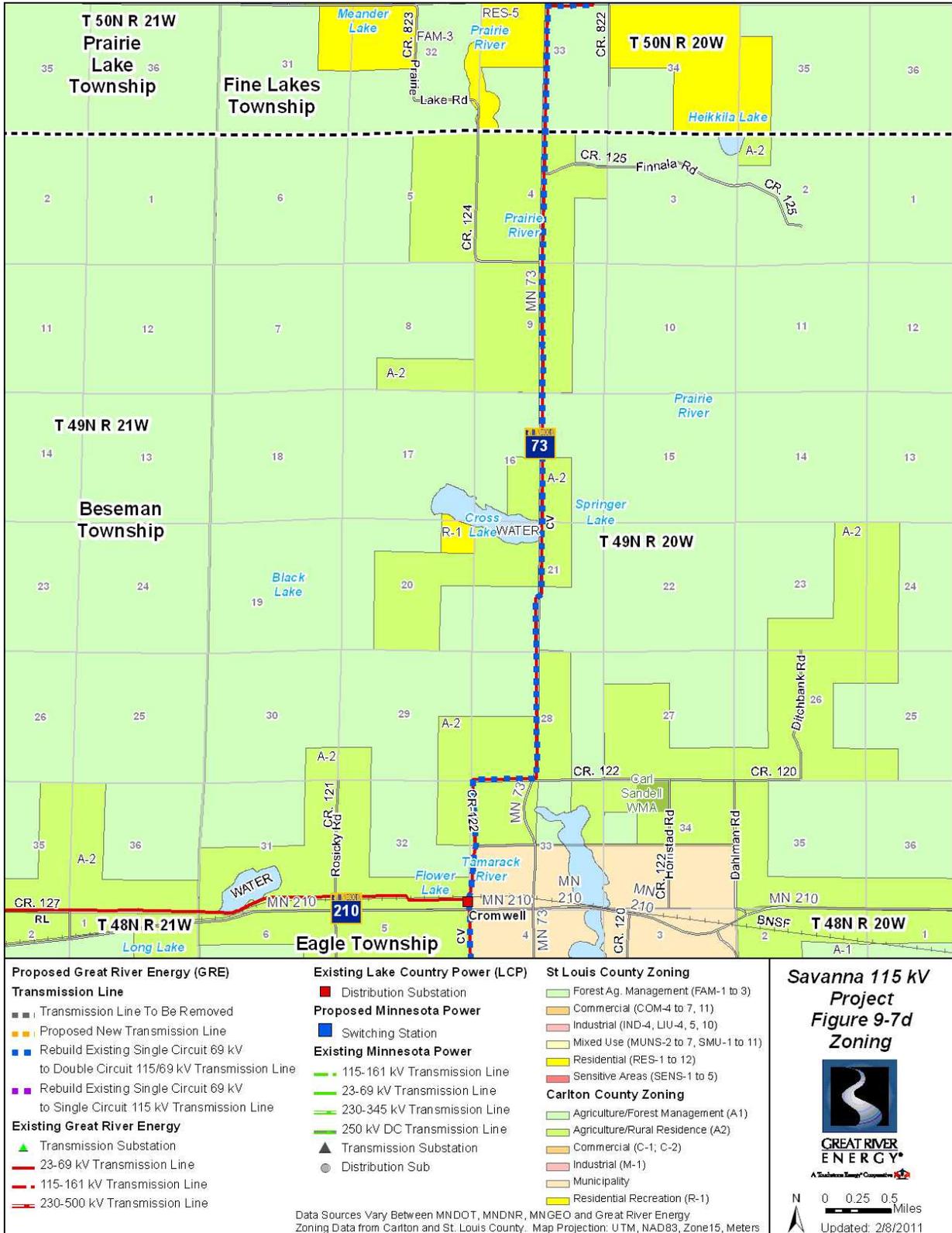
Data Sources Vary Between MNDOT, MNDNR, MNGEO and Great River Energy
Zoning Data from Carlton and St. Louis County. Map Projection: UTM, NAD83, Zone15, Meters

