Appendix G:
Agricultural Impacts Mitigation Plan (AIMP)

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AGRICULTURAL IMPACT MITIGATION PLAN

CapX2020 345 kV Electric Transmission Projects in Minnesota

CapX2020

June 2009

AGRICULTURAL IMPACT MITIGATION PLAN

CapX2020

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AGRICULTURAL IMPACT MITIGATION PLAN

CapX2020

Purpose

This Agricultural Impact Mitigation Plan ("AIMP" or 'the plan') was developed by Northern States Power Company, a Minnesota corporation and wholly-owned subsidiary of Xcel Energy Inc., and Great River Energy, a Minnesota generation and transmission cooperative (together, referred to as "the Utilities"), representing the CapX2020 utility consortium and with the Minnesota Department of Agriculture ("MDA"). The overall objective of this AIMP is to identify measures the Utilities will take to avoid, mitigate, repair and/or provide compensation for impacts that may result from 345 kV electric transmission line construction of the CapX2020 projects on Agricultural Land in Minnesota.

CapX2020 ("CapX2020") is a joint initiative of 11 transmission-owning utilities in Minnesota and the surrounding region. The purpose of CapX2020 is to study, develop, permit and construct electric transmission infrastructure as needed to implement long-term and cost-effective solutions for customers to meet the growth in energy use expected by the year 2020. The three CapX2020 projects included in this AIMP are described as:

1) the 345 kV transmission line from Brookings County, South Dakota to Hampton, Minnesota;

2) the 345 kV transmission line from Monticello, Minnesota to St. Cloud to the Fargo area, North Dakota; and

3) the 345 kV transmission line from Hampton, Minnesota to Rochester to La Crosse, Wisconsin.

Collectively, these three transmission lines are referred to as the "CapX2020 Projects".

The construction standards and policies in this plan apply only to construction activities occurring partially or wholly on privately owned Agricultural Land. The measures do not apply to construction activities occurring entirely on public rights-of-way, railroad rights-of-way, publicly owned land, or private land that is not Agricultural Land. The Utilities will, however, adhere to the same construction standards relating to the repair of agricultural tile (Item No. 3 in the AIMP) when Tiles are encountered on public highway rights-of-way, railroad rights-of-way, or publicly or privately owned land.

Appendix B of this AIMP applies only to Organic Agricultural Land as described in the National Organic Program Rules, 7 CFR Parts 205.100, 205.202, and 205.101.

Unless the Easement or other agreement, regardless of nature, between the Utilities and the Landowner or Tenant specifically provides to the contrary, the mitigative actions specified in the construction standards and policies set forth in this AIMP will be implemented in accordance with the General Provisions.

General Provisions

The mitigative actions are subject to change by Landowners or Tenants, provided such changes are negotiated with and acceptable to the Utilities.

Certain provisions of this AIMP require the Utilities to consult with the Landowner and Tenant of a property. The Utilities will engage in a good faith effort to secure the agreement of both Landowner and Tenant in such cases.

Unless otherwise specified, the Utilities will retain qualified contractors to execute mitigative actions. However, the Utilities may negotiate with Landowners or Tenants to carry out the mitigative actions that Landowners or Tenants wish to perform themselves.

Mitigative actions employed by the Utilities pursuant to this AIMP, unless otherwise specified in this AIMP or in an Easement or other agreement negotiated with an individual Landowner or Tenant, will be implemented within 45 days following completion of Final Clean-up on an affected property, weather permitting, or unless otherwise delayed by mutual agreement between Landowner or Tenant and Utility. Temporary repairs will be made by the Utilities during construction as needed to minimize the risk of additional property damage or interference with the Landowner's or Tenant's access to or use of the property that may result from an extended time period to implement mitigative actions.

The Utilities will implement the mitigative actions contained in this AIMP to the extent that they do not conflict with the requirements of any applicable federal and/or state rules and regulations and other permits and approvals that are obtained by the Utilities for the project or they are not determined to be unenforceable by reason of other requirements of federal and state permits issued for the project. To the extent a mitigative action required by this agreement is determined to be unenforceable in the future due to requirements of other federal or state permits issued for the project, the Utilities will so inform the Landowner or Tenant and will work with them to develop a reasonable alternative mitigative action.

Prior to the construction of the transmission line, the Utilities will provide each Landowner and Tenant with a telephone number and address which can be used to contact the Utilities, both during and following the completion of construction, regarding the agricultural impact mitigation work which is performed on their property or other construction-related matter. If the contact information changes at any time before completion of Final Clean-up and/or after the completion of construction, the Utilities will provide the Landowner and Tenant with updated contact information. The Utilities will respond to Landowner and Tenant telephone calls and correspondence within a reasonable time.

The Utilities will use good faith efforts to obtain a written acknowledgement of completion from each Landowner and Tenant upon the completion of Final Clean-up on their respective property.

If any provision of this AIMP is held to be unenforceable, no other provision will be affected by that holding, and the remainder of the AIMP will be interpreted as if it did not contain the unenforceable provision.

Mitigative Actions

The Utilities will reasonably restore or compensate Landowners and/or Tenants, as appropriate, for damages caused by the Utilities as a result of transmission line construction, and as outlined in this plan. The decision to restore land or compensate Landowners will be made by the Utilities after discussion with the Landowner or Tenant.

1. Pole Placement

During the design of the project, the Utilities' engineering, land rights and permitting staff will work together to address pole placement issues. Utilities' staff will work with Landowners on pole placement. When the preliminary design is complete, the land rights agents will review the staked pole locations with the Landowners.

2. Soil and Rock Removal for Bored Holes

Any excess soil and rock will be removed from the site unless otherwise requested by the Landowner.

3. Damaged and Adversely Affected Tile

The Utilities will contact affected Landowners or Tenants for their knowledge of Tile locations prior to the transmission line's installation. Utilities will make every attempt to probe for Tile if the Landowner does not know if Tile is located in the proposed pole location. Tile that is damaged, cut, or removed as a result of this probe will be immediately repaired. The repair will be reported to the Inspector.

If Tile is damaged by the transmission line installation, the Tile will be repaired in a manner that restores the Tile's operating condition at the point of repair. If Tiles on or adjacent to the transmission line's construction area are adversely affected by the construction of the transmission line, the Utilities will take such actions as are necessary to restore the functioning of the Tile, including the relocation, reconfiguration, and replacement of the existing Tile. The affected Landowner or Tenant may elect to negotiate a fair settlement with the Utilities for the Landowner or Tenant to undertake the responsibility for repair, relocation, reconfiguration, or replacement of the damaged Tile. In the event the Landowner or Tenant chooses to undertake the responsibility for repair, relocation, reconfiguration, or replacement of the damaged Tile, the Utilities will not be responsible for correcting Tile repairs after completion of the transmission line (the Utilities are responsible for correcting Tile repairs after completion of the transmission line, provided the repairs were made by the Utilities or their agents or designees).

Where the damaged Tile is repaired by the Utilities, the following standards and policies will apply to the Title repair:

A. Tiles will be repaired with materials of the same or better quality as that which was damaged.

B. If water is flowing through a damaged Tile, temporary repairs will be promptly installed and maintained until such time that permanent repairs can be made.

C. Before completing permanent Tile repairs, Tiles will be examined within the work area to check for Tile that might have been damaged by construction equipment. If Tiles are found to be damaged, they will be repaired so they operate as well after construction as before construction began.

D. The Utilities will make efforts to complete permanent Tile repairs within a reasonable timeframe after Final Clean-up, taking into account weather and soil conditions.

E. Following completion of the Final Clean-up and damage settlement, the Utilities will be responsible for correcting and repairing Tile breaks, or other damages to Tile systems that are discovered on the Right-of-Way to the extent that such breaks are the result of transmission line construction. These damages are usually discovered after the first significant rain event. The Utilities will not be responsible for Tile repairs the Utilities have paid the Landowner or Tenant to perform.

4. Installation of Additional Tiles

The Utilities will be responsible for installing such additional Tile and other drainage measures as are necessary to properly drain wet areas on the Right-of-Way caused by the construction of the transmission line.

5. Construction Debris

Construction-related debris and material which are not an integral part of the transmission line, and which have been placed there by the Utilities, will be removed from the Landowner's property at the Utilities' cost. Such material to be removed would include excess construction materials or litter generated by the construction crews.

6. Compaction, Rutting, Fertilization, Liming, and Soil Restoration

A. Compaction will be alleviated as needed on Cropland traversed by construction equipment. Cropland that has been compacted will be plowed using appropriate deep-tillage and draft equipment. Alleviation of compaction of the topsoil will be performed during suitable weather conditions, and must not be performed when weather conditions have caused the soil to become so wet that activity to alleviate compaction would damage the future production capacity of the land as determined by the Agricultural Monitor.

B. The Utilities will restore rutted land to as near as practical to its pre-construction condition.

C. If there is a dispute between the Landowner or Tenant and the Utilities as to what areas need to be ripped or chiseled, the depth at which compacted areas should be

ripped or chiseled, or the necessity or rates of lime, fertilizer, and organic material application, the Agricultural Monitor's opinion will be considered by the Utilities.

7. Damaged Soil Conservation Practices

Soil conservation practices such as terraces and grassed waterways which are damaged by the transmission line's construction, will be restored to their pre-construction condition.

8. Weed Control

On land which is owned by Utilities for substation facilities, the Utilities will work with Landowners if requested on weed control activities outside of the substations with the intent to not allow the spread of weeds onto adjacent Agricultural Land. Any weed control spraying will be in accordance with State of Minnesota regulations.

9. Irrigation Systems

A. If the transmission line and/or temporary work areas intersect an operational (or soon to be operational) spray irrigation system, the Utilities will establish with the Landowner or Tenant, an acceptable amount of time the irrigation system may be out of service.

B. If, as a result of the transmission line construction activities, an irrigation system interruption results in crop damages, either on the Right-of-Way or off the Right-of-Way, compensation of Landowners and/or Tenants, as appropriate, will be determined as described in section 11 of this AIMP.

C. If it is feasible and mutually acceptable to the Utilities and the Landowner or Tenant, temporary measures will be implemented to allow an irrigation system to continue to operate across land on which the transmission line is also being constructed. Utilities will work with the Landowner or Tenant to identify a preferable construction time.

10. Temporary Roads

The location of temporary roads to be used for construction purposes will be discussed with the Landowner or Tenant.

A. The temporary roads will be designed so as to not impede proper drainage and will be built to mitigate soil erosion on or near the temporary roads.

B. Upon abandonment, temporary roads may be left intact through mutual agreement of the Landowner or Tenant and the Utilities unless otherwise restricted by federal, state or local regulations.

C. If a temporary road is to be removed, the Agricultural Land upon which the temporary road is constructed will be returned to its previous use and restored to equivalent condition as existed prior to their construction.

11. Construction in Wet Conditions

If it is necessary to construct during wet conditions, and if the Agricultural Monitor believes conditions are too wet for continued construction, damages which may result from such construction will be paid for by the Utilities and/or appropriate restoration will be conducted. Compensation for Landowners and/or Tenants, as appropriate, will be determined as described in section 12 of this AIMP.

12. Procedures for Determining Construction-Related Damages and Providing Compensation

A. The Utilities will develop and put into place a procedure for the processing of anticipated Landowners' or Tenants' claims for construction-related damages. The procedure will be intended to standardize and minimize Landowner and Tenant concerns in the recovery of damages, to provide a degree of certainty and predictability for Landowners, Tenants and the Utilities, and to foster good relationships among the Utilities, Landowners and their Tenants over the long term.

B. Negotiations between the Utilities and any affected Landowner or Tenant will be voluntary in nature and no party is obligated to follow any particular method for computing the amount of loss for which compensation is sought or paid. The compensation offered is only an offer to settle, and the offer shall not be introduced in any proceeding brought by the Landowner or Tenant to establish the amount of damages the Utilities must pay. In the event the Utilities and a Landowner or Tenant are unable to reach an agreement on the amount of damages, the Landowner or Tenant may seek recourse through mediation.

13. Advance Notice of Access to Private Property

The Utilities will endeavor to provide the Landowner and/or Tenant advanced notice before beginning construction on the property. Prior notice will consist of a personal contact, email, letter or a telephone contact, whereby the Landowner and the Tenant are informed of the Utilities' intent to access the land.

14. Role and Responsibilities of Agricultural Monitor

The Agricultural Monitor will be retained and funded by the Utilities, but will report directly to the MDA. The primary function of the Agricultural Monitor will be to audit the Utilities' compliance with this AIMP. The Agricultural Monitor will not have the authority to direct construction activities and will not have authority to stop construction. The Agricultural Monitor will notify the Utilities' Inspector if he/she believes a compliance issue has been identified. The Agricultural Monitor will have full access to Agricultural Land crossed by the CapX2020 projects and will have the option of

attending meetings where construction on Agricultural Land is discussed. Specific duties of the Agricultural Monitor will include, but are not limited to the following:

1. Participate in preconstruction training activities sponsored by the Utilities.

2. Monitor construction and restoration activities on Agricultural Land for compliance with provisions of this AIMP.

3. Report instances of noncompliance to the Utilities Inspector.

4. Prepare regular compliance reports and submit to MDA, as requested by the MDA.

5. Act as liaison between Landowners and Tenants and MDA, if necessary.

6. Maintain a written log of communications from Landowners and/or Tenants regarding compliance with this AIMP. Report Landowner complaints to the Utilities Inspector and/or Right-of-Way representative.

7. In disputes between Utilities and a Landowner and/or Tenant over restoration, determine if agricultural restoration is reasonably adequate in consultation with the Utilities Inspector.

15. Qualifications and Selection of Agricultural Monitor

The Agricultural Monitor will have a bachelor's degree in agronomy, soil science or equivalent work experience. The Agricultural Monitor will have demonstrated practical experience with pipeline or electric transmission line construction and restoration on Agricultural Land. Final selection of the Agricultural Monitor will be a joint decision between the MDA and the Utilities.

16. Role of the Utilities Inspector

The Utilities Inspector will:

1. Be full-time member of the Utilities inspection team.

2. Be responsible for verifying the Utilities compliance with provisions of this AIMP during construction.

3. Work collaboratively with other Utilities Inspectors, Right-of-Way agents, and the Agricultural Monitor in achieving compliance with this AIMP.

4. Observe construction activities on Agricultural Land on a regular basis.

5. Have the authority to stop construction activities that are determined to be out of compliance with provisions of this AIMP.

6. Document instances of noncompliance and work with construction personnel to identify and implement appropriate corrective actions as needed.

7. Provide construction personnel with training on provisions of this AIMP before construction begins.

8. Provide construction personnel with field training on specific topics as needed.

Appendix A: **Definitions**

Agricultural Land	Land that is actively managed for cropland, hayland, or pasture, and land in government set-aside programs.
Agricultural Monitor	Monitor retained and funded by the Utilities, reporting directly to the Minnesota Department of Agriculture ("MDA") and responsible for auditing the Utilities' compliance with provisions of this AIMP.
Cropland	Land actively managed for growing row crops, small grains, or hay.
Easement	The agreement(s) and/or interest in privately owned Agricultural Land held by the Utilities by virtue of which it has the right to construct, operate and maintain the transmission line together with such other rights and obligations as may be set forth in such agreement.
Final Clean-up	Transmission line activity that occurs after the power line has been constructed. Final Clean-up activities include but are not limited to: removal of construction debris, de-compaction of soil as required, installation of permanent erosion control structures, final grading, and restoration of fences and required reseeding. Once Final Clean-up is finished, Landowners will be contacted to settle all damage issues and will be provided a form to sign confirming final settlement.
Landowner	Person(s) holding legal title to Agricultural Land on the transmission line route from whom the Utilities is seeking, or has obtained, a temporary or permanent Easement, or their representatives.
Non-Agricultural Land	Any land that is not "Agricultural Land" as defined above.
Right-of-Way	The Agricultural Land included in permanent and temporary Easements which the Utilities acquires for the purpose of constructing, operating and maintaining the transmission line.
Tenant	Any Person lawfully renting or sharing land for agricultural production which makes up the "Right-of-Way" as defined in this AIMP.
Tile	Artificial subsurface drainage system.
Topsoil	The uppermost horizon (layer) of the soil, typically with the darkest color and highest content of organic matter.
Utilities Inspector	Full-time on-site inspector retained by the Utilities to verify compliance with requirements of this AIMP during construction of the transmission line. The Inspector will have demonstrated experience with transmission line construction on Agricultural Land.

Appendix B: Mitigative Actions for Organic Agricultural Land

Introduction

The Utilities recognize that Organic Agricultural Land is a unique feature of the landscape and will treat this land with the same level of care as other sensitive environmental features. This Appendix identifies mitigation measures that apply specifically to farms that are Organic Certified or farms that are in active transition to become Organic Certified, and is intended to address the unique management and certification requirements of these operations. All protections provided in the Agricultural Impact Mitigation Plan will also be provided to Organic Agricultural Land in addition to the provisions of this Appendix.

The provisions of this Appendix will apply to Organic Agricultural Land for which the Landowner or Tenant has provided to the Utilities a true, correct and current version of the Organic System Plan within 60 days after the signing of the Easement for such land or 60 days after the issuance of a Route Permit to the Utilities by the PUC, whichever is sooner, or, in the event the Easement is signed later than 60 days after the issuance of the Route Permit. The provisions of this Appendix are applicable when the Organic System Plan is provided to the Utilities at the time of the signing of the Easement.

Organic System Plan

The Utilities recognize the importance of the individualized Organic System Plan (OSP) to the Organic Certification process. The Utilities will work with the Landowner or Tenant, the Landowner or Tenant's Certifying Agent, and/or a mutually acceptable third-party Organic consultant to identify site-specific construction practices that will minimize the potential for Decertification as a result of construction activities. Possible practices may include, but are not limited to: equipment cleaning, planting a deep-rooted cover crop in lieu of mechanical decompaction, applications of composted manure or rock phosphate, preventing the introduction of disease vectors from tobacco use, restoration and replacement of beneficial bird and insect habitat, maintenance of organic buffer zones, use of organic seeds for any cover crop, or similar measures. The Utilities recognizes that Organic System Plans are proprietary in nature and will respect the need for confidentiality.

Prohibited Substances

The Utilities will avoid the application of Prohibited Substances onto Organic Agricultural Land. No herbicides, pesticides, fertilizers or seed will be applied unless requested and approved by the Landowner. Likewise, no refueling, fuel or lubricant storage or routine equipment maintenance will be allowed on Organic Agricultural Land. Equipment will be checked prior to entry to make sure that fuel, hydraulic and lubrication systems are in good working order before working on Organic Agricultural Land. If Prohibited Substances are used on land adjacent to Organic Agricultural Land, these substances will be used in such a way as to prevent them from entering Organic Agricultural Land.

Temporary Road Impacts

Topsoil and subsoil layers that are removed during construction on Organic Agricultural Land for temporary road impacts will be stored separately and replaced in the proper sequence after the transmission line is installed. Unless otherwise specified in the site-specific plan described above, the Utilities will not use this soil for other purposes, including creating access ramps at road crossings. No topsoil or subsoil (other than incidental amounts) may be removed from Organic Agricultural Land. Likewise, Organic Agricultural Land will not be used for storage of soil from non-Organic Agricultural Land.

Erosion Control

On Organic Agricultural Land, the Utilities will, to the extent feasible, implement erosion control methods consistent with the Landowner or Tenant's Organic System Plan. On land adjacent to Organic Agricultural Land, the Utilities' erosion control procedures will be designed so that sediment from adjacent non-Organic Agricultural Land will not flow along the Right-of-Way and be deposited on Organic Agricultural Land. Treated lumber, non-organic hay bales, non-approved metal fence posts, etc. will not be used in erosion control on Organic Agricultural Land.

Weed Control

On Organic Agricultural Land, the Utilities will, to the extent feasible, implement weed control methods consistent with the Landowner's or Tenant's Organic System Plan. Prohibited Substances will not be used in weed control on Organic Agricultural Land. In addition, the Utilities will not use Prohibited Substances in weed control on land adjacent to Organic Agricultural Land in such a way as to allow these materials to drift onto Organic Agricultural Land.

Monitoring

In addition to the responsibilities of the Agricultural Monitor described in the AIMP, the following will apply:

A. The Agricultural Monitor will monitor construction and restoration activities on Organic Agricultural Land for compliance with the provisions of this appendix and will document any activities that may result in Decertification.

B. Instances of non-compliance will be documented according to Independent Organic Inspectors Association protocol consistent with the Landowner's Organic System Plan, and will be made available to the MDA, the Landowner, the Tenant, the Landowner's or Tenant's Certifying Agent, the Utilities Inspector and to the Utilities.

If the Agricultural Monitor is responsible for monitoring activities on Organic Agricultural Land, he/she will be trained, at the Utilities' expense, in organic inspection, by the Independent Organic Inspectors Association, unless the Agricultural Monitor received such training during the previous three years.

Compensation for Construction Damages

The settlement of damages will be based on crop yield and/or crop quality determination and the need for additional restoration measures. Unless the Landowner or Tenant of Organic Agricultural Land and Company agree otherwise, at the Utilities expense, a mutually agreed upon professional agronomist will make crop yield determinations, and the Minnesota Department of Agriculture Fruit and Vegetable Inspection Unit will make crop quality determinations. If the crop yield and/or crop quality determinations indicate the need for soil testing, the testing will be conducted by a commercial laboratory that is properly certified to conduct the necessary tests and is mutually agreeable to the Utilities and the Landowner or Tenant. Field work for soil testing will be conducted by a Professional Soil Scientist or Professional Engineer licensed by the State of Minnesota. The Utilities will be responsible for the cost of sampling, testing and additional restoration activities, if needed. Landowners or Tenants may elect to settle damages with the Utilities in advance of construction on a mutually acceptable basis or to settle after construction based on a mutually agreeable determination of actual damages.

Compensation for Damages Due to Decertification

Should any portion of Organic Agricultural Land be Decertified as a result of construction activities, the settlement of damages will be based on the difference between revenue generated from the land affected before Decertification and after Decertification so long as a good faith effort is made by the Landowner or Tenant to regain Certification.

Definitions

Unless otherwise provided to the contrary in this Appendix, capitalized terms used in this Appendix shall have the meanings provided below and in the AIMP. In the event of a conflict between this Appendix and the AIMP with respect to definitions, the definition provided in this Appendix will prevail but only to the extent such conflicting terms are used in this Appendix. The definition provided for the defined words used herein shall apply to all forms of the words.

Apply	To intentionally or inadvertently spread or distribute any substance onto the exposed surface of the soil.
Certifying Agent	As defined by the National Organic Program Standards, Federal Regulations 7 CFR Part 205.2.
Decertified or Decertification	Loss of Organic Certification.
Organic Agricultural Land	Farms or portions thereof described in 7 CFR Parts 205.100, 205.202, and 205.101.
Organic Buffer Zone	As defined by the National Organic Program Standards, Federal Regulations 7 CFR Part 205.2.
Organic Certification or Organic Certified	As defined by the National Organic Program Standards, Federal Regulations 7 CFR Part 205.100 and 7 CFR Part 205.101.
Organic System Plan	As defined by the National Organic Program Standards, Federal Regulations 7 CFR Part 205.2.
Prohibited Substance	As defined by the National Organic Program Standards, Federal Regulations 7 CFR Part 205.600 through 7 CFR 205.605 using the criteria provided in 7 USC 6517 and 7 USC 6518.

Appendix H:
Minnesota Route Matrix

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Appendix H - Route Data Matrix

	Hampton to Mississippi River		Hampton to North Rochester		North Rochester - Mississippi River		North Rochester to Northern Hills 161 kV		Zumbro Dam Crossing		McCarthy Lake Route Option		La Crescent and Winona Crossings		
	End-To-End Preferred Route	*End-To-End Alternative Route*	*Preferred Route*	*Alternative Route*	*Preferred Route*	*Alternative Route*	*Preferred Route*	*Alternative Route*	*Zumbro Dam Preferred*	*Zumbro Dam Route Option*	*McCarthy Lake Preferred*	*McCarthy Lake Route Option*	*La Crescent crossing via Property Lines*	*La Crescent crossing via I-90*	*Winona Crossing*
General Characteristics and ROW															
Length															
Miles	80.86	90.54	36.10	48.52	44.75	42.02	15.39	17.93	11.90	10.08	2.54	4.77	98.99	97.39	76.54
Feet	426,942	478,079	190,657	256216.00	236285	221862	81,246	94,651	62,855	53,200	13,362	25,191	522,663	514,211	404,135
Acres Total	9797.34	10960.89	4388.04	5896.89	5446.57	5120.51	1874.13	2187.33	1455.16	1236.72	324.76	593.87	11975.04	11789.19	9260.67
Acres within ROW	1470.08	1645.90	656.78	882.59	814.14	764.58	149.21	173.92	216.67	183.55	46.42	87.09	1799.39	1770.34	1391.22
Number of poles required	427	478	191	256.22	236	222	81	95	63	53	13	25	523	514	404
Following Infrastructure															
Length following Transmission Line	29.50	10.88	15.06	1.64	14.44	9.24	0.51	5.79	0.00	0.77	2.54	0.00	17.51	14.26	5.76
Length Following Roads	30.03	5.57	26.72	3.45	3.31	2.12	13.25	8.05	1.83	0.51	0.00	4.63	15.89	35.43	6.32
Length Following Railroads	0.00	2.15	0.00	2.15	0.00	0.00	1.26	3.87	0.00	0.00	0.00	2.20	1.93	7.54	0.25
Length within Pipeline ROW	0.45	0.71	0.42	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Length	46.96	18.12	29.69	7.24	17.27	10.88	13.76	14.87	1.83	1.14	2.54	4.63	27.60	46.33	9.45
% of Length	58.08%	20.01%	82.24%	14.92%	38.59%	25.89%	89.41%	82.95%	15.37%	11.32%	100.00%	97.06%	27.88%	47.57%	12.35%
Following other Linear Corridor															
Length Following Property Lines	52.17	51.56	29.08	37.55	23.09	14.01	15.12	13.78	8.79	3.61	0.16	3.27	67.98	67.40	50.46
Length Following no Linear Feature	9.88	25.71	0.88	7.20	8.99	18.51	0.00	1.69	2.75	5.18	0.00	0.14	23.22	19.61	22.38
Government Boundaries (PLSS, County lines)	5.35	16.79	3.24	14.81	2.11	1.98	8.98	3.07	0.00	0.93	0.00	1.25	21.67	18.04	11.54
Total Linear Corridor															
Total Length Following Linear Features	70.98	64.83	35.22	41.32	35.76	23.51	15.39	16.24	9.15	4.90	2.54	4.63	75.77	77.78	54.16
% Length	87.78%	71.60%	97.56%	85.16%	79.91%	55.95%	100.00%	90.59%	76.86%	48.64%	100.00%	97.06%	76.54%	79.87%	70.76%
Land Cover Type (acres within 500 feet)															
Cropland	6139.58	8025.03	2764.82	5097.54	3396.89	2976.44	1744.36	1744.36	839.44	683.14	97.86	275.72	6985.58	6107.19	6068.43
Grassland	2079.30	1744.92	889.23	681.60	1205.22	1067.15	416.95	447.85	441.90	321.23	106.16	177.66	2470.77	2741.38	1926.36
Shrubland															
Lowland Shrub	86.56	78.75	19.89	20.12	66.67	58.63	6.18	7.14	6.94	0.00	55.15	5.53	34.81	71.42	18.85
Upland Shrub	23.98	23.42	6.19	0.00	17.80	23.42	0.00	0.00	0.47	3.03	3.41	1.10	80.36	81.84	23.30
Forest															
Bur/White Oak	91.74	115.13	42.10	28.43	49.63	86.70	28.03	20.61	23.56	18.78	0.00	0.00	70.50	57.11	62.10
Cottonwood	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maple/Basswood	28.20	32.29	24.14	5.78	4.06	26.52	4.65	15.94	3.42	6.24	0.00	0.00	7.07	7.24	8.15
All Others	722.50	797.71	156.50	41.75	566.00	759.69	70.26	72.55	109.33	171.00	6.63	24.09	1849.86	1929.25	914.75
Aquatic															
Open Water	46.58	30.48	3.81	1.98	42.77	28.50	1.28	0.00	18.26	26.86	0.00	0.00	74.92	62.41	94.21
Marshland	86.50	66.47	32.17	8.01	54.34	58.46	3.96	4.85	0.18	0.82	51.31	44.15	49.03	62.79	27.04
Urban															
High Intensity Urban	99.97	0.00	99.98	0.00	0.00	0.00	2.45	2.45	0.00	3.77	0.00	4.07	113.59	148.87	21.64
Low Intensity Urban	112.27	0.00	108.76	0.00	3.51	0.00	3.87	3.87	0.00	0.00	0.00	1.87	49.67	135.49	51.35
Transportation	273.47	37.73	240.45	11.68	33.01	26.05	29.92	8.20	11.67	1.84	4.24	56.77	180.02	375.94	35.23
Total	**9790.65**	**10951.93**	**4388.04**	**5896.90**	**5439.91**	**5111.54**	**2311.90**	**2327.80**	**1455.16**	**1236.71**	**324.76**	**590.96**	**11966.17**	**11780.93**	**9251.41**
Land Cover Type (acres within ROW)															
Cropland	**871.48**	**1209.09**	**376.52**	**759.87**	**495.45**	**450.48**	**114.65**	**124.56**	**121.74**	**104.01**	**14.30**	**33.61**	**1034.98**	**900.50**	**908.33**
% within ROW	59.28%	73.46%	57.33%	86.10%	60.86%	58.92%	76.84%	71.62%	56.19%	56.67%	30.81%	38.59%	57.52%	50.87%	65.29%
Grassland	**356.64**	**266.06**	**157.11**	**103.23**	**199.85**	**162.83**	**25.00**	**37.81**	**68.58**	**47.54**	**15.88**	**34.04**	**374.13**	**418.09**	**288.88**
% within ROW	24.26%	16.16%	23.92%	11.70%	24.55%	21.30%	16.76%	21.74%	31.65%	25.90%	34.21%	39.09%	20.79%	23.62%	20.76%
Shrubland															
Lowland Shrub	**13.82**	**9.77**	**5.21**	**2.08**	**8.61**	**7.69**	**0.00**	**0.69**	**0.92**	**0.00**	**6.52**	**0.00**	**4.78**	**13.15**	**1.94**
% within ROW	0.94%	0.59%	0.79%	0.24%	1.06%	1.01%	0.00%	0.40%	0.43%	0.00%	14.05%	0.00%	0.27%	0.74%	0.14%
Upland Shrub	**3.73**	**4.62**	**0.42**	**0.00**	**3.31**	**4.62**	**0.00**	**0.00**	**0.00**	**0.00**	**1.28**	**0.00**	**11.35**	**11.19**	**1.92**
% within ROW	0.25%	0.28%	0.06%	0.00%	0.41%	0.60%	0.00%	0.00%	0.00%	0.00%	2.77%	0.00%	0.63%	0.63%	0.14%
Forest															
Bur/White Oak	**11.07**	**18.67**	**5.35**	**5.78**	**5.71**	**12.89**	**1.37**	**1.32**	**2.20**	**1.14**	**0.00**	**0.00**	**8.98**	**5.35**	**8.30**
% within ROW	0.75%	1.13%	0.81%	0.65%	0.70%	1.69%	0.92%	0.76%	1.01%	0.62%	0.00%	0.00%	0.50%	0.30%	0.60%
Cottonwood	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
% within ROW	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Maple/Basswood	**3.57**	**4.09**	**3.45**	**0.34**	**0.12**	**3.75**	**0.00**	**1.00**	**0.09**	**0.00**	**0.00**	**0.00**	**0.49**	**0.19**	**0.42**
% within ROW	0.24%	0.25%	0.52%	0.04%	0.01%	0.49%	0.00%	0.58%	0.04%	0.00%	0.00%	0.00%	0.03%	0.01%	0.03%
All Others	**97.49**	**109.76**	**15.93**	**6.20**	**81.56**	**103.56**	**2.47**	**5.15**	**19.44**	**28.24**	**0.09**	**3.00**	**290.61**	**305.81**	**146.60**
% within ROW	6.63%	6.67%	2.42%	0.70%	10.02%	13.54%	1.66%	2.96%	8.97%	15.39%	0.19%	3.44%	16.15%	17.27%	10.54%
Aquatic															
Open Water	**6.40**	**4.48**	**0.69**	**0.41**	**6.00**	**4.06**	**0.00**	**0.00**	**2.78**	**2.28**	**0.00**	**0.00**	**9.70**	**9.70**	**12.87**
% within ROW	0.44%	0.27%	0.10%	0.05%	0.74%	0.53%	0.00%	0.00%	1.28%	1.24%	0.00%	0.00%	0.54%	0.55%	0.93%
Marshland	**18.27**	**11.50**	**9.22**	**1.53**	**9.06**	**9.97**	**0.25**	**0.00**	**0.00**	**0.00**	**8.26**	**3.86**	**2.95**	**7.91**	**2.32**
% within ROW	1.24%	0.70%	1.40%	0.17%	1.11%	1.30%	0.17%	0.00%	0.00%	0.00%	17.79%	4.43%	0.16%	0.45%	0.17%
Urban															
High Intensity Urban	**21.41**	**0.00**	**21.40**	**0.00**	**0.00**	**0.00**	**0.27**	**0.27**	**0.00**	**0.01**	**0.00**	**0.47**	**25.98**	**30.96**	**3.26**
% within ROW	1.46%	0.00%	3.26%	0.00%	0.00%	0.00%	0.18%	0.16%	0.00%	0.00%	0.00%	0.54%	1.44%	1.75%	0.23%
Low Intensity Urban	**11.44**	**0.00**	**11.44**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**7.19**	**19.66**	**10.75**
% within ROW	0.78%	0.00%	1.74%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.40%	1.11%	0.77%
Transportation	**54.44**	**7.18**	**50.03**	**3.15**	**4.40**	**4.03**	**5.20**	**3.10**	**1.19**	**0.34**	**0.07**	**11.23**	**26.77**	**45.62**	**4.96**
% within ROW	3.70%	0.44%	7.62%	0.36%	0.54%	0.53%	3.48%	1.78%	0.55%	0.18%	0.16%	12.89%	1.49%	2.58%	0.36%
Total	**1469.77**	**1645.22**	**656.76**	**882.59**	**814.07**	**763.89**	**149.22**	**173.90**	**216.93**	**183.55**	**46.41**	**86.21**	**1797.91**	**1768.13**	**1390.56**
% within ROW	99.98%	99.96%	100.00%	100.00%	99.99%	99.91%	100.00%	99.99%	100.12%	100.00%	99.98%	98.99%	99.92%	99.87%	99.95%

Assumptions:
1.Unless otherwise specified, calculations were determined based on a 1000’ route width centered around an estimated route centerline.
2. The Applicants are requesting a 150’ ROW; 75’ on either side of the pole.

Appendix H - Route Data Matrix

	Hampton to Mississippi River		Hampton to North Rochester		North Rochester - Mississippi River		North Rochester to Northern Hills 161 kV		Zumbro Dam Crossing		McCarthy Lake Route Option		La Crescent and Winona Crossings		
	End-To-End Preferred Route	*End-To-End Alternativre Route*	*Preferred Route*	*Alternative Route*	*Preferred Route*	*Alternative Route*	*Preferred Route*	*Alternative Route*	*Zumbro Dam Preferred*	*Zumbro Dam Route Option*	*McCarthy Lake Preferred*	*McCarthy Lake Route Option*	*La Crescent crossing via Property Lines*	*La Crescent crossing via I-90*	*Winona Crossing*
Residences															
0-75 feet	0	0	0	0.00	0	0	0	0	0	0	0	0	1	2	1
75-150 feet	10	2	8	2.00	2	0	14	5	0	0	0	1	5	8	4
151-300 feet	27	15	21	10.00	6	5	40	28	2	5	1	3	30	32	20
300-500 feet	94	23	75	11.00	19	12	45	36	8	4	0	4	98	107	45
Total residences (0-500 feet)	131	40	140	23.00	27	17	99	69	10	9	1	8	134	149	70
Other Structures within 75 Feet	0	0	0	0.00			0	0	0	0	0	0	0	0	0
Density (homes/mile)	1.62	0.44	3.88	0.47	1.28	0.89	6.43	3.85	0.84	0.89	0.39	1.68	1.35	1.53	0.91
Recreation															
Wildlife Management Areas															
Length Crossed	0.91	0.91	0.00	0.00	0.91	0.91	0.00	0.00	0.00	0.00	0.91	0.25	0.00	0.00	0.00
Acres within 500 feet	127.97	127.97	0.00	0.00	127.97	127.97	0.00	0.00	0.00	0.00	127.97	62.21	0.00	0.00	0.00
Number of WMAs Crossed within 500 feet	1	1	0	0.00	1	1	0	0	0	0	1	1	0	0	0
Number of WMAs Crossed within 1 mile	2	3	1	2.00	1	1	0	0	0	1	1	1	2	2	2
Scientific and Natural Areas															
Length Crossed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acres within 500 feet	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of SNAs Crossed within 500 feet	0	0	0	0.00	0	0	0	0	0	0	0	0	0	0	0
Number of SNAs Crossed within 1 mile	0	0	0	0.00	0	0	0	0	0	0	0	0	0	0	0
Snowmobile Trails															
Number Crossed	4	5	2	3.00	4	4	4	3	1	1	0	0	8	8	6
Adjacency	3.08	3.676	0.44	3.11	2.63	0.57	2.148	3.98	0.82	0.413	0	0	7.526	4.25	2.85
Minnesota State Parks															
Length crossed	0	0	0.00	0.00	0.00	0.00	0	0	0.00	0	0	0	0	0	0
Acres within 500 feet	0	0	0.00	0.00	0.00	0.00	0	0	0.00	0	0	0	0	0	0
County Parks															
Length Crossed	0	0.135	0.00	0.14	0	0	0	0	0	0	0	0	0	0	0
Acres within 500 feet	0	8.916	0.00	8.92	0	0	0	0	0	0	0	0	0	42.2	0
Number of Scenic Byway Crossings	1	1	0	0.00	1	1	0	0	0	0	0	0	0	2	0
RJD State Forest - MN DNR-owned															
Length crossed	2.145	2.393	0.00	0.00	2.15	2.39	0	0	0.00	0	1.89	0.014	0	0	0
Acres within 500 feet	281.24	311.306	0.00	0.00	281.24	311.30	0	0	0.00	0	11.62	10.73	0	0	0
RJD State Forest - Private															
Length crossed	6.29	27.63	0.00	0.00	6.29	27.63	0	0	0.00	27.63	0	0	15.79	18.94	5.197
Acres within 500 feet	683.70	3326.2	0.00	0.00	683.70	3345.46	0	0	0.00	771.951	0.31	22.39	2045.74	2407.45	628
Transportation															
Roadways															
Length paralleling Interstate Highways	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.30	22.13	0.00
Length paralleling US Highways	28.19	0.43	27.19	0.43	1.00	0.00	1.34	0.00	0.00	0.00	0.00	1.31	1.37	4.02	1.00
Length paralleling State Highways	0.00	0.86	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.76	1.76	0.00
Length paralleling county roads	6.22	3.78	3.90	1.45	2.32	2.33	10.64	6.55	1.85	0.60	0.00	4.35	11.65	11.11	5.29
Length paralleling local roads	0.30	0.84	0.30	0.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.12	1.12	0.13
Utilities															
Communication Towers within 500 feet	22	5	20	1.00	2	4	0	0	1	1	1	1	10	10	8
Agriculture															
Number of Organic Farms within 500 feet	0	0	0	0.00	0	0	0	0	0	0	0	0	0	0	0
FPPA Categories															
All areas of prime farmland within 500 feet	4966.38	6306.67	2742.96	4582.63	2248.71	1754.55	1252.46	1170.41	702.04	415.11	50.48	170.95	5300.03	5354.37	4827.45
All areas of prime farmland within ROW	759.03	924.46	422.99	684.21	336.50	241.07	100.76	130.91	101.81	56.63	7.14	25.90	811.42	818.32	737.26
% of ROW within All areas of prime farmland	**51.63%**	**56.17%**	**64.40%**	**77.52%**	**41.33%**	**31.53%**	**67.53%**	**75.27%**	**46.99%**	**30.85%**	**15.38%**	**29.74%**	**45.09%**	**46.22%**	**52.99%**
Prime farmland within 500 feet	4487.20	5462.40	2369.93	3763.78	2139.91	1728.77	1147.90	1082.60	651.74	399.17	50.48	170.95	4902.23	4927.26	4447.67
Prime Farmland within ROW	677.02	792.79	360.43	554.80	317.02	238.82	95.63	117.63	91.88	54.54	7.14	25.90	749.96	750.86	678.38
% of ROW within Prime Farmland	**46.05%**	**48.17%**	**54.88%**	**62.86%**	**38.94%**	**31.24%**	**64.09%**	**67.63%**	**42.41%**	**29.71%**	**15.38%**	**29.74%**	**41.68%**	**42.41%**	**48.76%**
Prime Farmland if drained within 500 feet	423.89	841.03	322.03	815.61	103.88	25.42	105.64	159.48	50.30	7.86	0.00	0.00	397.80	427.12	397.78
Prime Farmland if Drained within ROW	70.35	131.40	53.16	141.54	17.23	2.25	5.12	11.79	9.93	1.45	0.00	0.00	61.47	67.47	58.87
% of ROW within Prime Farmland if Drained	**4.79%**	**7.98%**	**8.09%**	**16.04%**	**2.12%**	**0.29%**	**3.43%**	**6.78%**	**4.58%**	**0.79%**	**0.00%**	**0.00%**	**3.42%**	**3.81%**	**4.23%**
Farmland of Statewide Importance within 500 feet	2191.40	2315.81	702.30	788.99	1497.66	1551.64	334.90	291.93	296.30	389.83	9.99	104.26	2482.26	2084.46	2046.85
All areas of Statewide Importance within ROW	326.20	369.28	98.92	116.18	227.59	253.52	27.19	26.56	48.68	60.91	2.16	17.04	356.39	293.41	290.41
% of ROW within Statewide Importance	**22.19%**	**22.44%**	**15.06%**	**13.16%**	**27.95%**	**33.16%**	**18.22%**	**15.27%**	**22.47%**	**33.18%**	**4.65%**	**19.57%**	**19.81%**	**16.57%**	**20.87%**
Farmland of Local Importance within 500 feet	16.89	6.58	16.90	6.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All areas of Local Importance within ROW	0.76	0.67	0.76	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% of ROW within Local Importance	**0.05%**	**0.04%**	**0.12%**	**0.08%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**
Agricultural Easements															
CRP Program Easements	107	88	51	31.00	56	19	4	2	32	7	0	0	87	101	56
Irrigation Pivots															
Number Crossed	5	19	5	19.00	0	0	0	0	0	0	0	0	0	0	0
Total Agricultural Land Impacts															
Length crossed	59.71	71.54	28.57	44.24	31.13	6.74	13.18	16.14	8.37	6.40	0.51	2.37	65.37	62.45	57.07
Acres within 500 feet	7204.89	8695.57	3444.10	5409.45	3794.62	847.61	1606.30	1909.35	1028.66	816.29	60.46	275.22	7922.00	7591.10	6936.37
Land-Based Economics															
Length Crossing Forestry Stand Areas	2.813	3.058	0	0.00	2.81	3.06	0	0	0	0	0.963	0.7855	0	0	0
Acres of Forestry Stand Impact within 500 feet	353.265	379.062	0	0.00	353.26	379.06	0	0	0	0	137.887	78.068	0	0.8	0
Acres of Forestry StandImpact within 75 feet	51.36	55.837	0	0.00	51.36	55.83	0	0	0	0	18.07	14.48	0	0	0
Number of mines within 500 feet	2	2	2	1.00	0	1	0	1	0	0	0	0	1	2	1
Length crossing Potential Aggregate Mining Areas	0	0	0	0.00	0	0	0	0	0	0	0	0	0	0	0
Acres of Potential Aggregate Mining Areas within 500 feet	0	0	0	0.00	0	0	0	0	0	0	0	0	0	0	0
Number of Karst Formations in Corridor	19	4	8	0.00	11	4	0	0	2	1	0	0	52	50	31

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2. The Applicants are requesting a 150’ ROW; 75’ on either side of the pole.

Appendix H - Route Data Matrix

	Hampton to Mississippi River		Hampton to North Rochester		North Rochester - Mississippi River		North Rochester to Northern Hills 161 kV		Zumbro Dam Crossing		McCarthy Lake Route Option		La Crescent and Winona Crossings		
	End-To-End Preferred Route	*End-To-End Alternativre Route*	*Preferred Route*	*Alternative Route*	*Preferred Route*	*Alternative Route*	*Preferred Route*	*Alternative Route*	*Zumbro Dam Preferred*	*Zumbro Dam Route Option*	*McCarthy Lake Preferred*	*McCarthy Lake Route Option*	*La Crescent crossing via Property Lines*	*La Crescent crossing via I-90*	*Winona Crossing*
Water Resources															
Stream Crossings (number crossed by centerline)															
Streams	99	113	31	46.00	68	67	18	18	15	13	5	2	113	97	103
Ditches	1	1	0	0.00	1	1	0	0	0	0	1	0	0	0	0
Other Linear water systems	5	2	1	0.00	4	1	0	0	1	0	0	0	3	2	6
Total	105	116	32	46.00	73	69	18	18	16	13	6	2	116	99	109
PWI Streams within 1mile	60	76	24	35.00	38	46	10	20	12	9	10	11	84	82	50
PWI Streams within 500 feet	42	50	21	16.00	21	34	9	9	4	4	2	2	44	41	37
PWI Streams within ROW	31	36	17	13.00	14	23	3	6	1	2	2	1	35	25	29
PWI streams crossed	25	31	12	9.00	13	22	2	6	1	2	1	1	21	17	17
PWI Lakes within 1mile	16	16	2	4.00	14	12	1	0	2	1	5	3	8	8	3
PWI Lakes within 500 feet	5	3	1	0.00	4	3	0	0	1	1	0	0	8	8	3
PWI Lakes within ROW	3	1	1	0.00	2	1	0	0	1	1	0	0	6	6	3
PWI Lakes crossed	3	1	1	0.00	1	1	0	0	1	0	0	0	6	6	3
Shallow Lakes within 1 mile	169	198	45	44.00	130	167	20	21	28	32	40	45	303	322	167
Shallow lakes within 500 feet	6	2	3	0.00	3	2	0	0	1	2	0	0	13	12	3
Shallow lakes within ROW	2	3	0	1.00	3	2	0	0	0	2	0	0	7	5	8
Shallow lakes crossed	1	0	0	0.00	2	0	0	0	0	2	0	0	6	3	7
Wetlands Forested (NLCD Class)															
Number crossed	16	15	3	3.00	13	12	5	7	1	0	9	3	5	5	3
Length crossed	1.08	1.018	0.27	0.24	0.81	0.78	0.094	0.406	0.07	0	0.36	0.24	0.36	0.36	0.135
Acres within 500 feet	135.62	157.59	18.87	35.58	116.75	122.00	44.02	48.439	1.11	157.59	67.544	21.48	60.74	59.407	33.116
Wetlands PWI															
Number crossed	3	1	1	1.00	2	1	0	0	1	0	0	0	4	4	3
Length crossed	0.3	0.13	0.02	0.02	0.28	0.13	0	0	0.16	0	0	0	0.749	0.75	0.53
Acres within 500 feet	36.85	16.906	2.94	4.28	33.91	16.91	0	0	17.00	13.99	0	0	136.55	136.55	63.5
Wetlands NWI															
Number crossed	18	19	13	13.00	7	7	2	5	1	4	3	2	17	16	16
Length crossed	2.54	2.835	0.55	0.84	1.98	1.99	0.139	0.282	0.16	0.218	1.4	0.39	1.75	1.69	1.53
Acres within 500 feet	305.04	367.02	51.23	109.19	253.81	257.82	36.536	48.81	19.98	36.606	154.9	68.56	263.6	275.47	214.29
Wetland Totals															
Number crossed	21	20	15	14.00	8	7	6	9	3	4	3	3	3	17	17
Length crossed	3.13	3.262	0.82	1.01	2.31	2.24	0.234	0.548	0.23	0.218	1.46	0.639	1.46	1.81	1.633
Acres within 500 feet	344.16	412.391	68.91	133.39	275.25	278.99	61.887	71.016	21.10	36.611	170.205	78.56	170.205	294.54	232.17
Acres of PWI Wetlands impacted within ROW	5.99	2.393	0.42	0.00	5.22	2.39	0	0.00	2.84	0.1307	0	0	15.77	15.77	10.53
Acres of NWI Wetlands impacted within ROW	46.01	53.368	8.98	16.01	37.03	37.35	1.51	2.68	2.84	3.663	25.01	8.67	32.19	23.12	30.55
Acres of Forested Wetlands Impacted within ROW	18.77	19.498	3.71	4.59	15.06	14.33	1	3.78	0.90	0	6.9	5.04	7.6	6.8	3.35
Acres of Total Wetlands impacted within ROW	54.41	60.52	12.62	19.26	41.78	41.26	2.51	5.17	3.78	3.66	26.55	12.92	35.06	34.19	32.67
Floodplains															
Length crossed	6.02	5.16	2.07	1.04	3.92	4.12	0.47	1.51	0.16	0.19	2.50	2.11	3.19	2.33	2.82
Acres wtihin 500 feet	708.87	647.96	224.65	140.41	484.22	507.54	79.13	183.86	20.41	54.65	312.52	283.98	490.12	425.55	336.28
Flora															
MCBS Biodiversity significance															
Number of MCBS sites within 1 mile	36	39	21	22.00	15	21	4	16	5	4	5	4	31	34	15
Number of MCBS sites crossed	5	9	1	3	4	6	0	2	1	1	1	1	11	32	4
Total length of MCBS sites crossed															
Outstanding	0.46	0.74	0.00	0.28	0.46	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High	1.36	0.91	0.50	0.05	0.86	0.86	0.00	0.72	0.00	0.59	0.86	0.08	2.80	2.80	0.22
Moderate	1.22	0.86	0.00	0.08	1.21	0.79	0.00	0.00	0.89	0.00	0.00	0.00	4.52	5.05	1.54
Fauna															
USFWS Refuge															
Length crossed	0.52	0.52	0.00	0.00	0.52	0.52	0.00	0.00	0.00	0.00	0.00	0.00	4.12	4.11	0.00
Acres within 500 feet	64.64	64.64	0.00	0.00	64.64	64.64	0.00	0.00	0.00	0.00	0.00	0.00	47.85	47.85	0.00
Trout Streams (Number Crossed)															
Specially Regulated	0	0	0	0.00	0	0	0	0	0	0	0	0	1	0	1
Winter Regulated	0	0	0	0.00	0	0	0	0	0	0	0	0	0	0	0
Designated	3	3	1	0.00	2	3	0	0	0	0	0	0	7	6	5
Important Bird Areas															
Number within 1 mile	3	3	1	1.00	2	2	0	0	0	0	2	2	1	1	1
Number crossed	2	2	0	0.00	2	2	0	0	0	0	1	1	1	1	0
Length Crossed	1.93	1.931	0.00	0.00	1.93	1.93	0	0	0.00	0	1.414	0.148	4.113	0.04	0
Acres within 500 feet	235.66	235.66	0.00	0.00	235.66	235.66	0	0	0.00	0	171.016	60.63	47.613	47.61	0
Grassland Bird Conservation Areas															
Number within 1 mile	2	3	2	3.00	0	0	1	2	0	0	0	0	0	0	0
Number crossed	1	1	1	1.00	0	0	0	1	0	0	0	0	0	0	0
Length Crossed	1.12	3.855	1.12	3.86	0	0	0	2.598	0	0	0	0	0	0	0
Acres within 500 feet	88.07	482.038	88.07	482.04	0	0	0	314.76	0	0	0	0	0	0	0

Assumptions:

1.Unless otherwise specified, calculations were determined based on a 1000’ route width centered around an estimated route centerline.