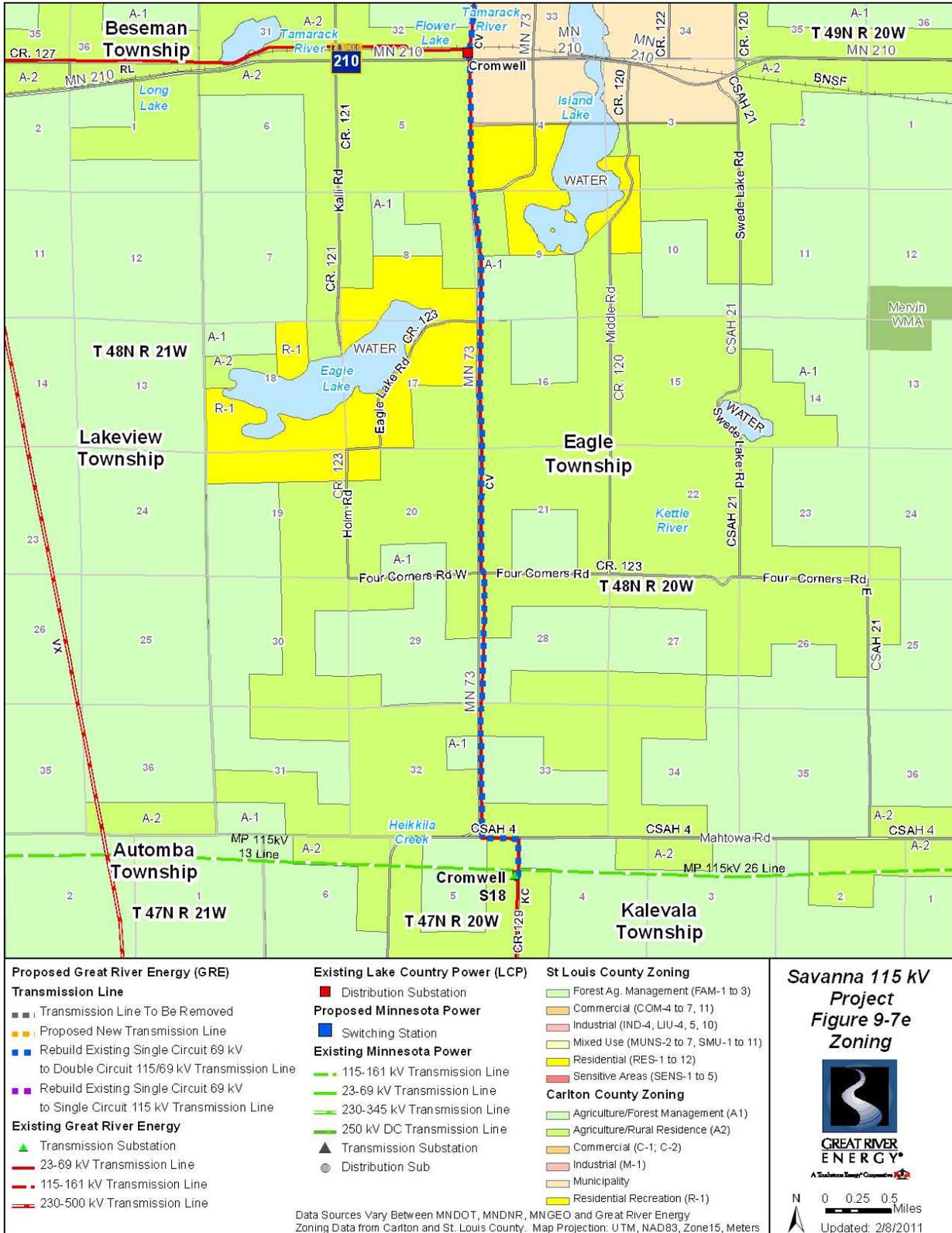




<p>Proposed Great River Energy (GRE)</p> <p>Transmission Line</p> <ul style="list-style-type: none"> ■ Transmission Line To Be Removed ■ Proposed New Transmission Line ■ Rebuild Existing Single Circuit 69 kV to Double Circuit 115/69 kV Transmission Line ■ Rebuild Existing Single Circuit 69 kV to Single Circuit 115 kV Transmission Line <p>Existing Great River Energy</p> <ul style="list-style-type: none"> ▲ Transmission Substation — 23-69 kV Transmission Line — 115-161 kV Transmission Line — 230-500 kV Transmission Line 	<p>Existing Lake Country Power (LCP)</p> <ul style="list-style-type: none"> ■ Distribution Substation <p>Proposed Minnesota Power</p> <ul style="list-style-type: none"> ■ Switching Station <p>Existing Minnesota Power</p> <ul style="list-style-type: none"> — 115-161 kV Transmission Line — 23-69 kV Transmission Line — 230-345 kV Transmission Line — 250 kV DC Transmission Line <p>▲ Transmission Substation</p> <p>● Distribution Sub</p>	<p>St Louis County Zoning</p> <ul style="list-style-type: none"> ■ Forest Ag. Management (FAM-1 to 3) ■ Commercial (COM-4 to 7, 11) ■ Industrial (IND-4, LIU-4, 5, 10) ■ Mixed Use (MUNS-2 to 7, SMU-1 to 11) ■ Residential (RES-1 to 12) ■ Sensitive Areas (SENS-1 to 5) <p>Carlton County Zoning</p> <ul style="list-style-type: none"> ■ Agriculture/Forest Management (A1) ■ Agriculture/Rural Residence (A2) ■ Commercial (C-1; C-2) ■ Industrial (M-1) ■ Municipality ■ Residential Recreation (R-1) 	<p>Savanna 115 kV Project Figure 9-7c Zoning</p>  <p>GREAT RIVER ENERGY A Business Energy Cooperative</p> <p>N 0 0.25 0.5 Miles</p> <p>Updated: 2/8/2011</p>
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Data Sources Vary Between MNDOT, MNDNR, MNGEO and Great River Energy
Zoning Data from Carlton and St. Louis County. Map Projection: UTM, NAD83, Zone15, Meters





Carlton County

The proposed route crosses northwestern Carlton County in Eagle and Kalevala townships. According to the Carlton County Zoning Map, the majority of the route crosses areas with zoning classifications of Agricultural/Forest Management (A-1) and Agriculture/Rural Residential (A-2). There is also a Municipality (City of Cromwell) and a small portion of Recreation Residential (R-1) at the south end of the Project (Figures 9-7d and 9-7e).