2. The Applicants are requesting a 150’ ROW; 75’ on either side of the pole.

Appendix H - Route Data Matrix

	Hampton to Mississippi River		Hampton to North Rochester		North Rochester - Mississippi River		North Rochester to Northern Hills 161 kV		Zumbro Dam Crossing		McCarthy Lake Route Option		La Crescent and Winona Crossings		
	End-To-End Preferred Route	*End-To-End Alternative Route*	*Preferred Route*	*Alternative Route*	*Preferred Route*	*Alternative Route*	*Preferred Route*	*Alternative Route*	*Zumbro Dam Preferred*	*Zumbro Dam Route Option*	*McCarthy Lake Preferred*	*McCarthy Lake Route Option*	*La Crescent crossing via Property Lines*	*La Crescent crossing via I-90*	*Winona Crossing*
Rare and Unique Natural Resources															
Federal															
Number of threatened species occurrences recorded within 1 mile of route	0	13	0	13.00	0	0	0	0	0	0	0	0	0	0	0
Number of endangered species occurrences recorded within 1 mile of route	12	1	12	1.00	0	0	0	0	0	0	0	0	0	0	0
Number of candidate species occurrences recorded within 1 mile of route	0	0	0	0.00	0	0	0	0	0	0	0	0	0	0	0
Number of special concern species occurrences recorded within 1 mile of route	0	0	0	0.00	0	0	0	0	0	0	0	0	0	0	0
State															
Number of threatened species occurrences recorded within 1 mile of route	26	86	12	65.00	16	21	6	8	4	3	5	8	16	21	15
Number of endangered species occurrences recorded within 1 mile of route	13	2	12	1.00	1	1	0	0	0	0	1	1	1	1	1
Number of candidate species occurrences recorded within 1 mile of route	27	42	3	11.00	23	31	3	2	0	1	12	9	24	26	4
Number of special concern species occurrences recorded within 1 mile of route	30	62	10	19.00	20	43	2	5	1	5	2	2	29	34	16
DNR rare native communities within 1 mile	1897	3233	154	515.00	1744	2724	35	70	21	109	546	301	5460	5614	328
DNR RR ROW Prairies within 1 mile	0	2	0	2.00	0	0	0	0	0	0	0	0	1	4	1
Permanent Land Conservation Programs															
Other Easements (within 1 mile)															
CRP Program Easements	601	562	263	206.00	383	401	88	85	120	101	6	6	575	607	419
CREP	2	1	2	1.00	0	0	0	0	0	1	0	0	10	7	4
CREP Wetland Restoration	0	0	0	0.00	0	0	0	0	0	0	0	0	0	0	0
BWSR Wetland Bank Easements	0	0	0	0.00	0	0	0	0	0	0	0	0	1	1	1
RIM Wetland Restoration	0	0	0	0.00	0	0	0	0	0	0	0	0	0	0	0
Land Ownership (acres within 1000' corridor)															
Federal	66.13	66.13	0.00	0.00	66.13	66.13	0.00	0.00	0.00	0.00	0.00	0.00	56.59	56.59	56.59
State	404.90	434.97	0.00	0.00	404.90	434.96	0.00	0.00	0.00	0.00	135.28	69.94	0.00	0.00	0.00
County	0.00	8.92	0.00	8.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	42.19	0.00
Village, City, or Town	309.83	239.10	309.83	239.10	0.00	0.00	95.52	264.57	0.00	0.00	0.00	0.00	310.48	241.88	185.72
Private	9016.48	10211.78	4078.21	5648.88	4975.54	4619.42	1778.61	1922.76	1455.16	1236.72	189.48	523.93	11607.97	11448.53	9018.36
Tribal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Assumptions:
1.Unless otherwise specified, calculations were determined based on a 1000’ route width centered around an estimated route centerline.
2. The Applicants are requesting a 150’ ROW; 75’ on either side of the pole.

Appendix I:
Information Related to Preferred, Alternative, and Considered but Eliminated Segments

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Considered but Eliminated Segments

Summary

The route identification process for the CapX2020 Hampton – Rochester – La Crosse 345 kV Transmission Line Project (Project) was conducted over 24 months between summer 2007 and summer 2009. The following text describes how potential route segments were identified, compared, and eliminated or selected for inclusion in a final Preferred or Alternative Route as part of the Route Permit Application (Application). An index map for the route sections described in the chapters that follow is located in Appendix J, Figure J-1. All segments associated with the Preferred and Alternative Routes as well as those considered but eliminated are shown on Figures J-2, J-3, J-4, and J-5 in Appendix J.

Table 1-1 describes routing concepts and terminology used for the purposes of this report.

Table 1-1: Routing Terminology

Routing Term	Description/Definition
Route Segments	Discrete segments where the transmission line may be routed, located primarily along existing linear infrastructure or property lines. Segments are named with letter/number combinations depending on their geographical location. Segment combinations of multiple, connecting segments are noted in the text as A1-A2-A3-A4, etc.
Route Section	Discrete midpoints or endpoints that contain multiple potential routes. Combinations of route segments can be compared within a single route section to identify a Preferred and Alternative Route within that route section. Preferred and alternative routes within multiple route sections can be combined to perform an end-to-end analysis of a route to and from project endpoints.
Preferred/Alternative Route	Routes that are being proposed for the Project in the Minnesota Route Permit Application.

1.0 Hampton-North Rochester 345 kV Section

1.1 Hampton Substation Area

The Hampton Substation is the northern endpoint for the Hampton-North Rochester 345 kV section. The Hampton Substation was proposed as part of the Brookings County to Hampton 345 kV Project (Brookings Project), and serves as the northeastern endpoint for that project. The exact location where the Preferred and Alternative Routes would exit the Hampton Substation will depend on the final site selected for the Hampton Substation.

The Applicant's Preferred Route was identified as A3-A5 along the east side of US Highway 52 (US 52) to the intersection of US 52 and Minnesota Highway (MN) 56. These route segments were chosen as preferred because they are located along an existing major transportation corridor. A5 deviates slightly from US 52 to avoid a cluster of commercial buildings located next to the roadway, and at the US 52/MN-56 interchange to allow for coordination of structure placement with the Minnesota Department of Transportation (Mn/DOT). A10 is located on the west side of US 52 for approximately 0.7 miles to avoid farms and residences located on the east side of the road. The Preferred Route overlaps with the Brookings Project's Alternative Route. The Preferred Route is shown on Figure J-2 in Appendix J.

Alternative Route segments for the Project were identified approximately 1.0 mile east of US 52. These segments are located on the opposite side of US 52 from the Brookings Project's routes to provide sufficient distance between the two transmission lines should the route permit be issued for the Brookings Project's Alternative Route. The route segment combination A194-A193-A151-A150-A122-A6-A8 was chosen as the Alternative Route exiting the Hampton Substation. This route combination follows mostly parcel lines and field lines, and avoids interruption of agricultural operations wherever possible. Slight angles were added along segment A6 along 240th Street E and just south of Lewiston Blvd. to increase distance from a residences located along these roads. Segment combination A176-A177 was identified as part of the Alternative Route to allow access to either the US 52 or MN-56 corridors from the Alternative Route from the Hampton Substation. A177-A176 follows a property line for most of its length. The Alternative Route is shown on Figure J-2 in Appendix J.

Segments in this area that were considered but eliminated are shown on Figure J-2 in Appendix J. Segment A2 was originally identified because it followed a field line, but was eliminated due to proximity to residences. Segment A4 was eliminated to avoid significant overlap between the Preferred and Alternative Routes, and the Brookings Project Alternative Route. Segments A121, A7, and A123 were eliminated because the segments result in a longer route that follows a lower percentage of parcel lines and would necessitate more corner structures than the segment combination A122-A6-A8. Segments A173 and A153- A154 were eliminated because they would follow parcel lines for a shorter distance and necessitate more corner structures than A177-A176. Segment A168 was considered but eliminated due to proximity to residences. Segments A11, A12, A13, and A175, located on the west side of US 52, were eliminated because the Preferred Route follows US 52, and the Alternative Route connected with the MN-56 corridor south of the A11/A12/A13 area. Additionally, route segments chosen for the Alternative Route

are located on the east of US 52 so as to allow for a sufficient distance between the Hampton – Rochester – La Crosse Project and the Brookings Project.

1.2 US 52 Corridor – Preferred Route

An alignment that would parallel US 52 was chosen as the Preferred Route in the Hampton-North Rochester 345 kV section for several reasons. US 52 offers the most direct route between the Hampton and North Rochester Substation siting areas, and serves as a major transportation corridor in southeast Minnesota. Furthermore, an existing 69 kV transmission line owned by Xcel Energy parallels the road between Cannon Falls and Zumbrota. The Preferred Route along US 52 would follow the existing 69 kV transmission line for approximately 16 miles. Utilizing existing transmission and transmission corridors is a high priority in Minnesota's non-proliferation siting priorities. Segments that comprise the Preferred Route in this area are A155-A17-A19-A192-A39-A119-A40-A134-A135-A9-A77.

Route segments that would deviate from US 52 and the existing 69 kV transmission line were eliminated in favor of utilizing existing linear corridors. At the Cannon River crossing, this strategy is consistent with Minnesota Department of Natural Resources (MDNR) recommendations that "any crossing of the Cannon River utilize an existing corridor, with the preferred locations adjacent to Highway 56 or Highway 52" (MN DNR 2009). Segments A18 and A20 were eliminated because they did not follow existing linear corridor across the Cannon River.

The Applicant identified a preferred substation siting area in the southern portion of the North Rochester Substation siting area. A Preferred Route was identified west of US 52 that would avoid more densely populated areas of Zumbrota, including US 52 where residences occur on both sides of the highway. The Applicant identified several route options west of Zumbrota between US 52 and the preferred siting area within the North Rochester Substation siting area. The route segment combination A41-A138-A139-A43-A143-A106-A95-A97-A184 was identified as the preferred segment combination because it would follow parcel lines for the majority of its length, follow an existing transmission line for 2.5 miles and there would be no residences within 150 feet of the centerline. Only segment A43 would deviate from parcel lines, to increase the distance between the preferred alignment and a home and farm buildings.

Figure J-2 in Appendix J shows routes segments in this area that were considered but eliminated. Segments A124, A80, A69, and A101 were eliminated because they would likely increase the overlap between the Preferred and Alternative Routes approaching the North Rochester Substation siting area, and because other routing opportunities existed to the east that followed property lines. Other route segments were considered but eliminated because they were located in proximity to more residences (A124, A79, A81, A78, A82, A140, A86, A89 A91, A98, A84, A85, and A182), or appeared to have the potential to interrupt agricultural operations (A83-A89-A92, A137-A90, A141, A142, A144).

1.3 MN-56 / MN-60 Corridor – Alternative Route

MN-56 between Cannon Falls and Kenyon, and MN-60 between Kenyon and Zumbrota, are major transportation corridors that together connect the proposed Hampton Substation siting area with the proposed North Rochester Substation siting area. In accordance with Minnesota rules and policy that require consideration of existing transportation corridors in the routing of new high-voltage transmission lines, the MN-56 and MN-60 corridors were included in the Project Certificate of Need (CON) notice corridors, and the preliminary macro-corridors as an alternative to the Preferred Route that parallels US 52 for the majority of its length.

Route segments along these corridors are discussed in three sections; Intersection of US 52/MN-56 to the Cannon River, Cannon River to Kenyon, and Kenyon to the North Rochester Substation siting area. Figure J-2. Appendix J shows all segments along the MN-56 corridor, and Figure J-2, Appendix J shows all segments along the MN-60 corridor.

1.3.1 Intersection of US 52/MN-56 to the Cannon River

Segment combination A14-A157-A159 was identified as the Alternative Route in this area. Segment A14, which follows a railroad corridor and parcel lines, was selected because it had no residences located within 150 feet of the route centerline but still followed an existing linear feature. Plans exist for an industrial park along the abandoned railroad grade where segment A14 is proposed. Industrial land uses are generally considered more compatible with transmission line routing when compared to residential land use, and transmission line easements are often incorporated into building setbacks and parking areas.

Segment combination A157-A159 was identified and added for consideration in early 2009 to provide an alternative that did not cross Lake Byllesby Regional Park. Segment A159 would follow parcel lines along the Dakota/Goodhue county boundary. The segment combination borders, but does not cross, the western boundary of Lake Byllesby Regional Park, away from potential developments identified in the Master Plan. The segment combination would minimize impacts to residences and would cross the Cannon River at a narrow point such that the river can be spanned

Segments that were considered but eliminated in this area are shown on Figure J-2 in Appendix J. Segment A16 would parallel MN-56, but was eliminated because there are three residences located within 150-feet of the route centerline. Three alternative segment combinations were identified to cross the Cannon River. Segment combination A23-A25 would follow MN-56, segment combination A156-A21-A23-A24 would follow Dixie Avenue to the Cannon River and would follow an abandoned railroad grade on the south side of the river, and A158-A22 would not follow existing linear features. All three options would cross Lake Byllesby Regional Park, managed by Dakota County. Segment A25 would also pass near a parcel of Byllesby County Park, managed by Goodhue County. In a letter to the Applicant dated January 9, 2009, MDNR recommended that “any crossing of the Cannon River utilize an existing corridor, with the preferred locations adjacent to MN-56 or US 52.” Although Segment A25 does follow along the east side of MN-56, it crosses approximately 0.5 miles of West Byllesby Park. The Lake Byllesby

Regional Park Master Plan (Dakota County 2005) identifies this area as a bird viewing hub, with potential for developments such as bird blinds, informational kiosks, parking, picnic shelter, a residential learning center, and a boardwalk. Although construction of the proposed transmission line and associated 150-foot right-of-way (ROW) clearing on the east side of the highway in this area would not impede these developments, the Applicant identified another Cannon River crossing that would not cross Byllesby Park. Another factor in not proposing the MN-56 river crossing is the route segments south of the river (A22-A26-A103) have more residences in close proximity, do not follow property boundaries as well and fall within an area of concern for the Stanton airfield.

1.3.2 Cannon River to Kenyon

The Applicant assessed several roads, including MN-56 and country roads, between the Cannon River and Kenyon for routing feasibility consistent with the approach used for US 52. In this area, however, residences are more prevalent and are located close to roads. In the judgment of the Applicant, mid-section property boundaries (or parcel lines) are more appropriate transmission line routes in this area. This approach maximizes the distance from homes, a consistent message heard in public comments.

The Applicant assessed property boundaries in this corridor for routing opportunities and identified three long route segments (A46, A47, and A48) along the MN-56 corridor that would maximize the use of parcel lines or field/fence lines and minimize impact to residences. These options also avoided natural resources in this area, which includes a large wetlands complex associated with the Warsaw WMA. Segment A46 is located 0.25 miles west of MN-56 and would follow property lines for approximately 67 percent of its total length (9.29 miles). A46 also passes 0.25 mile west of the westernmost boundary of the Nansen Agricultural Historic District, which is listed on the National Register of Historic Places (NRHP) as a historic district.

Segment A47 would parallel MN-56 for approximately 0.5 mile and would follow property boundaries for approximately 70 percent of its total length (9.49 miles). Segment A47 also borders the Warsaw Wildlife Management Area (WMA) and passes through wetlands adjacent to the Warsaw WMA which are greater than 1000 feet in width and would not be spannable by the proposed transmission line. Several residences are clustered around the Warsaw WMA and wetland areas, and it would be difficult to avoid impact to resources and residences in this area. Segment A47 also crosses the most upland forest and therefore would likely require the most tree clearing.

Segment A48 would follow property lines for approximately 89 percent of its total length (10.5 miles). A48 would follow 5th Avenue Way through the municipal boundary of Dennison approximately 0.3 miles east of residential developments. Segment A48 would be located within one mile of the Veblen Farmsted near Nerstrand, a historic farmstead which is listed on the NRHP. Segment A48 would also cross a native plant area which has been identified by MDNR as having outstanding biodiversity.

The Applicant proposed segment A48 as the alternate route because it minimizes impacts to residences and follows property boundaries for the greatest percentage compared to route segments A46 and A47. The table below provides a summary of routing factors taken into consideration.

Category	Data		
	A46	A47	A48
Corridor Sharing			
Total length paralleling roads (miles)	0.4	0.7	1.2
% paralleling roads	4%	7%	11%
Total length paralleling section lines Property Lines (miles)	6.2	6.6	9.4
% paralleling property lines	67%	70%	89%
Residences			
0-75 feet (within ROW)	0	0	0
75-150 feet	0	1	1
151-300 feet	2	2	2
Other Routing Considerations			
Length crossing upland forest (miles)	0.41	0.83	0.18
	Close proximity to Nansen Agricultural Historic District	Crosses Warsaw WMA	Crosses an area of outstanding biodiversity

1.3.3 Connecting the Cannon River Crossing with A48

A network of route segments was identified that could be used to link the segment that crosses the Cannon River (A159) with the remainder of the MN-56 corridor between the Cannon River and Kenyon (A48). Routing constraints identified in this area include Stanton Airfield, a privately-owned public-use airfield near Stanton, and farms and residences.

Segment combination A120-A161-A167 was identified as the Alternative Route in this area. This segment combination offers the most direct route between the A159 and A48. Segment A120, located west of the Stanton Airfield was initially identified as a route that avoided interfering with approaches to Stanton Airfield. A120 was carried forward because it passed by a small number of residences and followed 100 percent parcel lines. Segment combination A161- A167 was chosen to connect to A48 because the segment combination would avoid residences located on Goodhue Avenue. Segment A167 would cross an irrigation pivot at an angle that would not interrupt operation of that pivot.

Segments considered but eliminated in this area are shown on Figure J-2 in Appendix J. Segment combination A160-A126 -A103 was eliminated because it would follow only 53 percent parcel lines. Segments that connected between the eliminated Cannon River crossing segments and the eliminated segments A46 and A47, and segments that conflict with the Stanton Airfield's regulated airspace (A35), were eliminated from consideration. The Applicant also identified a network of segments that connected the MN-56 corridor with the US 52 corridor south of the Cannon River, but a feasible route was not

identified in this area due to high residential density southwest of Cannon Falls and along roadways, and lack of suitable linear corridors. These segments are all shown in Figure J-2 in Appendix J.

1.3.4 MN-60 Corridor to North Rochester Substation Siting Area

Segment A48 ends northwest of Kenyon, and connects to a network of segments along the MN-60 corridor that connect to the alternative siting area within the North Rochester Substation siting area (Figure J-2, Appendix J).

The Alternative Route in this area would follow segments A129-A130-A53-A55-A62-A66-A164-A165-A87-A179-A169-A93-A44-A45-A106-A148-A149-A186. The combination of segments A129-A130-A53-A55 was carried forward because there was only one residence within 300 feet of the centerline, and because it followed parcel lines for 87 percent of its length. Where segments A53 and A55 do not follow parcel lines, there does not appear to be potential for interruption of agricultural operations. The segment combination carried forward (A62-A66-A164-A165-A87) follows parcel lines for 91 percent of its length. Where it does not follow parcel lines, there does not appear to be potential for interruption of agricultural operations. Segment combination A179-A169 was identified as a bypass to the Woodbury WMA because it followed parcel lines and is located at least 0.5 mile from the WMA. Agricultural operations under A179 appear to be spannable using strategic structure placement along field lines. Segment combination A93-A44-A45 forms a 1.25-mile straight line to join with the segments approaching the North Rochester Substation sting Area, and follow 100 percent parcel lines.

Segments A106-A148-A149 were selected because they followed mostly property lines, and allowed a continuation of the straight line formed by A93-A44-A45 to the northern boundary of the North Rochester Substation siting area. Angles were added to A106 along a property line to maximize distance between the transmission line and a residence with farm buildings. A186 was identified because it followed the Prairie Island-Byron 345 kV transmission line into the alternative siting area within the North Rochester Substation siting area.

Segments in this area that were eliminated are shown on Figure J-2 in Appendix J. The segment combination along 457th Street (Segments A131-A49-A58-A57) and segments that connect to it (A132, A54, A56) were eliminated because there were more residences within 300 feet of the centerline than along the Alternative Route. Similarly, the segment combination A64-A68-A74-A178 was eliminated because there were more residences located within 300 feet of the centerline when compared with segment combination A62-A66-A164-A165-A87. Other connector segments close to Kenyon (A50, A59, A60, and A61) were eliminated because these segments have more residences nearby and/or do not follow property boundaries as well as route segments A129-A130-A53-A55.

Segments along MN-60 (A65, A67, A166, and A70) and connectors to MN-60 (A172, A101) were eliminated because residences were located close to that roadway. Segments A170-A73-A178 were eliminated because of proximity to residences. Segments A163-A71 were eliminated because they did not follow mostly parcel lines and appeared to have the potential to interrupt several agricultural operations. Segments leading to the preferred siting area, including A75, A76, A94, A183, and A96, were eliminated because segments farther north allow the Alternative Route to connect to either the alternative

or preferred substation siting area. Segments A104 and A171 were eliminated because they are located in close proximity or adjacent to the Woodbury WMA.

2.0 Zumbro River Crossing 345 kV Section

Figure J-3 in Appendix J shows all route segments in the Zumbro River Crossing 345 kV section.

2.1 Zumbro River Crossing

Three potential routes were identified as options for the Zumbro River Crossing; the Preferred Route White Bridge Road crossing, the Alternative Route North Zumbro crossing, and the Route Option Zumbro Dam crossing. The routes and route segments associated with each crossing are detailed in the sections that follow and are shown on Figure J-3 in Appendix J.

2.1.1 White Bridge Road Crossing – Preferred Route

The White Bridge Road crossing was chosen as the Preferred Zumbro River Crossing. The White Bridge Road route consists of the following segment combination: B180-B181-B86-B2-B192-B4-B5-B138-B104 B105-B107-B69-B102-B100-B101-B110-B94. Segment combination B180-B181-A181-B86 was identified as an egress from the preferred North Rochester Substation siting area. This segment combination would follow parcel lines for the majority of its length and would parallel US 52 for 0.5 mile. Segment B2-B192-B4-B5-B138-B104 would follow property lines for less than 50 percent of its length; however, it would avoid several homes located in proximity to property lines or roads.

Segment B105 follows a parcel boundary for the majority of its length, and segment B107 follows parcel lines and roads for its entire length. There are no residences located within 300 feet of segment combination B69-B102 this segment combination would follow property lines for over 50 percent of its length.

Segment B100, crosses the Zumbro River on the north side of White Bridge Road to avoid a small residential development on the south side of White Bridge Road. After crossing the Zumbro River, segment B100 would follow an angle northeast along the border of a forested area to avoid impacts to agriculture. Parcel lines were not followed along this angle so as to reduce impacts to forested areas along the river. The remaining length of segment B100 would follow property lines. Segments B101, B110, and B94 would follow parcel lines for 100 percent of their lengths.

Segments in this area that were eliminated are shown on Figure J-3 in Appendix J. Segment combination B13-B15-B140-B16-B108 was eliminated because it would have a significantly greater impact on residences and would require a greater number of corner structures. Segment combination B103-B81-B73-B72 and segment B24 were eliminated because they would have greater impacts on residences. Segment combination B25-B39-B41 was eliminated because it appeared to interrupt farm fields.

2.1.2 North Zumbro Crossing – Alternative Route

The North Zumbro Crossing is located approximately 2.2 miles north of the Preferred Route.

Segments combination B182-B184-B183-B175-B1-B126-B70-B95-B97-B99-B164 was identified as the North Zumbro Route. Segment combination B182-B184-B183 would follow parcel lines and 195th Avenue for the majority of its length. Segment B175 angles away from 195th Avenue to avoid several residences, and roughly follows a diagonal field line before joining segment B1 which would follow an east/west property boundary. Segment B1 follows parcel lines for 78 percent of its length up to 595th Street, which it follows for approximately 0.5 miles. Segment B126 was selected over B128 because there were no residences located within 300 feet of the centerline, whereas there were four residences located within 300 feet of the centerline along Segment B128. Segment B70 was chosen over B133 because it followed more existing parcel lines (for 87 percent of its length), would require less tree clearing, and has fewer residences within 300 feet of the centerline when compared to other segments in the area. Segment combination B95-B97-B99 was identified because it would follow parcel boundaries for a greater length when compared to the segment Combination B96-B129-B97-B98.

Segments in this area that were eliminated are shown on Figure J-3 in Appendix J. Although Segment B82 would parallel roads for the majority of its length, it was eliminated because of proximity to residences. Segment combination B185-B85-B176 was eliminated because it did not provide a feasible egress from the northern portion of the North Rochester Substation siting area. Segment combination B128-B90-B133-B129 and associated connector segments B127 and B96 were eliminated because they would follow less parcel lines, would require more tree clearing, and would have greater impacts on residences.

2.1.3 Zumbro Dam Crossing

The Zumbro Dam crossing is located at the Zumbro Hydro Electric Dam, where an existing 34.5 kV transmission line approaches the Dam from the west.

The route option for the Zumbro River Crossing would have the same alignment as the White Bridge Road crossing for the following segment combination: B180-B181-A181-B86-B2-B192-B4-B5-B138-B104. The Zumbro Dam crossing then deviates from the White Bridge Road crossing at the intersection of segments B104 and B105, and would consist of the following segments: B8-B10-B11-B12-B17-B18-B74-B21-B28-B91-B111.

Segments that comprise the Zumbro River approach and crossing are B2-B192-B4-B5-B138-B104-B8-B10-B11-B12-B17-B18. Although this segment combination only follows property lines for approximately 50 percent of its length, there are no residences within 300 feet of the centerline for this segment combination. In addition, the route follows an existing 34.5 kV distribution line for 0.8 mile of its length and would eliminate approximately 0.75 mile of tree clearing. On the east side of the Zumbro River, the segment combination B74-B21-B28-B91-B111 would be used to connect the Zumbro River crossing with the routes to Alma. This segment combination was chosen because it would follow property lines or

roads for 75 percent of its length and there are no residences located within 300 feet of the route centerline.

Segments in this area that were eliminated are shown on Figure J-3, Appendix J. Segment combination B135-B137 would parallel roads for the entirety of its length, but was eliminated because it would increase impacts to residences, as there are three residences located within 300 feet of the route centerline. The segment combination north of the Preferred Route (B3-B136-B7) would follow property lines for almost 100 percent of its length, but was eliminated because this segment combination would increase the amount of tree clearing required and would increase residential impacts. Similarly, segment B106 to the south of the Preferred Route would also require a greater amount of tree clearing and would increase residential impacts.

2.1.4 75th Street River Crossing

A Zumbro River crossing utilizing 75th Street in Olmsted County was considered early in the route analysis process. This route consists of a portion of segment B22 and segments B26, B42, B43, B118, B162, B44 and then connecting to segment B54 along the Dairyland Q3 161 kV transmission line.

B22 follows a 34.5 kV transmission line and B26-B42-B118 follow both a road (75th Street) and a 69 kV transmission line.

Although these segments follow roads and/or low voltage transmission lines, they pass very close to many homes in rural residential neighborhoods north of Rochester. This route segment also adds five miles in length when compared to the Preferred Route (White Bridge Road and the Preferred Route to Alma).

3.0 Alma Approach 345 kV Route Section

Figure J-4, Appendix J shows all route segments between the Zumbro River and the Alma crossing option.

3.1 Zumbro River to Dairyland Q-3 161 kV Line

Route segments which make up the Preferred and Alternative Routes between the Zumbro River and the Dairyland Q-3 161 kV transmission line are located in similar geographical areas and form straight lines 17-20 miles long and 1.7 miles apart from each other. The Preferred and Alternative Routes consist of the following segment combinations:

- Preferred Route: B111-B93-B161-B163-B29-B80-B32-B88-B77-B34-B36-B116-B37-B55
- Alternative Route: B27-B166-B79

The Preferred Route was chosen because it follows a greater percentage of property lines (88 percent versus 43 percent), and transmission lines and roads (3.4 percent versus 0.4 percent) than the Alternative Route. Additionally, the Preferred Route has less of an impact on forested areas than the Alternative Route.

Segments in this area that were eliminated are shown on Figure J-4 in Appendix J. Segment B92 was eliminated because it did not follow parcel lines and would require multiple corner structures. B30, B31, and B33 were eliminated because they would add approximately 2 miles in length and corner structures without offering significant benefits such as avoidance of residences or natural resources. Similarly, B76 was eliminated because it offered no significant advantages over B88, but would add length and corner structures. Segment combination B35-B177 and B115-B177 were eliminated because they would require a greater number of corner structures than B36-B116.

3.2 Dairyland Q-3 161 kV Transmission Corridor

The Preferred and Alternative Routes to the Mississippi River crossing at Alma would share the same segment (B56) for 5.5 miles through the bluffs approaching the Mississippi River. Segment B56 follows the existing Dairyland Q-3 161 kV transmission line through the bluffs, and the RJD Memorial Hardwood Forest. Segment B56 intersects the far northwest corner of the Snake Creek management unit of the RJD Memorial Hardwood Forest, which is managed for recreation purposes. Applicant concluded that any other route alignment in this area would require new right of way through the RJD Memorial Hardwood Forest to reach the Mississippi River. To avoid the creation of a new corridor, Applicant concluded that the Preferred and Alternative Routes should follow the Dairyland Q-3 161 kV transmission line.

Segment B56 exits the bluffs and the RJD State Forest in the Mississippi River Valley near MN-61. Segment B57 continues along the same alignment as the Dairyland Q-3 161 kV transmission line and crosses the McCarthy Lake WMA prior to crossing the Mississippi River south of Alma. McCarthy Lake WMA is a conservation and recreation area that provides important wildlife habitat and opportunity for hunting, birding, and wildlife viewing.

In a letter to the Applicant dated January 9, 2009, MDNR stated its opposition to a route through the McCarthy WMA. The Agency cites the restoration work by The Nature Conservancy (TNC), which owns the Weaver Dunes Scientific and Natural Area property adjacent to the southeastern side of the WMA, the National Audubon Society designation of the area as an Important Bird Area, and the restoration of a dredge soil disposal site by U.S. Army Corps of Engineers (USACE). The letter also references the MDNR-owned Kellogg-Weaver Dunes Scientific and Natural Area adjacent to the northeastern side of the WMA, the Snake Creek Management Unit of the RJD State Forest, and the McCarthy Lake WMA and Weaver Bottoms of the Mississippi River, which are important waterfowl stopovers during migration seasons. In the Alma crossing area, USACE MDNR prefers that a route alternative north of the McCarthy WMA may reduce potential impacts to resources in this area.

To address MDNR's concern regarding the McCarthy Lake WMA, the Applicant identified a route option that would bypass McCarthy Lake WMA: Segment B58 would parallel the Canadian-Pacific railroad north along the westernmost boundary of McCarthy Lake WMA, would follow parcel lines and roads for 94 percent of the route to the river crossing location. Segment B58 would create newly impacted areas rather than utilize an existing transmission corridor.

4.0 North Rochester Substation to Northern Hills Substation 161 kV Section

Two potential routes were identified for the 161 kV transmission line between the North Rochester Substation siting area and the Northern Hills Substation. Figure J-5 in Appendix J shows the Preferred 161 kV Route.

4.1 Preferred 161 kV Route

The Preferred 161 kV Route was chosen because it follows roads or transmission lines for 89 percent of its length and roads, transmission or property lines for 100 percent of its length. The Preferred Route shares less corridor with the Douglas Trail than the Alternative Route. The segments identified for the Preferred 161 kV Route include: A191-B187-B114-B190-B186-B188-B191- B62-B171-B172-B174-B125-B169-B68-B156-B158-B66.

Segment combination B65-B124-B123-B130-B131 and segment B132 were eliminated because there is one home located in the ROW and because this combination would impact the greatest number of residences. Segments B154 and B157 were eliminated because they would impact more residences than the segment combination B68-B156-B158 and would follow less linear corridor. Segment combination B167-B170-B168 was eliminated for the same reasons as described for segments B154 and B157, when compared to segment combination B172-B174-B125-B169.

4.2 Alternative 161 kV Route

The Alternative 161 kV Route follows a combination of existing high-voltage transmission line corridor, roads, and the Douglas Trail. The Alternative Route follows transmission line corridor for 32 percent of the route. However, the route does not provide an opportunity to collocate the new line with existing facilities. Transportation and Douglas Trail adjacency accounts for 45 percent of the route and property lines are followed 12 percent of the route. In total, 88 percent of the route follows existing transmission, transportation, trails or property lines. Segments identified for the Alternative 161 kV Route (from northern substation siting area): A189-A188-A191-A190- B121-B147-B122-B145-B149-B150-B153-B152-B158-B66. Segments A189-A188 would parallel the existing Prairie Island-Byron 345 kV transmission line from the northern portion of the North Rochester Substation siting area.

Segment B148 was eliminated because there is one residence located in the ROW and because it would require additional angle structures when compared with segment combination B147-B122-B145-B149. Segment B64 was eliminated because it would cross the Pine Island golf course in and would follow 1.0 mile of the Douglas Trail. Segment B146 was eliminated because it parallels New Haven Road where there are several residences located near the road, would require 0.3 mile of tree clearing, and would require additional angle structures when compared with Segment B145. Segment B151 was eliminated because it would follow the Douglas Trail for its entire length (approximately 3.0 miles) and would cross through the town of Douglas, which has a high density of homes.

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Appendix J:
Segment Line Map

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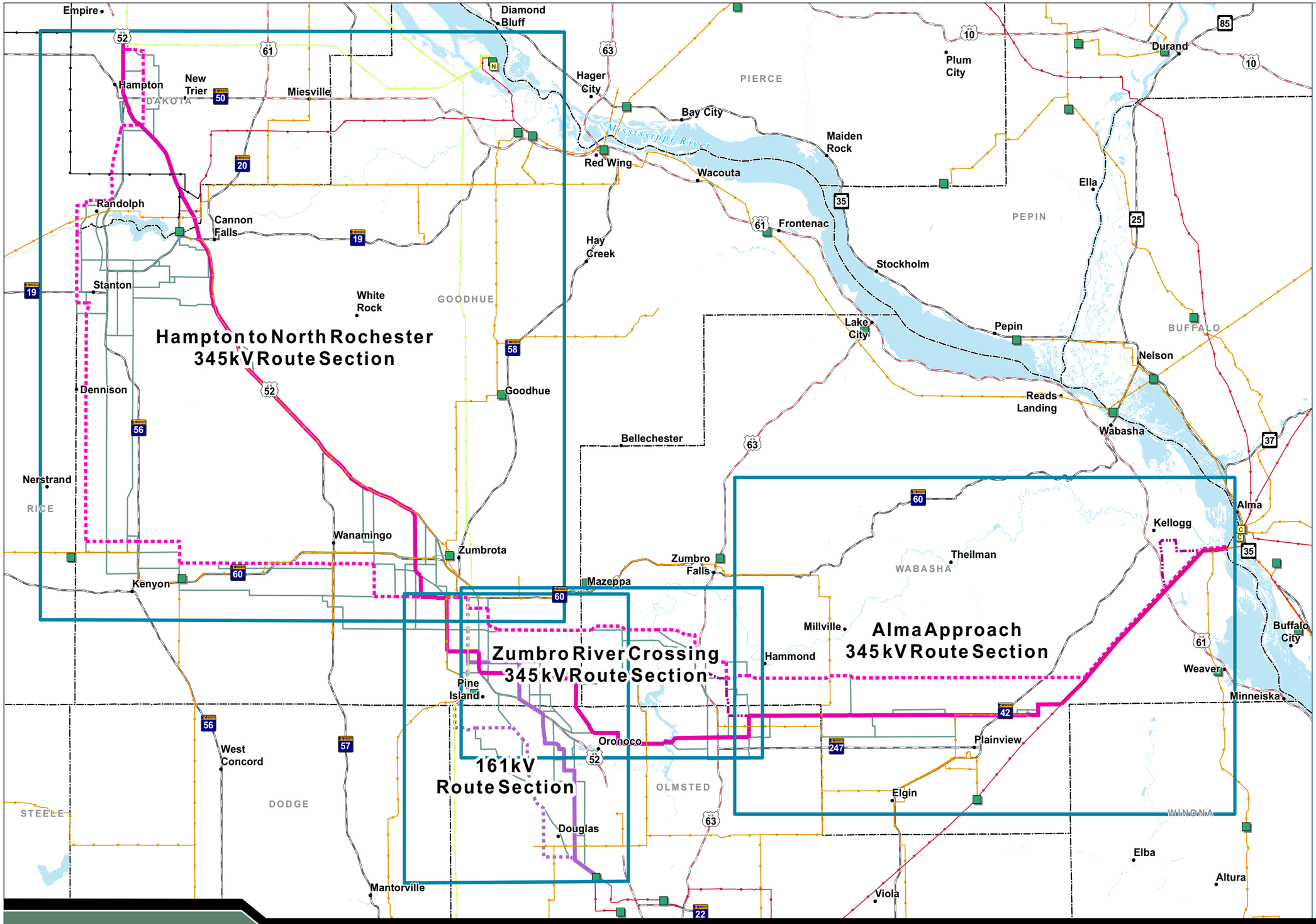

345 kV and 161 kV Index Map

Proposed Features

- 345 kV Preferred Route
- 345 kV Alternative Route
- 345 kV Route Option
- 161 kV Preferred Route
- 161 kV Alternative Route
- No Longer Considered Centerline Segment

Transportation
(BTS, ESRI)

- Interstate Highway
- US Highway
- State Highway
- County Highways
- Other Roads

Existing Transmission
(HDR, GRE)

- Substation
- Generation Facility
- 69 kV Transmission Line
- 115 kV Transmission Line
- 138 kV Transmission Line
- 161 kV Transmission Line
- 230 kV Transmission Line
- 345 kV Transmission Line

0 2 4 Miles

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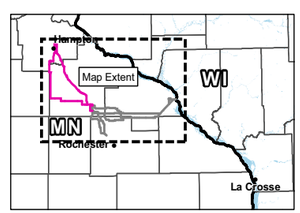

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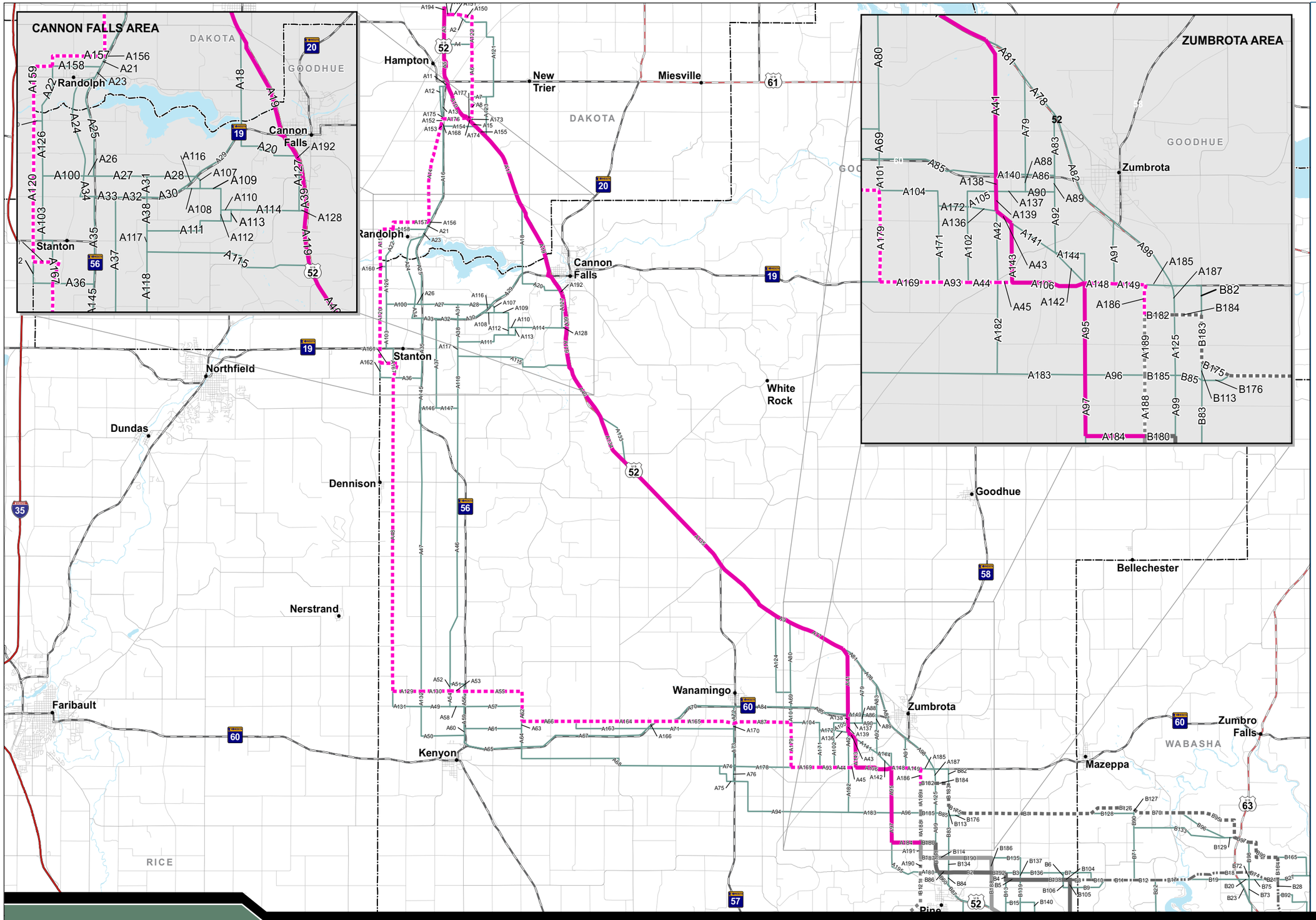
Hampton • Rochester • La Crosse 345 kV Transmission Project

All Segments Map
MN Route Permit Application

Figure J-1 Index Map



Hampton to North Rochester 345 kV Section

Proposed Features

- 345 kV Preferred Route
- 345 kV Alternative Route
- 345 kV Route Option
- 161 kV Preferred Route
- 161 kV Alternative Route
- No Longer Considered Centerline Segment

Transportation
(BTS, ESRI)

- Interstate Highway
- US Highway
- State Highway
- County Highways
- Other Roads

0 2 4 Miles

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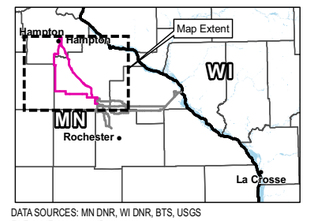

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Hampton • Rochester • La Crosse 345 kV Transmission Project

All Segments Map
MN Route Permit Application

Figure J-2 Hampton to North Rochester Area

Zumbro River Crossing 345 kV Section

Proposed Features

- 345 kV Preferred Route
- 345 kV Alternative Route
- 345 kV Route Option
- 161 kV Preferred Route
- 161 kV Alternative Route
- No Longer Considered Centerline Segment

Transportation
(BTS, ESRI)

- Interstate Highway
- US Highway
- State Highway
- County Highways
- Other Roads

Mazeppa
Zumbro Falls
Pine Island
Oronoco
Hammond
GOODHUE
WABASHA
OLMSTED

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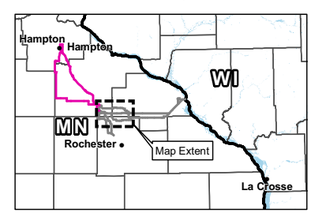

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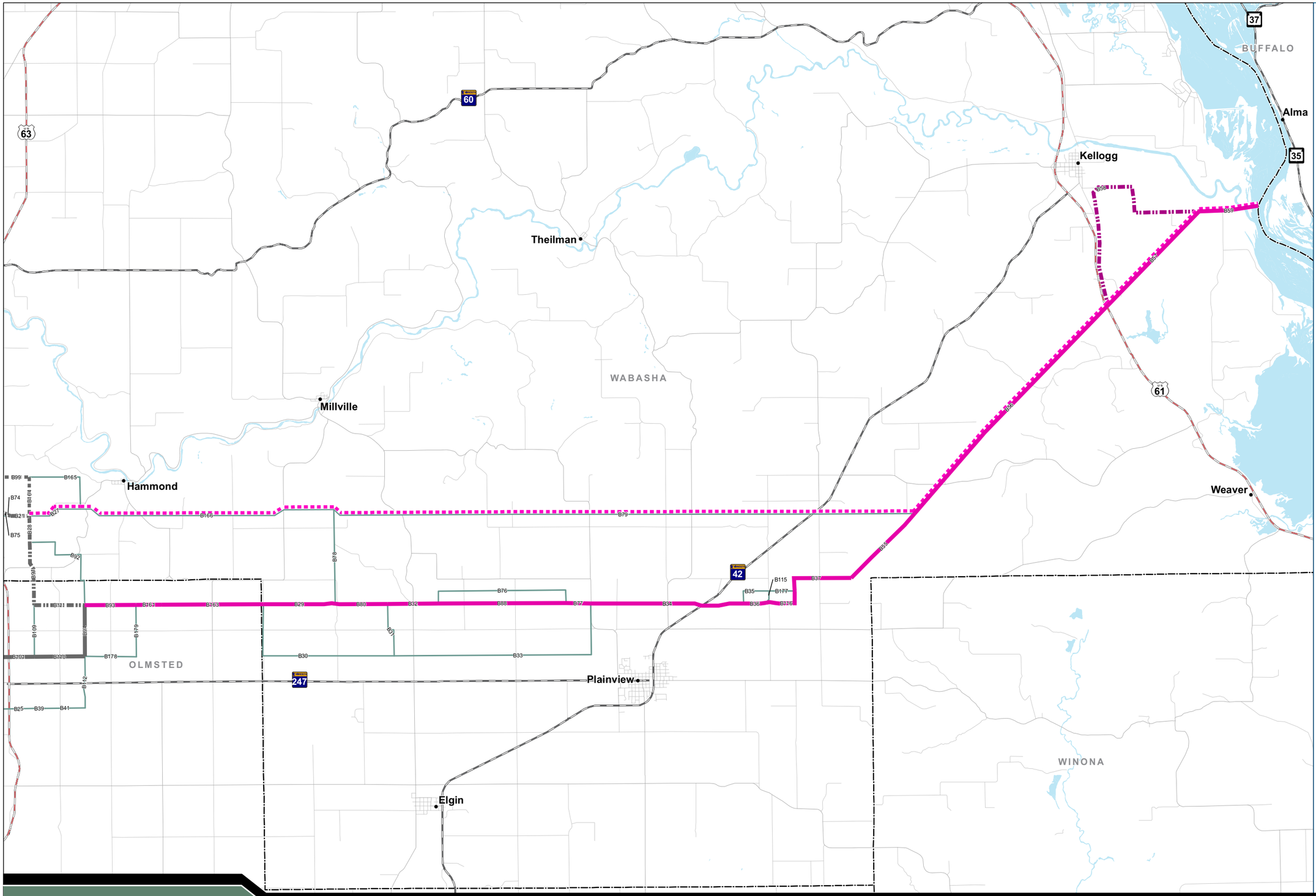
Hampton • Rochester • La Crosse 345 kV Transmission Project

All Segments Map
MN Route Permit Application

Figure J-3 Zumbro Area



Alma Approach 345 kV Section

Proposed Features

- 345 kV Preferred Route
- 345 kV Alternative Route
- 345 kV Route Option
- 161 kV Preferred Route
- 161 kV Alternative Route
- No Longer Considered Centerline Segment

Transportation
(BTS, ESRI)

- Interstate Highway
- US Highway
- State Highway
- County Highways
- Other Roads

345 kV Transmission Line

0 1 2 Miles

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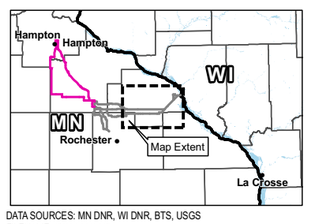

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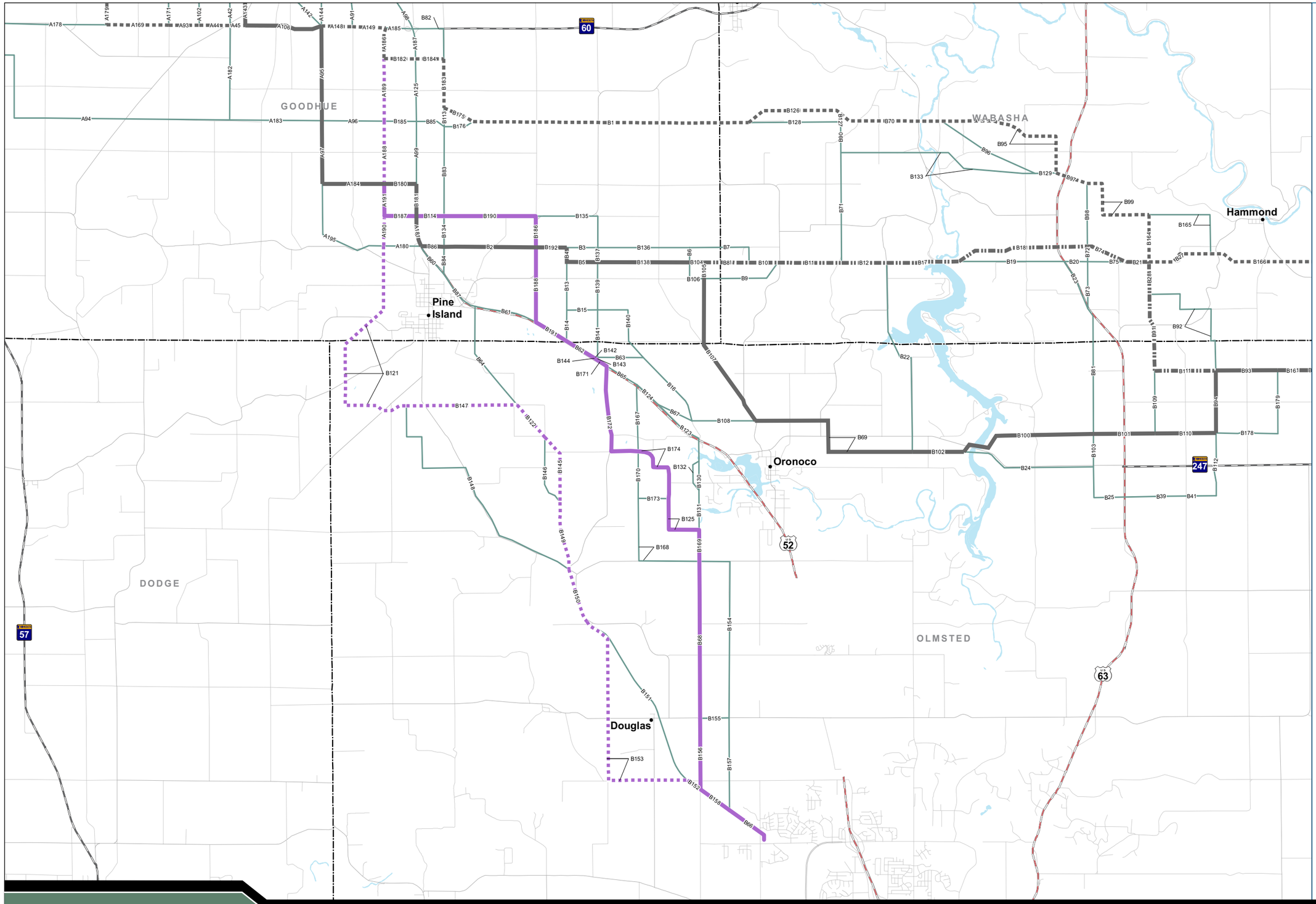
Hampton • Rochester • La Crosse 345 kV Transmission Project

All Segments Map
MN Route Permit Application

Figure J-4 Alma Approach



North Rochester to Northern Hills 161 kV Section

Proposed Features

- 345 kV Preferred Route
- 345 kV Alternative Route
- 345 kV Route Option
- 161 kV Preferred Route
- 161 kV Alternative Route
- No Longer Considered Centerline Segment

Transportation
(BTS, ESRI)

- Interstate Highway
- US Highway
- State Highway
- County Highways
- Other Roads

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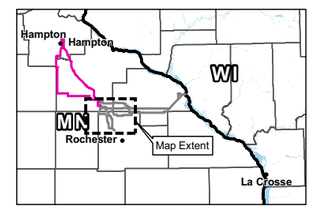

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Hampton • Rochester • La Crosse 345 kV Transmission Project

All Segments Map
MN Route Permit Application

Figure J-5 North Rochester to Northern Hills 161 kV Area

Appendix K:
Considered but Eliminated Routes – La Crescent and Winona

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Contents

Tables

Figures

1.0 Introduction

In developing routes for the Project, the Applicant evaluated multiple locations for crossing the Mississippi River. Two of the potential crossing locations were the La Crescent Mississippi River crossing (La Crescent crossing) and the Winona Mississippi River crossing (Winona crossing). This appendix summarizes the Applicant's analysis of the three routes associated with the La Crescent and Winona Mississippi River crossings that were considered for the Project. These routes were presented to the public during the June 2009 RUS public scoping meetings, but were later eliminated based upon the selection of the Alma crossing as the preferred crossing of the Mississippi River. A summary of the Mississippi River crossing analysis is provided in Chapter 5 of this Application.