Red Clover Township is unincorporated and has no zoning ordinance. Therefore, Carlton County zoning applies.

Impacts and Mitigation

Impacts to land use as a result of the Project are expected to be minimal. Because the route follows an existing transmission line, construction within transmission ROW will minimize land use conflicts. Construction of the facility would not change the possible land uses for any area.

No impacts to residential, commercial or industrial land uses are anticipated; therefore no mitigation is proposed.

10 APPLICATION OF CRITERIA

10.1 Certificate of Need

The Minnesota Public Utilities Commission has established in its rules (Minn. Rules 7849.0120) the criteria that it will apply to determine whether an applicant has established that a new proposed large energy facility is needed. Great River Energy and Minnesota Power have described in this Application the reasons why a Certificate of Need should be granted to build the Savanna 115 kV Switching Station, the Cedar Valley to Savanna 115 kV line, the Savanna to Cromwell 115 kV line, rebuild the Cromwell to Gowan 69 kV lines, and upgrade the associated existing facilities as required. Those reasons are readily apparent and are summarized here.

10.1.1 Denial Would Adversely Affect the Energy Supply

The region generally bounded by Duluth, Grand Rapids, and Brainerd (including the cities and towns of Cromwell, Mahtowa, McGregor, Tamarack, Aitkin, Palisade, Floodwood, Gowan, and Cedar Valley) has experienced moderate growth in electric demand since 2005. This increasing demand is leading to electric reliability concerns to the 69 kV and 115 kV transmission systems that serve the area. Both of these systems have reached their capacity to handle additional loading. Any additional demand placed on these systems, including projected industrial expansion in the City of Floodwood, would exacerbate these reliability problems and potentially lead to line overloads and inability to maintain adequate system voltage.