The eliminated routes include two potential routes to the La Crescent crossing area (the La Crescent I-90 route and the La Crescent Property Lines route) and one route to the Winona crossing area (Winona route), shown on Figure 1.0-1. Each of the routes discussed in this appendix originate at the preferred North Rochester Substation siting area, northwest of Rochester, and terminate at either the La Crescent or the Winona crossing (1.0-1). All three routes share an alignment for approximately the first 30 miles between the preferred North Rochester Substation siting area and the vicinity of the Chester Substation, which is located approximately one-third mile north of US 14 and 50th Avenue SE, Rochester. Descriptions of the routes and the environmental setting associated with each route are described below. The term route is defined as the location of transmission line between two end points, and the route width is 1,000 feet wide.

2.0 La Crescent Interstate 90 Route

The La Crescent Interstate 90 (I-90) route is approximately 97 miles long (measuring from the North Rochester Substation siting area to the Minnesota/Wisconsin state line) and follows existing linear corridor, including U.S. Highway 52 and I-90, and property lines for approximately 75 miles. Table 2.0-1, below, shows the length and percentage of each type of existing linear feature that the La Crescent I-90 route follows. The route in its entirety is shown on Figure 1.0-1.

Table 2.0-1:
La Crescent I-90 Route – Length Paralleling Existing Linear Features

Total Length of Route	97.4
Percent (length) following transmission line	15% (14.3 miles)
Percent (length) following road or rail but not transmission line	32% (30.8 miles)
Percent (length) following property line but not transmission line, roads, or rail	31% (29.8 miles)
Percent (length) not following existing linear feature	23% (22.5 miles)

2.1 Route Description, North Rochester to Chester Substation Area

The western terminus of the route is the preferred North Rochester Substation siting area. The route parallels U.S.-52 south for approximately 1 mile to a point north of Pine Island. The route then continues east for approximately 5 miles following property lines to cross 230th Avenue. The route then continues south and crosses 510th Street, and then continues south until reaching Ash Avenue. It parallels Ash Avenue for approximately 1.5 miles. It continues east for approximately 1 mile, jogging south to cross White Bridge Rd and to avoid homes. The route then crosses the Zumbro River at White Bridge Road (the preferred Zumbro River crossing identified in Chapter 8 of this Application). The route continues to follow property lines east for approximately 5.0 miles before turning south. From this point, the route follows property lines south for approximately 4.5 miles to a point just southeast of the Chester Substation located approximately 0.5 mile northeast of the intersection of U.S. Highway 14 and 50th Avenue Southeast in Olmsted County.

2.2 Route Description, Chester Substation Area to La Crescent Crossing

From the vicinity of Chester Substation, the La Crescent I-90 route follows a railroad north of U.S. Highway 14 in an easterly direction for approximately 4 miles. It then follows property lines south for approximately 2.5 miles to I-90. The route then continues east, paralleling I-90 for approximately 22 miles.

Near the intersection with Winona County Road 25, the route leaves I-90 and follows an existing Dairyland 69 kV transmission line southeast for approximately 9 miles, then again parallels I-90 in a southeasterly direction for approximately 1.3 miles. From this point, the route turns south and east for 20 miles through the hills west of La Crescent. Approximately two-thirds of this distance does not follow a property line or an existing corridor. South of the La Crescent municipal boundary, the route follows MN 16 for approximately 1.25 miles at which point it follows an existing 69 kV transmission line owned by Xcel Energy for approximately 1.5 miles to the Mississippi River. A description and analysis of the Mississippi River La Crescent crossing is provided in Chapter 5 of this Application.

The following sections provide an overview of the existing environment and potential impacts associated with the La Crescent I-90 route.

2.3 Land Cover and Land Use

Land cover types identified within the route included cropland, grassland, shrubland, forest, aquatic, marshland, and urban. Table 2.3-1 shows the percent of land cover within the route. Land cover along the route is shown in Figure 2.3-1.

Table 2.3-1:
La Crescent I-90 Route—Land Cover Summary within Route

Land Cover Type	Percent of Route (rounded to nearest percent)
Cropland	52%
Grassland	23%
Shrubland (total)	1%
Lowland Shrub	<1%
Upland Shrub	<1%
Forest (total)	17%
Bur/White Oak	<1%
Cottonwood	0%
Maple/Basswood	<1%
All Others	16%
Aquatic (Total)	1%
Open water	<1%
Marshland	<1%
Urban (total)	6%
High Intensity Urban	2%
Low Intensity Urban	1%
Transportation	3%
Total	100

Source: MNDNR (2002).

2.4 Displacements

Table 2.4-1 lists the number of residences identified within 300 feet of the La Crescent I-90 route centerline. The Applicant did not identify any residences, businesses, or other structures within 75 feet of the La Crescent I-90 route centerline. Therefore, there would not be any displacements associated with this route.

Table 2.4-1:
Residences within 300 feet of the La Crescent I-90 Route Centerline

Proximity (feet)	Number of Residences
0–75 (Potential Displacements)[1]	0
75–150	10
150–300	32
Density (residences/linear mile)	0.3

[1] The ROW required is 150 feet, or 75 feet on either side of the centerline.

2.5 Recreation and Tourism

Most of the land within the La Crescent I-90 route is private and does not provide for public recreation opportunities. Recreational resources in proximity to the La Crescent I-90 route are identified on Figure 2.5-1. Minnesota has an extensive 20,000-mile-long snowmobile trail system. The majority of trails are maintained by local clubs and by MDNR (MDNR 2008). The route would cross multiple snowmobile trails, but because snowmobile trails are often relocated each winter, it is not possible to determine the exact number of crossings or the exact distance the route would parallel snowmobile trails.

The route would be located within 1 mile of two WMAs; the Haverhill and Eastside WMAs. The route would cross 18.9 miles, and approximately 2,407 acres of RJD Memorial Hardwood State Forest. The route also would cross approximately 42 acres of Chester Woods County Park (managed by Olmsted County).

Minnesota Highway 16, also known as the Historic Bluff Country Scenic Byway, is a national and state scenic byway located on the eastern municipal border of La Crescent, which travels west through the bluffs in the Mississippi River Valley. The La Crescent I-90 route would cross the scenic byway once in the city of La Crescent and would parallel the scenic byway for approximately 1.8 miles.

2.6 Transportation

The La Crescent I-90 route would parallel several different types of roadways, Interstate Highways, U.S. Highways, state highways, county roads, and local roads. Table 2.6-1 shows the length that the route would parallel each type of roadway. The route would parallel I-90 for approximately 23 miles. Transportation infrastructure is identified on Figure 2.6-1.

Table 2.6-1:
La Crescent I-90 Route—Roads Paralleled

Roadway Type	Distance Paralleled (miles)
Interstate Highways	23.0
U.S. Highways	5.4
State Highways	2.6
County Roads	28.4
Local Roads	1.4

Source: MNDOT 2007.

2.7 Land Based Economies

The route would permanently impact approximately 6.4 acres of agricultural land, and would temporarily impact approximately 535 acres of agricultural land. Approximately 1,112 acres of Prime Farmland, Prime Farmland if drained, and farmland of Statewide importance are located within the ROW. Agricultural land cover is identified on Figure 2.3-1, and Prime Farmland is identified on Figure 2.7-1.

Two aggregate mines were identified within the La Crescent I-90 route, shown on Figure 2.7-2. There would be no direct impacts to existing mining operations within the La Crescent I-90 route. If mining operations cannot be avoided, the Applicant would work with existing mine operators to identify the extent of current and planned mining operations and develop appropriate mitigation measures.

A potential impact to forestry resources would occur if the proposed routes are located in lands with Annual Timber Harvest Plans (AHPs). The La Crescent I-90 route would be located in St. Charles Township, which does have an AHP according to the MDNR Forestry Division Fiscal Year 2010 Harvest Plans (MDNR 2009). The route would not, however, cross any harvest plan sites. Total forested land cover crossed by the route is identified in Table 2.3-1. Impacts to forested areas would include tree clearing within the ROW or in construction staging areas.

2.8 Archaeological and Architectural

There are 27 archaeological sites documented within 1 mile of the La Crescent I-90 route centerline. There are two NRHP-listed sites within 1 mile of the route centerline, the Cameron Daniel House in La Crescent and the Christopher Krause Farmstead, south of Dover. There are 66 architectural sites within 1 mile of the route. NRHP sites are identified on Figure 2.8-1.

2.9 Water Resources

All streams crossed by the 150-foot ROW of the La Crescent I-90 route are listed in Table 2.9-1. The route crosses 28 streams, 11 of which are PWI streams under the regulatory jurisdiction of MDNR (MDNR 2009). Streams are shown on Figure 2.9-1.

Table 2.9-1:
La Crescent I-90 Route—Stream Crossings

Waterbody Name	Number of Crossings	PWI Stream (Yes/No)
Unnamed Tributary to Zumbro River, Middle Fork	10	no
Unnamed Tributary to Dry Run Creek	5	no
Unnamed Tributary to Zumbro River	9	no
Zumbro River	1	yes
Unnamed Tributary to Silver Spring Creek	7	no
Unnamed Tributary to Whitewater River, North Branch	4	no
Unnamed Tributary to Silver Creek	1	no
Silver Creek	1	yes
Unnamed Tributary to Bear Creek	9	no
Unnamed Tributary to Bear Creek	1	yes
Unnamed Tributary to Mill Creek	1	no
Unnamed Tributary to Whitewater River, South Branch	15	no
Unnamed Tributary to Whitewater River, South Branch	1	yes
Unnamed Tributary to Rush Creek	4	no
Rush Creek	1	yes
Unnamed Tributary to Ahrensfield Creek	5	no
Unnamed Tributary to Money Creek, West Branch	2	no
Unnamed Tributary to Money Creek	5	no
Unnamed Tributary to Corey Creek	3	no
Corey Creek	2	yes
Unnamed Tributary to Campbell Creek	2	no
Campbell Creek	1	yes
Looney Creek	1	yes
Silver Creek	1	yes

Table 2.9-1:
La Crescent I-90 Route—Stream Crossings

Waterbody Name	Number of Crossings	PWI Stream (Yes/No)
Unnamed Tributary to Pine Creek	9	no
Pine Creek	1	yes
unnamed Tributary to Oxbow Creek	1	no
Mississippi River	1	Yes

Source: MNDNR (2003).

Four surface waters crossed by the route are designated as impaired waters by the MPCA (2009):

- Bear Creek—turbidity
- Lake Zumbro—nutrients/eutrophication
- Mississippi River— polychlorinated biphenyls (PCBs)
- Silver Creek—turbidity

A summary of wetlands crossed by the 150-foot ROW of the La Crescent I-90 route is shown in Table 2.9-2. Locations of wetlands are shown in Figure 2.9-1. The 150-foot ROW of the route crosses NWI wetlands in 41 different locations, including 15 locations mapped as MDNR PWI wetlands. The total area of NWI wetlands within the 150-foot ROW of the route is approximately 32 acres, or 1.8 percent of the total ROW acreage. Less than 1 acre of permanent impacts to wetlands is anticipated and approximately 5.0 acres of temporary impacts to wetlands is anticipated along the route. Existing trees would be removed throughout the entire 150-foot ROW during construction of the transmission line in forested wetlands. Approximately 7 acres of forested wetlands would need to be cleared.

The La Crescent I-90 route crosses 15 FEMA floodplains, shown on Figure 2.9-1. The total area of floodplains within the 150-foot ROW is 1,770 acres. One of the floodplains is crossed is longer than the typical span distance of 1,000 feet. This floodplain is 6,348 feet, and would require six structures be placed in the floodplain. The route would result in 330 square feet of permanent impacts to FEMA floodplains.

Table 2.9-2:
NWI Wetlands Crossed by 150-foot ROW of La Crescent I-90 Route

Wetland Type	Total NWI Wetlands			Number of MDNR PWI Wetlands Crossed
	Count	Acres in ROW	% of ROW	
NWI Total	41	32	1.8%	15
L1UBHh	2	6.3	.4%	2
L2EMGh	2	4.5	.3%	2
PEM/SS1C	1	0.5	0%	0
PEMA	1	0.3	0%	0
PEMAd	1	0.0	0.0%	0
PEMB	2	0.4	0.0%	0
PEMBd	1	0.7	0.0%	0
PEMC	8	5.4	0.3%	0
PEMCd	1	0.7	0.0%	0
PEMCh	2	2.7	0.2%	2
PEMCx	1	0.1	0.0%	0
PEMFh	2	0.1	0.0%	1
PFO1A	2	1.0	0.1%	0
PFO1Ah	1	.9	0.1%	0
PFO1Ch	6	4.7	0.3%	6
PSS1C	1	0.3	0.0%	1
PSS1Cd	2	0.2	0.0%	0
PUBG	1	0.4	0.0%	0
PUBGh	4	2.9	0.2%	1

NWI Wetlands based on NWI data; % of ROW calculated as acreage within the ROW; Source: USFWS NWI, MDNR PWI
L1UBHh—Lacustrine, Limnetic, Unconsolidated Bottom, Permanently Flooded, Diked/Impounded wetlands
L2EMGh—Lacustrine, Littoral, Emergent, Intermittently Exposed, Diked/Impounded
PEM/SS1C—Palustrine, Emergent/Scrub-Shrub, Broad-Leaved Deciduous, Seasonally Flooded
PEMA—Palustrine, Emergent, Temporarily Flooded
PEMB—Palustrine, Emergent, Saturated
PEMC—Palustrine, Emergent, Seasonally Flooded
PEMCd—Palustrine, Emergent, Seasonally Flooded, Partially Drained/Ditched
PEMCh—Palustrine, Emergent, Seasonally Flooded, Diked/Impounded
PEMCx—Palustrine, Emergent, Seasonally Flooded, Excavated
PEMFh— Palustrine, Emergent, Semipermanently Flooded, Diked/Impounded
PFO1A—Palustrine, Forested, Broad-Leaved Deciduous, Temporarily Flooded
PFO1Ah— Palustrine, Forested, Broad-Leaved Deciduous, Temporarily Flooded, Diked/Impounded
PFO1Ch—Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded, Diked/Impounded
PSS1C—Palustrine, Scrub-Shrub, Broad-Leaved Deciduous, Seasonally Flooded
PSS1Cd— Palustrine, Scrub-Shrub, Broad-Leaved Deciduous, Seasonally Flooded, Partially Drained/Ditched
PUBG—Palustrine, Unconsolidated Bottom, Intermittently Exposed
PUBGh—Palustrine, Unconsolidated Bottom, Intermittently Exposed, Diked/Impounded

2.10 Flora/Fauna

The La Crescent I-90 route crosses approximately 4.1 miles of the Upper Mississippi National Fish and Wildlife Refuge. The route does not cross any designated GBCAs. There are 101 CRP lands within the route and 7 CREP lands within 1 mile of the route. Two WMAs are located within 1 mile of the route centerline. There are no SNAs within 1 mile of the La Crescent I-90 route. The La Crescent I-90 route crosses six state designated trout streams and one designated IBA. The route crosses approximately 19 acres of RJD Memorial Hardwood State Forest on private lands. Figure 2.10-1 shows conservation lands and designated wildlife areas in the Project area near the La Crescent I-90 route.

2.11 Rare and Unique

Figure 2.11-1 shows MCBS areas of outstanding, high, and moderate biodiversity. The La Crescent I-90 route does not cross any MCBS-designated areas of outstanding biodiversity significance. It crosses 2.8 miles of area with high biodiversity significance and 5.3 miles of area with moderate biodiversity significance (Table 2.11-1).

Table 2.11-1:
MCBS Biodiversity Sites Crossed by Route

Site Name	Location	Length of Crossing (mi)	Biodiversity Significance	Description of Site	Associated Rare and Unique Resources
Oronoco 12	Immediately east of Zumbro Lake	0.96	Moderate	Red Oak-White Oak Forest	None
Lawler's Prairie	Immediately north of where line crosses Collegeview Road East	0.01	Moderate	Dry Bedrock Bluff Prairie	1 state special concern plant species
St. Charles 35	Immediately east of where route crosses CR 37	0.62	Moderate	Red Oak-White Oak Forest	1 state special concern plant species
Rush Creek Valley	Approximately 1 mile east of where roué crosses CR 29, along I-90	0.08	Moderate	White Pine-Oak-Sugar Maple Forest	1 state special concern plant species; 1 non-listed rare plant; 1 non-listed amphibian.
Wiscoy Valley West	Less than a mile west of where the route crosses CR 19	0.24	Moderate	Unidentified	Dry bedrock bluff prairie.
North Corey Creek	Less than 1 mile southeast of where the route crosses State Route 76	0.16	Moderate	Unidentified	Dry bedrock bluff prairie.
Pleasant Hill 31 East	Approximately 1 mile north of where the route crosses CR 13	0.64	Moderate	Oak-Shagbark Hickory Woodland	1 state threatened reptile.
Pleasant Hill 34	Immediately west of where line crosses Looney Creek	0.10	Moderate	Southern Dry-Mesic Oak Forest	1 state threatened reptile.
Mound Prairie 3	At the crossing of Evans Hill Rd.	1.03	Moderate	Red Oak-White Oak (Sugar Maple) Forest	None

Table 2.11-1:
MCBS Biodiversity Sites Crossed by Route

Site Name	Location	Length of Crossing (mi)	Biodiversity Significance	Description of Site	Associated Rare and Unique Resources
La Cresent 22	Immediately west of where the route crosses State Route 16	1.30	Moderate	Red Oak-White Oak (Sugar Maple) Forest	1 state threatened plant; 2 state special concern plant species; 4 non-listed plants;1 non-listed reptile
Target Lake Area	Where route parallels Route 16	1.49	High	Northern Bulrush-Spikerush Marsh	1 state special concern bird species; 1 state threatened plant species; 1 state special concern plant species; 2 non-listed plant species
La Cresent Marsh	Immediately west of the Mississippi River crossing	1.31	High	Northern Bulrush-Spikerush Marsh/Swamp White Oak Terrace Forest	1 animal assemblage area; 1 state special concern bird species; 1 state threatened plant species; 1 state special concern plant species; and 4 non-listed plant species
Minnesota Island	At the Mississippi River Crossing	0.21	Moderate	Silver Maple-(Virginia Creeper) Floodplain Forest	1 non-listed terrestrial community; 1 state threatened plant species; 2 state special concern plant species; 2 non-listed plant species; 2 state special concern fish species; 1 state special concern bird species

Tables 2.11-2 and 2.11-3 present results of a search of the MNDR NHIS database for occurrence records of rare and unique species, and rare native communities within 1 mile of the La Crescent I-90 route centerline. There was one federal candidate species, the sheepnose mussel, with a documented element occurrence within 1 mile of the route centerline. There also are four MDNR Railroad ROW prairie sites within 1 mile of the route centerline.

Table 2.11-2:
La Crescent I-90 Route—Rare and Unique Species

Common Name	Scientific Name	Status
Wildlife Species		
Amphibians		
Northern cricket frog	*Acris crepitans*	SE
Pickerel frog	*Rana palustris*	Non-listed

Table 2.11-2:
La Crescent I-90 Route—Rare and Unique Species

Common Name	Scientific Name	Status
Birds		
Bald Eagle	*Haliaeetus leucocephalus*	SC
Cerulean Warbler	*Dendroica cerulea*	SC
Common Moorhen	*Gallinula chloropus*	SC
Fish		
American brook lamprey	*Lampetra appendix*	Non-listed
Black buffalo	*Ictiobus niger*	SC
Blue sucker	*Cycleptus elongatus*	SC
Bluntnose darter	*Etheostoma chlorosoma*	Non-listed
Paddlefish	*Polyodon spathula*	ST
Pallid shiner	*Notropis amnis*	SC
Pirate perch	*Aphredoderus sayanus*	SC
Pugnose minnow	*Opsopoeodus emiliae*	Non-listed
Shovelnose sturgeon	*Scaphirhynchusplatorynchus*	Non-listed
Yellow bass	*Morone mississippiensis*	SC
Mollusks		
Black sandshell	*Ligumia recta*	SC
Creek heelsplitter	*Lasmigona compressa*	SC
Elktoe	*Alasmidonta marginata*	ST
Ellipse	*Venustaconcha ellipsiformis*	ST
Fluted-shell	*Lasmigona costata*	SC
Hickorynut	*Obovaria olivaria*	SC
Pistolgrip	*Tritgonia verrucosa*	ST
Sheepnose	*Plethobasus cyphyus*	FC
Reptiles		
Blanding's turtle	*Emydoidea blandingii*	ST
Eastern fox snake	*Elaphe vulpine*	Non-listed
Milk snake	*Lampropeltis triangulum*	Non-listed
Timber rattlesnake	*Crotalus horridus*	ST
Vegetation Species		
Shrubs		
Buttonbush	*Cephalanthus occidentalis*	Non-listed

Table 2.11-2:
La Crescent I-90 Route—Rare and Unique Species

Common Name	Scientific Name	Status
Herbaceous Plants		
Beaked snakeroot	*Sanicula trifoliata*	SC
Catchfly grass	*Leersia lenticularis*	SC
Cattail sedge	*Carex typhina*	SC
Cliff goldenrod	*Solidago sciaphila*	SC
Davis' sedge	*Carex davisii*	ST
Ebony spleenwort	*Aspleniumplatyneuron*	SC
Glade mallow	*Napaea dioica*	ST
Goldie's fern	*Dryopteris goldiana*	SC
Gray's sedge	*Carex grayi*	Non-listed
Green dragon	*Arisaema dracontium*	Non-listed
Jewelled shooting star	*Dodecatheon amethystinum*	Non-listed
Lilia-leaved twayblade	*Liparis liliifolia*	Non-listed
Long-bearded hawkweed	*Hieracium longipilum*	Non-listed
Mild water pepper	*Polygonum hydropiperoides*	Non-listed
Muskingum sedge	*Carex muskingumensis*	Non-listed
Nodding wild onion	*Allium cernuum*	ST
Purple sandgrass	*Triplasis purpurea*	SC
Rattlesnake-master	*Eryngium yuccifolium*	SC
Rock clubmoss	*Huperzia porophila*	ST
Snowy campion	*Silene mivea*	ST
Sterile sedge	*Carex sterilis*	ST
Sweet-smelling Indian plantain	*Cacalia suaveolens*	SE
Tuberous Indian-plantain	*Arnoglossum plantagineum*	ST
Virginia water horehound	*Lycopus virginicus*	Non-listed
Walter's barnyard grass	*Echinochloa walteri*	Non-listed
White heath aster	*Aster pilosus*	Non-listed
White wild indigo	*Baptisia alba*	SC
Yellow pimpernel	*Taenidia integerrima*	Non-listed

Source: MNDR (2007).

FC Federal Candidate Species SC State Species of Concern SE State Endangered
ST State Threatened

Table 2.11-3:
La Crescent I-90 Route—Rare Native Plant Communities within 1 Mile of the Centerline

Community Type	Notes
Native Plant Community, Undetermined Class	Conifer wetland. A 10-acre larch swamp reportedly existed circa 1900. Since 1919, only six trees on a steep sandy west-southwest-facing slope along Pine Creek remain. Largest tree over 50 centimeters diameter at breast height, 90+ years old. Approximately 1 mile southwest of La Crescent.
Native Plant Community, Undetermined Class	Dissected, wet-mesic Franconia sandstone cliff. Several tiers of wide ledges circumjacent on north point of ridge-spur. Complex structure with several crevices, gullies, talus areas, sloughed boulders and rubble. Association: Bluntlobe cliff fern, brittle bladderfern.
Native Plant Community, Undetermined Class	Mature, dry-mesic/mesic oak forest. Canopy 30–85% cover. Gaps infrequent due to snags, tip-ups, select-logging. Co-dominant species: red oak, white oak, shagbark hickory, American elm, and northern pin oak.
Native Plant Community, Undetermined Class	Oak woodland (almost savanna); canopy 50% cover. Brush cover 25–50%. Patchy with prairie openings. Diverse prairie flora around sandstone residuum. Craggy bur oak, northern pin oak, white oak, and pines
Native Plant Community, Undetermined Class	Mature mesic oak forest with dry prairie inclusions. Heterogeneous canopy 80% cover, 20–25 meters height. Co-dominants: red oak, eastern black oak, black walnut, shagbark hickory, and rare pin oak.
Native Plant Community, Undetermined Class	Heterogeneous oak forest; not surveyed but air photos indicated quality due to uniform canopy height and cover (mostly oaks) on west aspect slope. North aspect with overgrown trails and tall patchy canopy but significant because forest descends to seepage area.
Native Plant Community, Undetermined Class	Mature, dry-mesic oak forest in two parcels. Canopy 70–85%, gaps common. Mostly 25–30 meter height. Dominant species: red oak, shagbark hickory, white oak, and bur oak.
Native Plant Community, Undetermined Class	Heterogeneous mesic oak forest with young maples on ravine alluvium. Red oak canopy >80% cover; elsewhere, canopy 50–75% cover. Co-dominants: red oak, white oak. Subcanopy 5–10 meters >75% cover.
Native Plant Community, Undetermined Class	Immature mesic oak forest on north-facing slopes/crests and in sandy ravine bottoms on bluff along small stream valley. Supercanopy of 40–50 centimeters red oak and shagbark hickory with American elm and aspen. Canopy (70% cover, 10–15 meters tall)
Native Plant Community, Undetermined Class	In protected backwater bays not influenced by direct flow of water; bounded by reed canarygrass meadows or silver maple forests and submergent/floating aquatic plants. Dominant species include arrowhead and river bulrush.
Native Plant Community, Undetermined Class	Mature forest dominated by red oak and basswood, both to 62 centimeters diameter at breast height. Canopy with sugar maple (common), bigtooth aspen, bur oak, white oak, black cherry (all uncommon). Canopy cover 90%.
Native Plant Community, Undetermined Class	Large emergent marsh bordering backwater sloughs and interspersed with small pools, black willow stands, willow thickets and areas dominated by reed canarygrass. Mostly dominated by river bulrush, bur-reed, broadleaf arrowhead
Native Plant Community, Undetermined Class	Dominated by northern pin oak. Canopy with black cherry (abundant); common hackberry, bitternut hickory, red oak (uncommon). Patchy subcanopy including white oak, American elm. Patchy shrub layer. Ground layer moderate species richness.
Native Plant Community, Undetermined Class	Dominated by American basswood with red oak and northern pin oak common. Canopy trees 25–30 centimeters diameter at breast height. Patchy subcanopy 3–20 meters high including bitternut hickory, black cherry, basswood, and white oak. Trees mostly multi-stemmed, young, post-logging origin. Patchy shrub layer.

Table 2.11-3:
La Crescent I-90 Route—Rare Native Plant Communities within 1 Mile of the Centerline

Community Type	Notes
Native Plant Community, Undetermined Class	Large meadow dominated mostly by hairy sedge and bluejoint reedgrass with areas dominated by tussock sedge or cattails. Moderate species diversity.
Native Plant Community, Undetermined Class	Observed from outside property: moderately mature dry-mesic forest dominated by red oak and white oak, with northern pin oak, black cherry, and basswood. Interrupted subcanopy includes much sugar maple. Patchy shrub layer.
Native Plant Community, Undetermined Class	Intermediate between woodland and forest. Canopy cover about 70%, mix of white oak, eastern black oak, bur oak, northern pin oak, all common, mature, somewhat open-grown. Subcanopy multi-layered: American elm, box elder, black cherry, paper birch.
Dry Bedrock Bluff Prairie (Southern) Type	Large prairie dominated by little bluestem, with high species richness including prairie dropseed, sideoats grama, groundplum milkvetch, prairie turnip; 40 native species documented. Some brush invasion, controlled by cutting. Southwest-facing.
Dry Bedrock Bluff Prairie (Southern) Type	Bluff prairie on small outcrops on southwest-facing slope at top of Zumbro River Valley. Parts overgrown with eastern red cedar, sumac, and aspen, but there is still prairie. Open areas dominated by sideoats grama, prairie dropseed, and Indian grass, with plains muhly and little bluestem.
Dry Bedrock Bluff Prairie (Southern) Type	Dry bluff prairie dominated by Indian grass, little bluestem, sideoats grama, purple lovegrass and prairie dropseed. Forb species abundant and well dispersed (leadplant, Great Plains lady's-tresses, and Canada lousewort.
Dry Bedrock Bluff Prairie (Southern) Type	Bluff prairies (On south to southwest slope of narrow bluff). Deciduous shrubs 20% cover, few junipers. South, southwest-aspect, elevation 900–1,100 feet upper slopes. Soils are cobbly, clay silt loam.
Dry Bedrock Bluff Prairie (Southern) Type	Five areas of bluff prairies on a highly dissected bluff dominated by little bluestem, Indian grass, prairie dropseed. Diverse forbs but sensitive species sparse and infrequent. Wood cover <25% with juniper.
Dry Bedrock Bluff Prairie (Southern) Type	Two over-grown bluff prairies with large openings. On south-aspect point of ridge-spur; prairie surrounded by eastern red cedar with scattered cedars throughout large opening to 30% cover. Farm road on lower edge of area.
Dry Bedrock Bluff Prairie (Southern) Type	Dry prairie, not likely to have been grazed. Woody invasion by deciduous shrubs, 40–50% cover. Prairie surrounded by immature oak forest. Prairie grasses and forbs visible from road. South aspect, at end of narrow ridge spur.
Dry Bedrock Bluff Prairie (Southern) Type	Natives include little bluestem (common), big bluestem, pasqueflower, prairie smoke, prairie turnip. Bluegrass common. Some brush encroachment, especially on edges. Steep west facing slope, grading to old fields above and below.
Dry Bedrock Bluff Prairie (Southern) Type	Three small prairies, totaling <10 acres, but good quality and managed by owner. Common graminoids: little bluestem, prairie dropseed, big bluestem; moderate forb diversity.
Dry Bedrock Bluff Prairie (Southern) Type	Eleven prairies on south to west-facing steep slopes in matrix of disturbed oak forest that was grazed in the past. Prairies also grazed, some presently. Native dominated, moderate diversity, though bluegrass common. Brush cover varies from 0 to 80% cover.
Black Oak-White Oak Woodland (Sand) Type	Mature forest dominated by northern pin oak (26–48 centimeters diameter at breast height). Canopy includes black oak, white oak, and bur oak. Trunks straight, single-stem. One recent northern pin oak stump with 80 rings. Shrubs common. Grazed in past (south portion with much bluegrass); few trees logged.

Table 2.11-3:
La Crescent I-90 Route—Rare Native Plant Communities within 1 Mile of the Centerline

Community Type	Notes
Colonial Waterbird Nesting Area	La Crescent. Yellow-crowned night heron. Habitat likely destroyed, housing development in area in 1990.
Southern Seepage Meadow/Carr Class	Significant wetland complex with diverse flora. Open water pools surrounded by at least four distinct vegetation zones: mixed emergent marsh (hairy sedge, tussock sedge, sweet flag); grazed sedge meadow dominated by fowl mannagrass; narrow red alder.
Sugar Maple-Basswood (Bitternut Hickory) Forest Type	Young maple-basswood forest dominated by oak and basswood, (to 30 centimeters diameter at breast height), paper birch, American hophornbeam, and sugar maple forming > 75% canopy coverage. No evidence of disturbance. On 20–70 degree north-facing slope with scattered cliff communities on outcrops.
River bed	Sand islands in cross channel of main island, sand banks, spits, low-lying backwater areas at junction with main channels and along sloughs. Marginal meadows dominated by rice cutgrass, prairie ironweed, reed canarygrass, and Emory sedge.
Silver Maple-(Virginia Creeper) Floodplain Forest Type	Lower elevations dominated by sugar maple; typical diameter at breast height varies among stands 10–25 centimeters to 30–50 centimeters (several trees with multiple trunks); infrequent large trees to 65 centimeters diameter at breast height. Green ash rare to 54 centimeters diameter at breast height. River birch infrequent along sloughs, 40–45 centimeters.
Freshwater Mussel Concentration Area	Various locations.
Swamp White Oak Terrace Forest Type	Mature swamp white oak forest. Canopy 85–100% cover, 25–30 meter height, dominants: sugar maple, swamp white oak, plains cottonwood, American elm, and river birch.
Calcareous Fen (Southeastern) Type	Western portion with several low sedge mats with hairy sedge common, surrounded by tussock sedge-dominated vegetation. East portion dominated by prairie sedge, hairyfruit sedge. Grazed by cattle until about 1985. Recently prescribe-burned by owner. On peat >4 feet deep.
Mesic Prairie (Southern) Type	Mesic prairie dominated by big bluestem and prairie cordgrass. Seems more intact than adjacent areas (few exotics and shrubs). Also has 100+ rattlesnake master and white wild indigo plants. Other species include leadplant and New Jersey tea.
White Pine-Oak-Sugar Maple Forest Type	Eastern white pine occurs around cliffs and on lower slope. Remainder of forest with white oak, northern pin oak, bur oak, black oak, bigtooth aspen, basswood, black walnut (diseased) in canopy; sugar maple, paper birch, bitternut hickory.
Algific Talus Type	40–50% canopy cover mostly yellow birch. Other notable species include alderleaf buckthorn, small enchanter's nightshade. Canadian yew, highbush cranberry, and slender cliffbrake. Occurs on lower north-northwest-facing slope above Rush Creek.

Source: MNDNR (2007).

2.12 Impact Summary for La Crescent I-90 Route

Table 2.12-1 presents a summary of environmental resource impacts for the La Crescent I-90 route based on analysis of the Minnesota routing criteria.

Table 2.12-1:
Summary Impacts for La Crescent I-90 Route

Resource Category	La Crescent I-90
Residences	
Number of Residences 0-75 feet from route centerline	0
Number of Residences 75-150 feet from route centerline	10
Number of Residences 150-300 feet from route centerline	32
Density (residences/linear mile)	0.3
Recreation and Tourism	
No impacts to recreation and tourism are anticipated	
Effects on Land-Based Economics	
Agriculture	
Permanent Impact	6.4 acres
Temporary Impact	535 acres
Forestry	No impacts to economically important forestry areas are anticipated.
Mining	No impacts to aggregate mines are anticipated.
Effects on Archaeological and Historic Resources (sites within one mile of route centerline)	
Archaeological	27 sites
Architectural	
National Register of Historic Places (NRHP)	2 sites
Architectural	66 sites
Natural Environment	
Water Resources	
Permanent Wetlands Impacts	<1 acre
Temporary Wetlands Impacts	5.0 acres
Acres of Forested Wetlands in ROW	7.0 acres
Stream Crossings	28
Permanent Impacts to Floodplains	<1 acre
Flora	
Percent Cropland	52%
Percent Grassland	23%
Percent Shrubland	1%
Percent Forested Land	17%
Percent Aquatic	1%
Fauna	
Number of CRP Lands Crossed	101
CREP Lands Crossed	0

Table 2.12-1:
Summary Impacts for La Crescent I-90 Route

Resource Category	La Crescent I-90
Length of IBAs Crossed	1
Length of GBAs Crossed	0
Number of Federal Rare and Unique Species Occurrences Within One Mile of Route Centerline	
Threatened	0
Endangered	0
Candidate	1
Special Concern	0
Number of State Rare and Unique Species Occurrences Within One Mile of Route Centerline	
Threatened	13
Endangered	2
Candidate	0
Species of Concern	20
DNR Rare Native Communities Crossed	39
Length of Outstanding Biodiversity Sites Crossed	0
Length of High Biodiversity Sites Crossed	2.8 miles
Length of Moderate Biodiversity Sites Crossed	5.1 miles
Use or Paralleling of existing ROW (transportation, pipeline, and electrical transmission systems) and property lines	
Total length of route (miles)	97.3
Length following Transmission Line	14.3
Percentage of route following Transmission Line	15%
Length following road but not Transmission Line (miles)	30.8
Percentage of route following road but not Transmission Line	32%
Length following property line but not transmission line or roads (miles)	29.8
Percentage of route following property line but not transmission line or roads	31%
Total length following transmission line, roads, and property lines (miles)	74.9
Percentage of route following transmission line, roads, or property lines	78%
Length not following transmission line, roads, or property lines (miles)	22.5
Percentage of route not following transmission line, roads, or property lines	23%

3.0 La Crescent Property Lines Route

The La Crescent Property Lines route between the North Rochester substation and the Mississippi River Crossing at La Crescent is 99 miles long. The route parallels existing linear corridor (transmission lines and roads) and property lines for approximately 74 miles. Table 3.0-1 shows the length and percentage of existing linear features that the La Crescent Property Lines route follows.

Table 3.0-1:
La Crescent Property Lines Route—Length Paralleling Existing Linear Features

Total length of Route	98.9 miles
Percent (length) following existing transmission line	18% (17.5 miles)
Percent (length) following road or rail but not transmission line	10% (10.1)
Percent (length) following property line but not transmission line, roads, or rail	47% (46.2)
Percent (length) not following existing linear feature	25% (25.1 miles)

3.1 Route Description

The La Crescent Property Lines route follows the same alignment as the La Crescent I-90 route for the initial 30 miles of the route, from the south end of the North Rochester Substation Siting Area to the vicinity of the Chester Substation. A detailed description of this portion of the route is located in Section 2.1 of this appendix.

From the Chester Substation, the route primarily follows property lines for approximately 17.3 miles. From this point, near Winona County Highway 39 and County Road 119, the route jogs south and east, crossing US 14 approximately 1 mile west of Utica. The route then generally runs easterly approximately 5.5 miles and turns south to I-90. The route then follows I-90 for approximately 2 miles and then leaves I-90 and follows the same route to La Crescent as the eastern portion of the I-90 route: Near the intersection with Winona County Road 25, the route leaves I-90 and follows an existing Dairyland 69 kV transmission line southeast for approximately 9 miles, again parallels I- 90 in a southeasterly direction for approximately 1.3 miles. From this point, the route turns south and east for 20 miles through the hills west of La Crescent. Approximately two-thirds of this distance does not follow a property line or an existing corridor. South of the La Crescent municipal boundary, the route follows MN 16 for approximately 1.25 miles at which point it follows an existing 69 kV transmission line owned by Xcel Energy for approximately 1.5 miles to the Mississippi River. A description and analysis of the Mississippi River La Crescent crossing is provided in Chapter 5 of this Application.

The following sections provide an overview of the existing environment and potential impacts associated with the La Crescent Property Lines route.

3.2 Land Cover and Land Use

Land cover types identified within the route includes cropland, grassland, shrubland, forest, aquatic, marshland, and urban. Table 3.2-1 shows the percent of land cover within the route. Land cover along the route is shown in Figure 2.3-1.

Table 3.2-1:
La Crescent Property Lines Route—Land Cover Summary within Route

Land Use Type	Percent of Route (rounded to nearest percent)
Cropland	58%
Grassland	21%
Shrubland (total)	<1%
Lowland Shrub	<1%
Upland Shrub	<1%
Forest (total)	16%
Bur/White Oak	<1%
Cottonwood	<1%
Maple/Basswood	<1%
All Others	16%
Aquatic (total)	1%
Open water	<1%
Marshland	<1%
Urban (total)	3%
High Intensity Urban	<1%
Low Intensity Urban	<1%
Transportation	2%
Total	100

Source: MNDNR (2002).

3.3 Displacements

Table 3.3-1 lists the number of residences identified within 300 feet of the La Crescent Property Lines route. The Applicant did not identify any residences, businesses, or other structures within the ROW of the La Crescent Property Lines route. Therefore, there would not be any displacements associated with this route.

Table 3.3-1:
Residences within 300 feet of the La Crescent Property Lines Route Centerline

Proximity (feet)	Number of Residences
0–75 (Potential Displacements)[1]	0
75–150	6
150–300	30
Density[2] (residences/linear mile)	0.4

[1] The ROW required is 150 feet, or 75 feet on either side of the centerline.

[2] Density is rounded to the nearest whole number.

3.4 Recreation and Tourism

Most of the land within and around the La Crescent Property Lines route is private and does not provide for public recreation opportunities. Recreational resources in proximity to the route are identified on Figure 2.5-1. The route crosses multiple snowmobile trails, but because snowmobile trails are often relocated each winter, it is not possible to determine the exact number of crossings or the exact distance the route parallels snowmobile trails.

The route does not cross any WMAs, but would be located within 1 mile of two WMAs, the Haverhill and Eastside WMAs. The route crosses approximately 15.8 miles of RJD Memorial Hardwood State Forest.

Minnesota Highway 16, also known as the Historic Bluff Country Scenic Byway, is a national and state scenic byway located on the eastern municipal border of La Crescent and travels west through the bluffs in the Mississippi River Valley. The La Crescent Property Lines route crosses the scenic byway once within the boundaries of the city of La Crescent and parallels the scenic byway for approximately 1.8 miles.

3.5 Transportation

The La Crescent Property Lines route parallels several different types of roadways, Interstate Highways, U.S. Highways, state highways, county roads, and local roads. Table 3.5-1 shows the length that the route parallels each type of roadway. The route parallels I-90 for approximately 3.3 miles. Transportation infrastructure is identified on Figure 2.6-1.

Table 3.5-1:
La Crescent Property Lines Route—Roads Paralleled

Roadway	Distance Paralleled
Interstate Highways	3.3
U.S. Highways	1.4
State Highways	1.8
County Roads	11.7
Local Roads	1.1

Source: Mn/DOT (2002).

3.6 Land-Based Economies

The route would permanently impact approximately 7.2 acres of agricultural land, and would temporarily impact approximately 542.8 acres of agricultural land. Approximately 1,167.8 acres of prime farmland, prime farmland if drained, and prime farmland of statewide importance would be located within the ROW. Agricultural land cover is identified on Figure 2.3-1 and prime farmland is identified on Figure 2.7-1.

One aggregate mine was identified within the La Crescent Property Lines route. Aggregate mines are identified on Figure 2.7-2. There would be no direct impacts to existing mining operations within the La Crescent I-90 route. If mining operations cannot be avoided, the Applicant would work with existing mine operators to identify the extent of current and planned mining operations and develop appropriate mitigation measures.

A potential impact to forestry resources would occur if the route crossed lands with Annual Timber Harvest Plans (AHPs). The La Crescent Property Lines route would not impact any economically viable forestry resources. Forested land cover, outside of economically-important forestry areas are identified in Table 2.3-1. Impacts to forested areas may include tree clearing within the ROW or in construction staging areas.

3.7 Archaeological and Architectural

There are 25 archaeological sites documented within 1 mile of the La Crescent Property Lines route centerline. There are two NRHP-listed sites within 1 mile from the route centerline; the Cameron Daniel House in La Crescent, and the Benjamin Ellsworth House in Utica. There are 70 architectural sites within 1 mile of the route. NRHP-listed sites are identified on Figure 2.8-1.

3.8 Water Resources

All streams crossed by the 150-foot ROW of the La Crescent Property Lines route are listed in Table 3.8-1. The route crosses 31 streams, 13 of which are PWI streams under the regulatory jurisdiction of MDNR (MDNR 2009). Streams are shown in Figure 2.9-1.

Table 3.8-1:
La Crescent Property Lines Route – Stream Crossings

Waterbody Name	Number of Crossings	PWI Stream (Yes/No)
Unnamed Tributary to Zumbro River, Middle Fork	10	no
Unnamed Tributary to Dry Run Creek	5	no
Unnamed Tributary to Zumbro River	9	no
Zumbro River	1	yes
Unnamed Tributary to Silver Spring Creek	7	no
Unnamed Tributary to Whitewater River, North Branch	4	no
Unnamed Tributary to Silver Creek	1	no
Silver Creek	1	yes
Unnamed Tributary to Bear Creek	13	no
Unnamed Tributary to Trib 6, Middle Branch	8	no
Trib 6, Middle Branch	2	yes
Whitwater River, Middle Branch	1	yes
Unnamed Tributary to Whitewater River, Middle Branch	1	yes
Unnamed Tributary to Whitewater River, Middle Branch	5	no
Unnamed Tributary to Whitewater River, South Branch	8	no
Whitewater River, South Branch	1	yes
Unnamed Tributary to Rush Creek	11	no
Rush Creek	1	yes
Unnamed Tributary to Ahrensfield Creek	5	no
Unnamed Tributary to Money Creek, West Branch	2	no
Unnamed Tributary to Money Creek	6	no
Unnamed Tributary to Corey Creek	3	no
Corey Creek	2	yes
Unnamed Tributary to Campbell Creek	2	no

Table 3.8-1:
La Crescent Property Lines Route – Stream Crossings

Waterbody Name	Number of Crossings	PWI Stream (Yes/No)
Campbell Creek	1	yes
Looney Creek	1	yes
Silver Creek	1	yes
Unnamed Tributary to Pine Creek	9	no
Pine Creek	1	yes
Unnamed Tributary to Oxbow Creek	1	no
Mississippi River	1	Yes

Source: MNDNR (2003).

Five surface waters crossed by the route are designated as impaired waters by the MPCA (2009):

- Whitewater River, Middle Fork—turbidity
- Whitewater River, South Fork—turbidity
- Lake Zumbro—nutrients/eutrophication
- Mississippi River—PCBs
- Silver Creek—turbidity

A summary of wetlands crossed by the 150-foot ROW of the La Crescent Property Lines route is shown in Table 3.8-2. The 150-foot ROW of the route crosses NWI wetlands in 39 different locations, including 16 locations mapped as a MDNR PWI wetland. The total area of NWI wetlands within the 150-foot ROW of the route is approximately 32.1 acres, or 1.8 percent of the total ROW acreage. Less than 1 acre of permanent impacts to wetlands is anticipated and approximately 5.0 acres of temporary impacts to wetlands is anticipated along the route. Existing trees would be removed throughout the entire 150-foot ROW during construction of the transmission line in forested wetlands. Approximately 6 acres of forested wetlands would need to be cleared.

The La Crescent Property Lines route crosses 23 FEMA floodplains, shown on Figure 2.9-1. The total area of floodplains within the 150-foot ROW is 1,799 acres. Two of the floodplains crossed by the route are longer than the typical span distance of 1,000 feet. One floodplain, which is associated with the Mississippi River, is 5,897 feet in length, would require that five structures be placed in the floodplain, and the other floodplain, which is associated with the Whitewater River, which is 1,080 feet in length, would require that one structure be placed in the floodplain. The route would result in approximately 330 square feet of permanent impacts to FEMA floodplains.

Table 3.8-2:
NWI Wetlands Crossed by 150-foot ROW of La Crescent Property Lines Route

Wetland Type	Total NWI Wetlands			Number of MDNR PWI Wetlands Crossed
	Count	Acres in ROW	% of ROW	
NWI Total	39	32.1	1.8%	16
L1UBHh	2	6.3	.3%	2
L2EMGh	2	4.5	0.3%	2
PEM/SSC1	1	0.5	0.0%	0
PEM/FO1Ad	1	0.3	0.0%	0
PEMC	8	4.7	0.3%	0
PEMCd	3	1.3	0.1%	0
PEMCh	2	2.7	0.2%	2
PEMFh	3	0.3	0.0%	1
PSS1Ch	1	0.1	0.0%	1
PFO1Ah	1	0.9	0.1%	0
PFO1Ch	6	4.7	0.3%	6
PSS1C	1	1.4	0.1%	1
PSS1Cd	1	0.1	0.0%	0
PUBG	2	0.7	0.0%	0
PUBGh	4	3.4	0.2%	1
PUBGx	1	0.2	0.0%	0

NWI Wetlands based on NWI data; % of ROW calculated as acreage within the ROW; Source: USFWS NWI, MDNR PWI
L2EMGh—Lacustrine, Littoral, Emergent, Intermittently Exposed, Diked/Impounded
PEMCh—Palustrine, Emergent, Seasonally Flooded, Diked/Impounded wetlands
PSS1Ch—Palustrine, Scrub-Shrub, Broad-Leaved Decidious, Diked/Impounded
PEMFh—Palustrine, Emergent, Semipermanently Flooded, Diked/Impounded
PUBGh—Palustrine, Unconsolidated Bottom, Intermittently Exposed, Diked/Impounded
L1UBHh—Lacustrine, Limnetic, Unconsolidated Bottom, Permanently Flooded, Diked/Impounded wetlands
PSS1C—Palustrine, Scrub-Shrub, Broad-Leaved Deciduous, Seasonally Flooded wetlands

3.9 Flora/Fauna

The La Crescent Property Lines route crosses 4.1 miles of the Upper Mississippi River National Fish and Wildlife Refuge. The route does not cross any designated GBCAs. There are 87 CRP lands located within the route and there are 10 CREP lands located within 1 mile of the route centerline. Two WMAs are located within 1 mile of the route centerline, but are not crossed by the route. No SNAs are located within 1 mile of the route centerline. This route crosses seven state designated trout streams and one

designated IBA. The route crosses approximately 15.8 acres of private lands in the RJD Memorial Hardwood State Forest. Figure 2.10-1 shows conservation lands and designated wildlife areas in the Project area near the La Crescent Property Lines route.