The upgrades to the area transmission system proposed in the Savanna Project are designed to address the low voltage concerns that threaten to jeopardize reliable electrical service to the area consumers. If voltage is not maintained within acceptable limits, electric appliances and lighting will not perform as expected and could potentially be damaged. Another reliability concern that is addressed by the Project is the radial feed to the Floodwood area via the 115 kV 9 Line Tap. With the significant industrial load growth projected for the area, a second transmission feed is necessary to maintain reliable electric service. Additionally, the 69 kV line proposed to be rebuilt was constructed during the late 1950s and is nearing the end of its useful life.

Load growth is occurring in the Affected Load Centers. The Applicants' forecasts are reasonable and they are supported by both the historic data and load forecasts. This growth is not the result of promotional activities by the Applicants. There is a demonstrated need for improved service in the area.

10.1.2 There is No Reasonable and Prudent Alternative

The proposed Project involves the rebuild of existing lines. There is no less expensive way to increase the capacity of the system. The impact to the environment and to human settlement due to the new lines will be very minimal because there already are transmission lines in the same location. The construction of the new lines will be a reliable solution because the lines will operate nearly continuously for decades.

10.1.3 The Project will Protect the Environment and Provide Benefits

The line follows an existing ROW. Minimal, if any, new ROW will be required if the Commission approves the existing route. The majority of the existing line is located along county, state and U.S. highways. Rivers and waterbodies will be crossed in the places the line presently crosses them. The Applicants are working with the DNR, USFWS, and other agencies to ensure that natural resources are protected.

There can be no doubt that the new line will benefit customers in the service area by ensuring an adequate power supply for years to come.

10.1.4 The Project will Comply with All Applicable Requirements

The Applicants have identified the other permits and approvals that may be required for the Project in Section 2.5. The Applicants have demonstrated that they will comply with all applicable requirements and obtain all necessary permits.

10.2 Route Permit

According to Minn. Stat. § 216E.02, subd. 1, it is the policy of the state of Minnesota to locate high voltage transmission lines in an orderly manner that minimizes adverse human and environmental impacts and ensures continuing electric power system reliability and integrity. The Commission has promulgated standards and criteria for issuing route permits (Minn. Rules 7850.4000). That rule provides that the Commission shall issue route permits for high voltage transmission lines that are consistent with state goals to conserve resources, minimize environmental impacts and impacts to human settlement, minimize land use conflicts, and ensure the state's electric energy security through efficient, cost-effective transmission infrastructure.

The 115 kV transmission proposed for the Savanna Project satisfies all the criteria that are applied in evaluating a new transmission line project. Following an existing transmission line route, as these lines do, conserves resources and minimizes environmental impacts and other impacts. Constructing the lines at 115 kV capability helps ensure a reliable and secure power source in the area served by these lines. It is less expensive and less intrusive than other alternatives.

For all the reasons described in this Application, and summarized in Section 10.1 above regarding the reasons why a Certificate of Need should be issued, the Commission should also issue a Route Permit.

10.3 Conclusion

Great River Energy and Minnesota Power respectfully request that the Commission issue a Certificate of Need authorizing construction of the Savanna 115 kV Switching Station and approximately 37 total miles of 115 kV transmission lines between the Cedar Valley Substation, the Savanna Switching Station, and the Cromwell Substation.

In addition, Great River Energy and Minnesota Power request that the Commission issue a Route Permit at the same time designating the site for the Savanna Switching Station and the route for the 115 kV lines. The Applicants request that the permit designate the existing route that the present 69 kV lines follow. The Applicants request that the Commission designate a route wider than the necessary ROW, to allow flexibility in determining the precise location of the transmission centerline and structures.

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