3.10 Rare and Unique Resources

Figure 2.11-1 shows areas identified by the MCBS as having outstanding, high, or moderate biodiversity significance. The La Crescent Property Lines route does not cross any MCBS-designated areas of outstanding biodiversity significance. It crosses approximately 2.8 miles of area with high biodiversity significance and 4.5 miles of area with moderate biodiversity significance (Table 3.10-1).

Tables 3.10-2 and 3.10-3 present results of a search of the MNDR NHIS database for occurrence records of rare and unique species, and rare native communities within 1 mile of the La Crescent Property Lines route centerline. There is one federal candidate species, the sheepnose mussel, with a documented element occurrence within 1 mile of the route centerline. There is one DNR Railroad ROW prairie site within 1 mile of the route centerline.

Table 3.10-1:
MCBS Biodiversity Sites Crossed by Route

Site Name	Location	Length of Crossing (mi)	Biodiversity Significance	Description of Site	Associated Rare and Unique Resources
Oronoco 12	Immediately east of Zumbro Lake	0.96	Moderate	Red Oak-White Oak Forest	None
Lawler's Prairie	Immediately north of where line crosses Collegeview Road East	0.01	Moderate	Dry Bedrock Bluff Prairie	1 state special concern plant species
Utica 36	Approximately 0.5 miles north of where line meets I-90	0.16	Moderate	Southern Dry-Mesic Oak Forest/White Pine-Oak-Sugar Maple	None
Wiscoy Valley West	Less than a mile west of where the route crosses CR 19	0.24	Moderate	Unidentified	Dry bedrock bluff prairie.
North Corey Creek	Less than 1 mile southeast of where the route crosses State Route 76	0.16	Moderate	Unidentified	Dry bedrock bluff prairie.
Pleasant Hill 31 East	Approximately 1 mile north of where the route crosses CR 13	0.64	Moderate	Oak-Shagbark Hickory Woodland	1 state threatened reptile
Pleasant Hill 34	Immediately west of where line crosses Looney Creek	0.10	Moderate	Southern Dry-Mesic Oak Forest	1 state threatened reptile
Mound Prairie 3	At the crossing of Evans Hill Rd	1.03	Moderate	Red Oak-White Oak (Sugar Maple) Forest	None

Table 3.10-1:
MCBS Biodiversity Sites Crossed by Route

Site Name	Location	Length of Crossing (mi)	Biodiversity Significance	Description of Site	Associated Rare and Unique Resources
La Cresent 22	Immediately west of where the route crosses State Route 16	1.30	Moderate	Red Oak-White Oak (Sugar Maple) Forest	1 state threatened plant species; 2 state special concern plant species; 4 non-listed plant species; 1 non-listed reptile species
Target Lake Area	Where route parallels Route 16	1.48	High	Northern Bulrush-Spikerush Marsh	1 state special concern bird species; 1 state threatened plant species; 1 state special concern plant species; 2 non-listed plant species
La Cresent Marsh	Immediately west of the Mississippi River crossing	1.31	High	Northern Bulrush-Spikerush Marsh/Swamp White Oak Terrace Forest	1 animal assemblage area; 1 state special concern bird species; 1 state threatened plant species; 1 state special concern plant species; 4 non-listed plant species
Minnesota Island	At the Mississippi River Crossing	0.21	Moderate	Silver Maple-(Virginia Creeper) Floodplain Forest	1 non-listed terrestrial community; 1 state threatened plant species; 2 state special concern plant species; 2 non-listed plants; 2 state special concern fish; 1 state special concern bird species

Table 3.10-2:
La Crescent Property Lines Route—Rare and Unique Species

Common Name	Scientific Name	Status
Wildlife Species		
Amphibians		
Northern cricket frog	*Acris crepitans*	SE
Pickerel frog	*Rana palustris*	Non-listed
Birds		
Bald Eagle	*Haliaeetus leucocephalus*	SC
Cerulean Warbler	*Dendroica cerulea*	SC
Common Moorhen	*Gallinula chloropus*	SC
Loggerhead Shrike	*Lanius ludovicianus*	ST
Wilson's Phalarope	*Phalaropus tricolor*	ST
Fish		
American brook lamprey	*Lampetra appendix*	Non-listed
Black buffalo	*Ictiobus niger*	SC
Blue sucker	*Cycleptus elongatus*	SC
Bluntnose darter	*Etheostoma chlorosoma*	Non-listed
Paddlefish	*Polyodon spathula*	ST
Pallid shiner	*Notropis amnis*	SC
Pirate perch	*Aphredoderus sayanus*	SC
Pugnose minnow	*Opsopoeodus emiliae*	Non-listed
Shovelnose sturgeon	*Scaphirhynchus platorynchus*	Non-listed
Yellow bass	*Morone mississippiensis*	SC
Mollusks		
Black sandshell	*Ligumia recta*	SC
Creek heelsplitter	*Lasmigona compressa*	SC
Elktoe	*Alasmidonta marginata*	ST
Ellipse	*Venustaconcha ellipsiformis*	ST
Fluted-shell	*Lasmigona costata*	SC
Hickorynut	*Obovaria olivaria*	SC
Pistolgrip	*Tritgonia verrucosa*	ST
Sheepnose	*Plethobasus cyphyus*	FC

Table 3.10-2:
La Crescent Property Lines Route—Rare and Unique Species

Common Name	Scientific Name	Status
Reptiles		
Blanding's turtle	*Emydoidea blandingii*	ST
Eastern fox snake	*Elaphe vulpine*	Non-listed
Milk snake	*Lampropeltis triangulum*	Non-listed
Timber rattlesnake	*Crotalus horridus*	ST
Vegetation Species		
Shrubs		
Buttonbush	*Cephalanthus occidentalis*	Non-listed
Herbaceous Plants		
Beaked snakeroot	*Sanicula trifoliata*	SC
Catchfly grass	*Leersia lenticularis*	SC
Cattail sedge	*Carex typhina*	SC
Cliff goldenrod	*Solidago sciaphila*	SC
Davis' sedge	*Carex davisii*	ST
Ebony spleenwort	*Aspleniumplatyneuron*	SC
Glade mallow	*Napaea dioica*	ST
Goldie's fern	*Dryopteris goldiana*	SC
Gray's sedge	*Carex grayi*	Non-listed
Green dragon	*Arisaema dracontium*	Non-listed
Jewelled shooting star	*Dodecatheon amethystinum*	Non-listed
Lilia-leaved twayblade	*Liparis liliifolia*	Non-listed
Long-bearded hawkweed	*Hieracium longipilum*	Non-listed
Mild water pepper	*Polygonum hydropiperoides*	Non-listed
Muskingum sedge	*Carex muskingumensis*	Non-listed
Nodding wild onion	*Allium cernuum*	ST
Purple sandgrass	*Triplasis purpurea*	SC
Rattlesnake-master	*Eryngium yuccifolium*	SC
Rock clubmoss	*Huperzia porophila*	ST
Snowy campion	*Silene mivea*	ST
Sterile sedge	*Carex sterilis*	ST
Sweet-smelling Indian plantain	*Cacalia suaveolens*	SE

Table 3.10-2:
La Crescent Property Lines Route—Rare and Unique Species

Common Name	Scientific Name	Status
Tuberous Indian-plantain	*Arnoglossum plantagineum*	ST
Upland boneset	*Eupatorium sessilifolium*	ST
Virginia water horehound	*Lycopus virginicus*	Non-listed
Walter's barnyard grass	*Echinochloa walteri*	Non-listed
White heath aster	*Aster pilosus*	Non-listed
White wild indigo	*Baptisia alba*	SC
Yellow pimpernel	*Taenidia integerrima*	Non-listed

Source: MNDR (2007).

FC Federal Candidate SC State Species of Concern SE State Endangered
ST State threatened

Table 3.10-3:
La Crescent Property Lines Route—Rare Native Plant Communities within 1 Mile of the Centerline

Community Type	Notes
Sugar Maple-Basswood-(Bitternut Hickory) Forest	Young maple-basswood forest dominated by red oak, northern pin oak, paper birch, and sugar maple. On 20–70 degree north-facing slope with scattered cliff communities on outcrops.
Native Plant Community, Undetermined Class	Conifer wetland. A 10-acre larch swamp reportedly existed circa 1900. Since 1919, only six trees on a steep sandy west-southwest-facing slope along Pine Creek remain. Largest tree over 50 centimeters diameter at breast height, 90+ years old. Approximately 1 mile southwest of La Crescent.
Native Plant Community, Undetermined Class	Dissected, wet-mesic Franconia sandstone cliff. Several tiers of wide ledges circumjacent on north point of ridge-spur. Complex structure with several crevices, gullies, talus areas, sloughed boulders and rubble. Association: Bluntlobe cliff fern, brittle bladderfern.
Native Plant Community, Undetermined Class	Mature, dry-mesic/mesic oak forest. Canopy 30–85% cover. Gaps infrequent due to snags, tip-ups, select-logging. Co-dominant species: red oak, white oak, shagbark hickory, American elm, and northern pin oak.
Native Plant Community, Undetermined Class	Oak woodland (almost savanna); canopy 50% cover. Brush cover 25–50%. Patchy with prairie openings. Diverse prairie flora around sandstone residuum. Craggy bur oak, northern pin oak, white oak and pines
Native Plant Community, Undetermined Class	Mature mesic oak forest with dry prairie inclusions. Heterogeneous canopy 80% cover, 20–25 meters height. Co-dominants: red oak, eastern black oak, black walnut, shagbark hickory, and rare pin oak.
Native Plant Community, Undetermined Class	Heterogeneous oak forest; not surveyed but air photos indicated quality due to uniform canopy height and cover (mostly oaks) on west aspect slope. North aspect with overgrown trails and tall patchy canopy but significant because forest descends to seepage area.
Native Plant Community, Undetermined Class	Mature, dry-mesic oak forest in two parcels. Canopy 70–85%, gaps common. Mostly 25–30 meters height. Dominant species: red oak, shagbark hickory, white oak, and bur oak.
Native Plant Community, Undetermined Class	Heterogeneous mesic oak forest with young maples on ravine alluvium. Red oak canopy >80% cover. Elsewhere, canopy 50–75% cover. Co-dominants: red oak, white oak. Subcanopy 5–10 meters >75% cover.
Native Plant Community, Undetermined Class	Immature mesic oak forest on north-facing slopes/crests and in sandy ravine bottoms on bluff along small stream valley. Supercanopy of 40–50centimeters red oak and shagbark hickory with American elm and aspen. Canopy (70% cover, 10-15 meters tall)
Native Plant Community, Undetermined Class	In protected backwater bays not influenced by direct flow of water; bounded by reed canarygrass meadows or silver maple forests and submergent/floating aquatic plants. Dominant species include arrowhead and river bulrush.
Native Plant Community, Undetermined Class	Large emergent marsh bordering backwater sloughs and interspersed with small pools, black willow stands, willow thickets and areas dominated by reed canarygrass. Mostly dominated by river bulrush, bur-reed, broadleaf arrowhead
Native Plant Community, Undetermined Class	Large meadow dominated mostly by hairy sedge and bluejoint reedgrass with areas dominated by tussock sedge or cattails. Moderate species diversity.

Table 3.10-3:
La Crescent Property Lines Route—Rare Native Plant Communities within 1 Mile of the Centerline

Community Type	Notes
Native Plant Community, Undetermined Class	Observed from outside property: moderately mature dry-mesic forest dominated by red oak and white oak, with northern pin oak, black cherry and basswood. Interrupted subcanopy includes much sugar maple. Patchy shrub layer.
Native Plant Community, Undetermined Class	Intermediate between woodland and forest. Canopy cover about 70%, mix of white oak, eastern black oak, bur oak, northern pin oak, all common, mature, somewhat open-grown. Subcanopy multi-layered: American elm, box elder, black cherry, paper birch.
Dry Bedrock Bluff Prairie (Southern) Type	Bluff prairie on small outcrops on southwest-facing slope at top of Zumbro River Valley. Parts overgrown with eastern red cedar, sumac, and aspen, but there is still prairie. Open areas dominated by sideoats grama, prairie dropseed, and Indian grass, with plains muhly and little bluestem.
Dry Bedrock Bluff Prairie (Southern) Type	Dry bluff prairie dominated by Indian grass, little bluestem, sideoats grama, purple lovegrass, and prairie dropseed. Forb species abundant and well dispersed (leadplant, Great Plains lady's-tresses, and Canada lousewort.
Dry Bedrock Bluff Prairie (Southern) Type	Bluff prairies (On south to southwest slope of narrow bluff). Deciduous shrubs 20% cover, few junipers. South, southwest-aspect, elevation 900–1,100 feet upper slopes. Soil is cobbly, clay silt loam.
Dry Bedrock Bluff Prairie (Southern) Type	Five areas of bluff prairies on a highly dissected bluff dominated by little bluestem, Indian grass, prairie dropseed. Diverse forbs but sensitive species sparse and infrequent. Wood cover <25% with juniper.
Dry Bedrock Bluff Prairie (Southern) Type	Two over-grown bluff prairies with large openings. On south-aspect point of ridge-spur; prairie surrounded by eastern red cedar with scattered cedars throughout large opening to 30% cover. Farm road on lower edge of area.
Dry Bedrock Bluff Prairie (Southern) Type	Dry prairie, not likely to have been grazed. Woody invasion by deciduous shrubs, 40–50% cover. Prairie surrounded by immature oak forest. Prairie grasses and forbs visible from road. South aspect, at end of narrow ridge spur.
Dry Bedrock Bluff Prairie (Southern) Type	Three small prairies, totaling <10 acres, but good quality and managed by owner. Common graminoids: little bluestem, prairie dropseed, big bluestem; moderate forb diversity.
Dry Bedrock Bluff Prairie (Southern) Type	Eleven prairies on south to west-facing steep slopes in matrix of disturbed oak forest that was grazed in the past. Prairies also grazed, some presently. Native dominated, moderate diversity, though bluegrass common. Brush cover varies from 0 to 80% cover.
Colonial Waterbird Nesting Area	La Crescent. Yellow-crowned night heron. Habitat likely destroyed, housing development in area in 1990.
Mesic Prairie (Southern) Type	Narrow, 1.5-mile-long strip of disturbed prairie along railroad grade. Dominated by bluegrass and, in patches, smooth brome. About 50% cover by trees and shrubs, with quaking aspen common.
Mesic Prairie (Southern) Type	Mesic prairie dominated by big bluestem and prairie cordgrass. Seems more intact than adjacent areas (few exotics and shrubs). Also has 100+ rattlesnake master and white wild indigo plants. Other species include leadplant and New Jersey tea.

Table 3.10-3:
La Crescent Property Lines Route—Rare Native Plant Communities within 1 Mile of the Centerline

Community Type	Notes
Southern Seepage Meadow/Carr Class	Significant wetland complex with diverse flora. Open water pools surrounded by at least four distinct vegetation zones: mixed emergent marsh (hairy sedge, tussock sedge, sweet flag); grazed sedge meadow dominated by fowl mannagrass; narrow red alder.
Sugar Maple-Basswood (Bitternut Hickory) Forest Type	Young maple-basswood forest dominated by oak and basswood, (to 30 centimeters diameter at breast height), paper birch, American hophornbeam, and sugar maple forming > 75% canopy coverage. No evidence of disturbance. On 20–70 degree north-facing slope with scattered cliff communities on outcrops.
River bed	Sand islands in cross channel of main island, sand banks, spits, low-lying backwater areas at junction with main channels and along sloughs. Marginal meadows dominated by rice cutgrass, prairie ironweed, reed canarygrass, and Emory sedge.
Silver Maple-(Virginia Creeper) Floodplain Forest Type	Lower elevations dominated by sugar maple; typical diameter at breast height varies among stands 10-25 centimeters to 30-50 centimeters (several trees with multiple trunks); infrequent large trees to 65 centimeters diameter at breast height. Green ash rare to 54 centimeters diameter at breast height. River birch infrequent along sloughs, 40-45 centimeters.
Freshwater Mussel Concentration Area	Various locations.
Swamp White Oak Terrace Forest Type	Mature swamp white oak forest. Canopy 85–100% cover, 25–30m height, dominants: sugar maple, swamp white oak, plains cottonwood, American elm and river birch.
Calcareous Fen (Southeastern) Type	West portion with several low sedge mats with hairy sedge common, surrounded by tussock sedge-dominated vegetation. East portion dominated by prairie sedge, hairyfruit sedge. Grazed by cattle until about 1985. Recently prescribe-burned by owner. On peat >4 feet deep.
White Pine-Oak-Sugar Maple Forest Type	Eastern white pine occurs around cliffs and on lower slope. Remainder of forest with white oak, northern pin oak, bur oak, black oak, bigtooth aspen, basswood, black walnut (diseased) in canopy; sugar maple, paper birch, bitternut hickory.
Algific Talus Type	Forty to 50%canopy cover mostly yellow birch. Other notable species include alderleaf buckthorn, small enchanter's nightshade. Canadian yew, highbush cranberry, and slender cliffbrake. Occurs on lower north-northwest-facing slope above rush creek.

3.11 Impact Summary for La Crescent Property Lines Route

Table 3.11-1 presents a summary of environmental resource impacts for the La Crescent Property Lines route based on analysis of the Minnesota routing criteria.

Table 3.11-1:
Summary Impacts for La Crescent Property Lines Route

Resource Category	La Crescent Property Lines Route
Residences	
Number of Residences 0-75 feet from route centerline	0
Number of Residences 75-150 feet from route centerline	6
Number of Residences 150-300 feet from route centerline	30
Density (residences/linear mile)	0.4
Recreation and Tourism	
No impacts to recreation and tourism are expected	
Effects on Land-Based Economics	
Agriculture	
Permanent Impact	7.2 acres
Temporary Impact	542.8 acres
Forestry	No impacts to economically important forestry areas are anticipated.
Mining	No impacts to aggregate mines are anticipated.
Effects on Archaeological and Historic Resources (sites within one mile of route centerline)	
Archaeological	25 sites
Architectural	
National Register of Historic Places (NRHP)	2 sites
Architectural	70 sites
Natural Environment	
Water Resources	
Permanent Wetlands Impacts	<1 acres
Temporary Wetlands Impacts	5.0 acres
Acres of Forested Wetlands in ROW	6 acres
Stream Crossings	31
Permanent Impacts to Floodplains	330 square feet

Table 3.11-1:
Summary Impacts for La Crescent Property Lines Route

Resource Category	La Crescent Property Lines Route
Flora	
Percent Cropland	58%
Percent Grassland	21%
Percent Shrubland	<1%
Percent Forested Land	16%
Percent Aquatic	1%
Fauna	
Number of CRP Lands Crossed	87
CREP Lands Crossed	0
Length of IBAs Crossed	1
Length of GBAs Crossed	0
Number of Federal Rare and Unique Species Occurrences Within One Mile of Route Centerline	
Threatened	0
Endangered	0
Candidate	1
Special Concern	0
Number of State Rare and Unique Species Occurrences Within One Mile of Route Centerline	
Threatened	16
Endangered	2
Candidate	0
Species of Concern	21
DNR Rare Native Communities Crossed	35
Length of Outstanding Biodiversity Sites Crossed	0
Length of High Biodiversity Sites Crossed	2.8 miles
Length of Moderate Biodiversity Sites Crossed	4.5 miles
Use or Paralleling of existing ROW (transportation, pipeline, and electrical transmission systems) and property lines	
Total length of route (miles)	99.0
Length following Transmission Line (miles)	17.5
Percentage of route following Transmission Line	18%
Length following road but not Transmission Line (miles)	10.1
Percentage of route following road but not Transmission Line	10%
Length following property line but not transmission line or roads (miles)	46.2

Table 3.11-1:
Summary Impacts for La Crescent Property Lines Route

Resource Category	La Crescent Property Lines Route
Percentage of route following property line but not transmission line or roads	47%
Total length following transmission line, roads, or property lines (miles)	73.8
Percentage of route following transmission line, roads or property lines	75%
Length not following transmission line, roads or property lines (miles)	25.1
Percentage of route not following transmission line, roads or property lines	25%

4.0 Winona Route

The Winona route between the North Rochester Substation and the Winona Crossing is approximately 77 miles long and parallels existing linear corridors (transmission line and roads) and property lines for approximately 59 miles. Table 4.0-1, below, shows the length and percentage of existing linear features that the Winona route follows. The Winona route is shown on Figure 1.0-1.

Table 4.0-1:
Winona Route - Length Paralleling Existing Linear Features

Total length of route	76.6 miles
Percent (length) following existing transmission line	8% (5.8 miles)
Percent (length) following road or rail but not transmission line	4% (3.4 miles)
Percent (length) following property line but not transmission line, roads or rail	55% (42.4 miles)
Percent (length) not following existing linear feature	33% (25.0 miles)

Between the North Rochester Substation Siting Area and the vicinity of the Chester Substation, the Winona route follows the same route as the La Crescent Property Lines and La Crescent I-90 routes, a distance of approximately 30 miles. A detailed description of this route segment can be found in Section 2.1.

Between the vicinity of the Chester Substation and the Lewiston area, the Winona Route follows the same route as the La Crescent Property Lines Route: continuing east from the vicinity of the Chester Substation, primarily following property lines for approximately 17.3 miles. From this point, near Winona County Highway 39 and County Road 119, the route jogs south and east, crossing US 14 approximately

one mile west of Utica. The route continues east 2.5 miles to Cemetery Road / Township Road 13. From this point the route diverges from the La Crescent Property Lines Route, turns north for 0.25 mile then turns east for approximately 9 miles to MN 43. The route then runs east and north approximately 7 miles through the hills south of Winona. The route crosses US 61 approximately 1.25 miles east of MN 43. The route then enters an industrial park near the Mississippi River and follows the existing Xcel Energy 69 kV line across the river to Wisconsin. Of the final 22 miles of the route, from near Utica to the Mississippi River, less than one-third of the route follows a property line or other existing corridor.

The following sections provide a description of the existing environment and potential impacts associated with the Winona Route.

4.1 Land Cover and Land Use

Land cover types identified along the route include cropland, grassland, shrubland, forest, aquatic, marshland, and urban. Table 4.1-1 shows the percent of land cover within the route. Land cover along the route is shown on Figure 2.3-1.

Table 4.1-1:
Winona Route—Land Cover Summary within Route

Land Use Type	Percent of Route[1]
Cropland	66%
Grassland	21%
Shrubland (total)	<1%
Lowland Shrub	<1%
Upland Shrub	<1%
Forest (total)	11%
Bur/White Oak	<1%
Cottonwood	0%
Maple/Basswood	<1%
All Others	10%
Aquatic (total)	1%
Open water	<1%
Marshland	<1%
Urban (total)	1%
High Intensity Urban	<1%
Low Intensity Urban	<1%
Transportation	<1%
Total	100

Source: MNDNR (2002)

[1] All percentages rounded to the nearest whole number.

4.2 Displacements

Table 4.2-1 lists the number of residences identified within 300 feet of the Winona route. The Applicant did not identify any residences, businesses, or other structures within 75 feet of the Winona route centerline. Therefore, no displacements are anticipated along the Winona route.

Table 4.2-1:
Residences within 300 feet of the Winona Route Centerline

Proximity (feet)	Winona
0–75 (Potential Displacements)[1]	0
75–150	5
150–300	20
Density[2] (residences/linear mile)	0.3

1 The ROW required is 150 feet, or 75 feet on either side of the centerline.

2 Density is rounded to the nearest whole number.

4.3 Recreation and Tourism

Most of the land surrounding the Winona route is private and does not provide for public recreation opportunities. Recreational resources in proximity to the Winona route are identified on Figure 2.5-1. The Winona route crosses multiple snowmobile trails, but because snowmobile trails are often relocated each winter, it is not possible to determine the exact number of crossings or the exact distance each route would parallel snowmobile trails.

The route does not cross any WMAs, but would be within 1 mile of two WMAs, the Haverhill and Eastside WMAs. The route crosses approximately 5 miles of RJD Memorial Hardwood State Forest.

U.S. Highway 14 also is known as the Great River Road National Scenic Byway, a national scenic byway located along the Mississippi River through Winona. The Winona route crosses the scenic byway once southeast of Winona.

4.4 Transportation

The Winona route parallels several different types of roadways, U.S. Highways, state highways, county roads, and local roads. Table 4.4-1 shows the length the route parallels each type of roadway. Transportation infrastructure is identified on Figure 2.6-1.

Table 4.4-1:
Winona Route—Roads Paralleled

Roadway	Distance Paralleled
Interstate Highway	0.0
U.S. Highway	1.8
State Highways	0.6
County Roads	18.4
Local Roads	0.2

Source: MNDOT 2007.

4.5 Land Based Economies

The route would permanently impact approximately 6.2 acres of agricultural land, and would temporarily impact approximately 424 acres of agricultural land. Approximately 1,027 acres of prime farmland, prime farmland if drained, and farmland of statewide importance would be located in the ROW. Agricultural land cover is identified on Figure 2.3-1 and Prime Farmland is identified on Figure 2.7-1.

There is one aggregate mine located within the Winona route. Mining resources are identified on Figure 2.7-2. There would be no direct impacts to existing mining operations within the La Crescent I-90 route. If mining operations cannot be avoided, the Applicant would work with existing mine operators to identify the extent of current and planned mining operations and develop appropriate mitigation measures.

No townships within the Winona Route have AHPs for 2010, so the route would not impact any economically viable forestry resources. Total forested land cover crossed by the route is identified in Table 4.1-1. Impacts to forested areas would include tree clearing within the ROW or in construction staging areas.

4.6 Archaeological and Architectural

There are 59 archaeological sites documented within 1 mile of the Winona route centerline. There are three NRHP-listed sites within 1 mile from the route centerline; the Cameron Daniel House in La Crescent, the Oronoco School, and the Ellsworth Benjamin House in Utica. There are nine architectural sites within 1 mile of the Winona route centerline. NRHP-listed sites are identified on Figure 2.8-1.

4.7 Water Resources

All streams crossed by the Winona route are listed in Table 4.7-1. The route crosses 26 streams, 9 of which are PWI streams under the regulatory jurisdiction of MDNR (MDNR 2003). Streams are identified on Figure 2.9-1.

Table 4.7-1:
Winona Route—Stream Crossings

Waterbody Name	Number of Crossings	PWI Stream (Yes/No)
Unnamed Tributary to Zumbro River, Middle Fork	10	No
Unnamed Tributary to Dry Run Creek	5	No
Unnamed Tributary to Zumbro River	9	No
Zumbro River	1	Yes
Unnamed Tributary to Silver Spring Creek	7	No
Unnamed Tributary to Whitewater River, North Branch	4	No
Unnamed Tributary to Silver Creek	1	No
Silver Creek	1	Yes
Unnamed Tributary to Bear Creek	13	No
Unnamed Tributary to Trib 6, Middle Branch	8	No
Trib 6, Middle Branch	2	Yes
Whitwater River, Middle Branch	1	Yes
Unnamed Tributary to Whitewater River, Middle Branch	1	Yes
Unnamed Tributary to Whitewater River, Middle Branch	5	No
Unnamed Tributary to Whitewater River, South Branch	8	No
Whitewater River, South Branch	1	Yes
Unnamed Tributary to Rush Creek	8	No
Unnamed Tributary to Garvin Brook	2	No
Unnamed Tributary to Stockton Valley Creek	17	No
Unnamed Tributary to Stockton Valley Creek	2	Yes
Unnamed Tributary to Burns Valley Creek, East	2	No
Burns Valley Creek, East	1	No
Unnamed Tributary to Pleasant Valley Creek	3	No
Pleasant Valley Creek	5	Yes
Gilmore Creek	1	No
Mississippi River	1	Yes

Source: MNDNR (2003).

Six surface waters crossed by the route are designated as impaired waters by the MPCA (2009):

- Stockton Valley Creek—turbidity
- Whitewater River, Middle Fork—turbidity
- Whitewater River, South Fork—turbidity
- Lake Zumbro—turbidity
- Mississippi River—PCBs
- Silver Creek—turbidity

A summary of wetlands crossed by the 150-foot ROW of the Winona route is shown in Table 4.7-2. Wetlands are shown on Figure 2.9-1. The 150-foot ROW route crosses NWI wetlands in 37 different locations, including 7 locations mapped as MDNR PWI wetlands. The total area of NWI wetlands within the 150-foot ROW of the route is approximately 30.6 acres, or 2.2 percent of the total ROW acreage. Less than 1 acre of permanent impacts to wetlands is anticipated and 4.0 acres of temporary impacts to wetlands are anticipated along the Winona route. Existing trees would be removed throughout the entire 150-foot ROW in forested wetlands during construction of the transmission line. Approximately 4 acres of forested wetlands would need to be cleared.

The Winona route crosses 15 FEMA floodplains, shown on Figure 2.9-1. The total area of floodplains within the 150-foot ROW is approximately 1,391 acres. Two of the floodplains crossed are longer than the typical span distance of 1,000 feet. The floodplains are 8,170 feet and 1,163 feet and are associated with the Mississippi River and an unnamed tributary to Whitewater River, South Branch, respectively. This route required a total of nine structures in floodplains. The route would cause 495 square feet of permanent impacts to FEMA floodplains.

Table 4.7-2:
NWI Wetlands Crossed by 150-foot ROW of Winona Route

Wetland Type	Total NWI Wetlands			Number of MDNR PWI Wetlands Crossed
	Count	Acres in ROW	% of ROW	
NWI Total	37	30.6	2.2%	7
L1UBHh	3	6.2	.4%	2
L1UBHx	1	1.7	0.1%	1
PEM/FO1Ad	1	0.3	0.0%	0
PEM/SS1C	1	0.5	0.0%	0
PEMC	8	4.5	0.3%	0
PEMCd	2	0.9	0.1%	0
PEMCh	1	0.5	0.0%	1
PEMFh	2	1.8	0.1%	1
PFO1C	2	0.4	0.0%	0
PFO1Ch	3	3.5	0.2%	1

Table 4.7-2:
NWI Wetlands Crossed by 150-foot ROW of Winona Route

Wetland Type	Total NWI Wetlands			Number of MDNR PWI Wetlands Crossed
	Count	Acres in ROW	% of ROW	
PSS1C	2	1.9	0.1%	0
PSS1Cd	1	0.1	0.0%	0
PUB/EMFh	2	6.5	0.5%	1
PUBG	1	0.3	0.0%	0
PUBGh	5	1.5	0.1%	0
PUBGx	1	0.2	0.0%	0
R2USA	1	<0.1	0.0%	0

NWI Wetlands based on NWI data; % of ROW calculated as acreage within the ROW; Source: USFWS NWI, MDNR PWI
L1UBHh—Lacustrine, Limnetic, Unconsolidated Bottom, Permanently Flooded, Diked/Impounded wetlandsPEMC—Palustrine, Emergent, Seasonally Flooded wetlands
L1UBHx—Lacustrine, Limnetic, Unconsolidated Bottom, Permanently Flooded, Excavated
PEM/FO1Ad—Palustrine, Emergent/Forested, Broad-Leaved Deciduous, Temporarily Flooded, Partially Drained/Ditched
PEM/SS1C—Palustrine, Emergent/Scrub-Shrub, Broad-Leaved Deciduous, Seasonally Flooded
PEMC— Palustrine, Emergent, Seasonally Flooded
PEMCd—Palustrine, Emergent, Seasonally Flooded, Partially Drained/Ditched
PEMCh—Palustrine, Emergent, Seasonally Flooded, Diked/Impounded
PEMFh—Palustrine, Emergent, Semipermanently Flooded, Diked/Impounded
PFO1C—Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded
PFO1Ch— Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded, Diked/Impounded
PSS1C—Palustrine, Scrub-Shrub, Broad-Leaved Deciduous, Seasonally Flooded
PSS1Cd— Palustrine, Scrub-Shrub, Broad-Leaved Deciduous, Seasonally Flooded, Partially Drained/Ditched
PUB/EMFh—Palustrine, Unconsolidated Bottom/Emergent, Semipermanently Flooded, Diked/Impounded
PUBG—Palustrine, Unconsolidated Bottom, Intermittently Exposed
PUBGh—Palustrine, Unconsolidated Bottom, Intermittently Exposed, Diked/Impounded
PUBGx—Palustrine, Unconsolidated Bottom, Intermittently Exposed, Excavated
R2USA—Riverine, Lower Perennial, Unconsolidated Shore, Temporarily Flooded

4.8 Flora/Fauna

This route does not cross any lands within a USFWS refuge. The route does not cross any designated GBCAs. There are 56 CRP lands within the route, and four CREP lands within 1 mile of the route. Two WMAs are located within 1 mile of the route centerline. No SNAs are located within 1 mile of the route centerline. The Winona route crosses five state-designated trout streams. This route does not cross any designated IBAs. The route crosses 5.2 acres of private lands within the RJD Memorial Hardwood State Forest. Figure 2.10-1 shows conservation lands and designated wildlife areas in the Project area near the Winona route.

4.9 Rare and Unique Species

Figure 2.11-1 shows areas designated as having outstanding, high, and moderate biodiversity significance. The Winona route does not cross any MCBS-designated areas of outstanding biodiversity significance. It crosses 0.2 mile of area with high biodiversity significance and 1.5 miles of area with moderate biodiversity significance (Table 4.9-1).

Tables 4.9-2 and 4.9-3 present results of a search of the MNDR NHIS database for occurrence records of rare and unique species, and rare native communities within 1 mile of the Winona route centerline. There are no federally listed threatened, endangered, or candidate species within 1 mile of the route centerline. There also is one DNR Railroad ROW Prairie site within 1 mile of the route's centerline.

Table 4.9-1:
MCBS Biodiversity Sites Crossed by Route

Site Name	Location	Length of Crossing (mi)	Biodiversity Significance	Description of Site	Associated Rare and Unique Resources
Oronoco 12	Immediately east of Zumbro Lake	0.96	Moderate	Red Oak-White Oak Forest	None
Lawler's Prairie	Immediately north of where line crosses Collegeview Road East	0.01	Moderate	Dry Bedrock Bluff Prairie	1 state special concern plant species
Pleasant Valley	Immediately east of where route crosses CR 17	0.43	Moderate	Dry Bedrock Bluff Prairie/Red Oak-White Oak Forest	1 state special concern plant species; 1 state threatened reptile species
Pleasant Ridge	Immediately south of where route crosses CR 15	0.22	High	Dry Bedrock Bluff Prairie/Red Oak-White Oak Forest/Southern Dry Cliff	1 state threatened reptile species

Table 4.9-2:
Winona Crossing Route—Rare and Unique Species

Common Name	Scientific Name	Status
Wildlife Species		
Amphibians		
Pickerel frog	*Rana palustris*	Non-listed
Birds		
Acadian Flycatcher	*Empidonax virescens*	SC
Bald Eagle	*Haliaeetus leucocephalus*	SC
Cerulean Warbler	*Dendroica cerulea*	SC
Hooded Warbler	*Wilsonia citrina*	SC
Loggerhead Shrike	*Lanius ludovicianus*	ST
Wilson's Phalarope	*Phalaropus tricolor*	ST
Fish		
American brook lamprey	*Lampetra appendix*	
Blue sucker	*Cycleptus elongatus*	SC
Crystal darter	*Ammocrypta asprella*	SC
Paddlefish	*Polyodon spathula*	ST
Pugnose minnow	*Opsopoeodus emiliae*	Non-listed
Yellow bass	*Morone mississippiensis*	SC
Mollusks		
Black sandshell	*Ligumia recta*	SC
Creek heelsplitter	*Lasmigona compressa*	SC
Elephant-ear	*Elliptio crassidens*	SE
Elktoe	*Alasmidonta marginata*	ST
Ellipse	*Venustaconcha ellipsiformis*	ST
Fluted-shell	*Lasmigona costata*	SC
Hickorynut	*Obovaria olivaria*	SC
Monkeyface	*Quadrula metanerva*	ST
Mucket	*Actinonaias ligamentina*	ST
Round pigtoe	*Pleurobema coccineum*	ST
Spike	*Elliptio dilatata*	SC

Table 4.9-2:
Winona Crossing Route—Rare and Unique Species

Common Name	Scientific Name	Status
Wartyback	*Quadrula nodulata*	SE
Washboard	*Megalonaias nervosa*	ST
Reptiles		
Blanding's turtle	*Emydoidea blandingii*	ST
Timber rattlesnake	*Crotalus horridus*	ST
Vegetation Species		
Herbaceous Plants		
Cliff goldenrod	*Solidago sciaphila*	SC
Glade mallow	*Napaea dioica*	ST
Green dragon	*Arisaema dracontium*	Non-listed
Jewelled shooting star	*Dodecatheon amethystinum*	Non-listed
Lance-leaved violet	*Viola lanceolata*	ST
Rattlesnake-master	*Eryngium yuccifolium*	SC
Snow trillium	*Trillium nivale*	SC
Tuberous Indian-plantain	*Arnoglossum plantagineum*	ST
Upland boneset	*Eupatorium sessilifolium*	ST
White wild indigo	*Baptisia alba*	SC

Source: MNDR (2007).

SC State Species of Concern SE State Endangered ST State threatened

Table 4.9-3:
Winona Crossing Route—Rare Native Plant Communities within 1-Mile of the Centerline

Community Type	Notes
Mesic Prairie (Southern) Type	Narrow, 1.5-mile-long strip of disturbed prairie along railroad grade. Dominated by bluegrass and, in patches, smooth brome. About 50% cover by trees and shrubs, with aspen common. Noted 17 native prairie species during brief search.
Mesic Prairie (Southern) Type	Dominated by big bluestem. Other graminoids: little bluestem, switchgrass, and Indian grass. Moderate diversity of forbs, including horsemint, coneflower, gayfeather, false boneset, and closed bottle gentian.
Mesic Prairie (Southern) Type	Mesic prairie dominated by big bluestem and prairie cordgrass. Seems more intact than adjacent areas (few exotics and shrubs). Also have 100+ rattlesnake master and white wild indigo plants. Other species include leadplant, New Jersey tea.
Dry Bedrock Bluff Prairie (Southern) Type	Bluff prairie on small outcrops on southwest-facing slope at top of Zumbro River valley. Parts overgrown with Eastern red cedar, smooth sumac, and aspen, but still have prairie. Open areas dominated by sideoats grama, prairie dropseed, muhly, and little bluestem.
Dry Bedrock Bluff Prairie (Southern) Type	Fifteen prairies on south to west-facing steep slopes surrounded by contiguous matrix of disturbed oak forest. Prairies look open, relatively good quality in drive-by survey. Needs inventory. Winona, east of east Burns Valley, west of Pleasant Valley.
Dry Bedrock Bluff Prairie (Southern) Type	Large prairie with relatively low species richness. Common species include big bluestem, little bluestem, sideoats grama, leadplant. Exotics common.
Dry Bedrock Bluff Prairie (Southern) Type	Single prairie dominated by Indian grass, big bluestem, sideoats grama, prairie dropseed. Eroded sandy draws with fringed sage.
Sugar Maple-Basswood(Bitternut Hickory) Forest	Young maple-basswood forest dominated by red oak, basswood (to 30 cm diameter at breast height), paper birch, sugar maple > 75% canopy coverage. No evidence of disturbance. On 20–70 degree north-facing slope with scattered cliff communities on outcrops.
Native Plant Community, Undetermined Class	Slope located 0.75 mile upstream along Gavin Creek from south end of farmers community park. A small, unspectacular slope with no significant plant species observed.
Native Plant Community, Undetermined Class	Mesic oak with much of stand dominated by large trees. Ground layer somewhat depauperate, though not weedy. Past grazing light to moderate. Gently-rolling ridgetop and steep north-facing slopes above Garvin Brook and Chicago-Northwest Railroad.
Native Plant Community, Undetermined Class	Old forest dominated by red oak and bur oak; average diameter at breast height 30–35 cm. Cored one red oak at 43 cm diameter at breast height: 107 rings. Frequent snags; gaps with saplings of red oak, basswood, and sugar maple and heavy shrub cover. Canopy cover to 90%; average 60%.
Native Plant Community, Undetermined Class	Large meadow dominated mostly by hairy sedge and bluejoint reedgrass with areas dominated by tussock sedge or cattails. Moderate species diversity.
Native Plant Community, Undetermined Class	Moderately mature dry-mesic forest dominated by red oak and white oak with chokecherry, and basswood. Interrupted subcanopy includes much sugar maple. Patchy shrub layer.

Source: MNDNR (2007).

4.10 Impacts Summary for Winona Route

Table 4.10-1 presents a summary of environmental resource impacts for the Winona route based on analysis of the Minnesota routing criteria.

Table 4.10-1:
Summary of Impacts for Winona Route

Resource Category	Winona Route
Recreation and Tourism	
RJD State Forest crossed	5.0 miles
Great River Road National Scenic Byway	1 crossing
Effects on Land-Based Economics	
Agriculture	
Permanent Impact	6.2 acres
Temporary Impact	424 acres
Forestry	No impacts to economically important forestry areas are anticipated.
Mining	No impacts to aggregate mines are anticipated.
Effects on Archaeological and Historic Resources (sites within one mile of route centerline)	
Archaeological	59
Architectural	
National Register of Historic Places (NRHP)	3
Architectural	9
Natural Environment	
Water Resources	
Permanent Wetlands Impacts	<1 acre
Temporary Wetlands Impacts	4 acres
Acres of Forested Wetlands in ROW	4.0 acres
Stream Crossings	26
Permanent Impacts to Floodplains	495 square feet
Flora	
Percent Cropland	66%
Percent Grassland	21%
Percent Shrubland	<1%
Percent Forested Land	11%
Percent Aquatic	1%

Table 4.10-1:
Summary of Impacts for Winona Route

Resource Category	Winona Route
Fauna	
Number of CRP Lands Crossed	56
CREP Lands Crossed	0
Length of IBAs Crossed	0
Length of GBAs Crossed	0
Number of Federal Rare and Unique Species Occurrences Within One Mile of Route Centerline	
Threatened	0
Endangered	0
Candidate	0
Special Concern	0
Number of State Rare and Unique Species Occurrences Within One Mile of Route Centerline	
Threatened	15
Endangered	2
Candidate	0
Species of Concern	16
DNR Rare Native Communities Crossed	13
Length of Outstanding Biodiversity Sites Crossed	0
Length of High Biodiversity Sites Crossed	.2 mile
Length of Moderate Biodiversity Sites Crossed	1.5 miles
Use or Paralleling of existing ROW (transportation, pipeline, and electrical transmission systems) and property lines	
Total length of route	76.5
Length following Transmission Line	5.8
Percentage	8%
Length following road but not Transmission Line	3.4
Percentage	4%
Length following property line but not transmission line or roads	42.4
Percentage	55%
Total length following transmission line, roads, and property lines	51.6
Percentage	67%
Length following nothing	25.0
Percentage	33%

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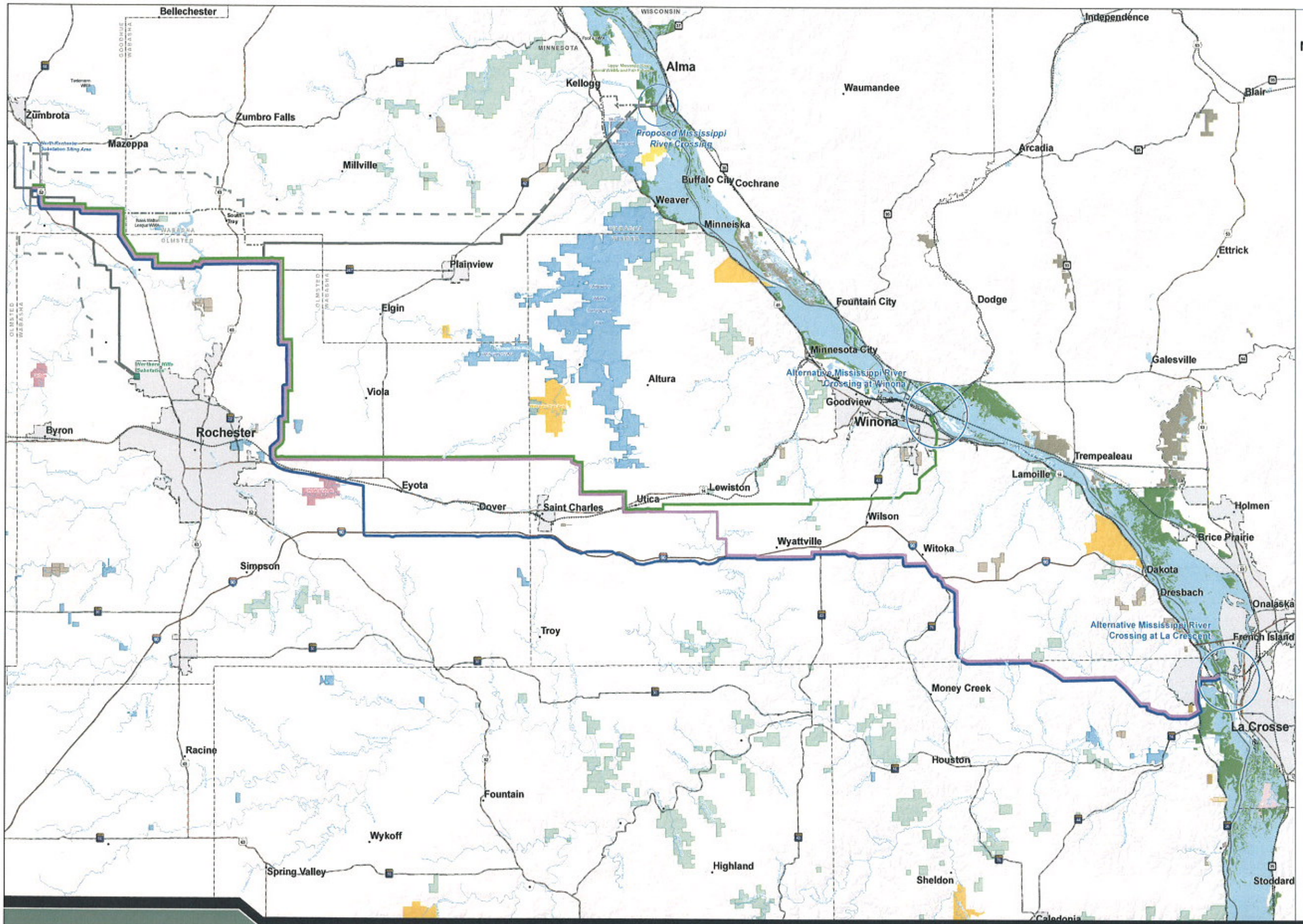

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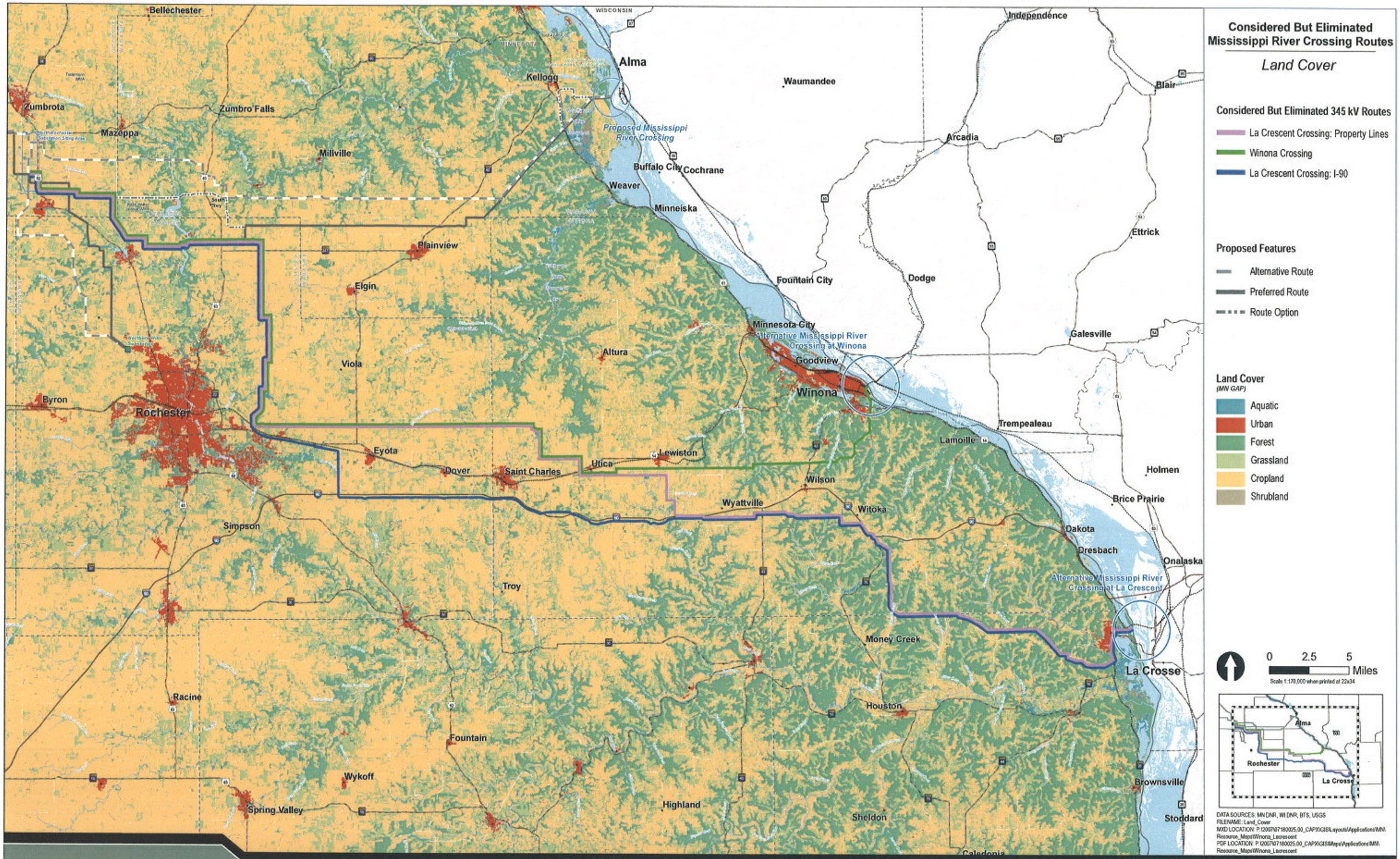
Appendix K - Jurisdiction
MN Route Permit Application

1.0-1: Overview/Jurisdiction



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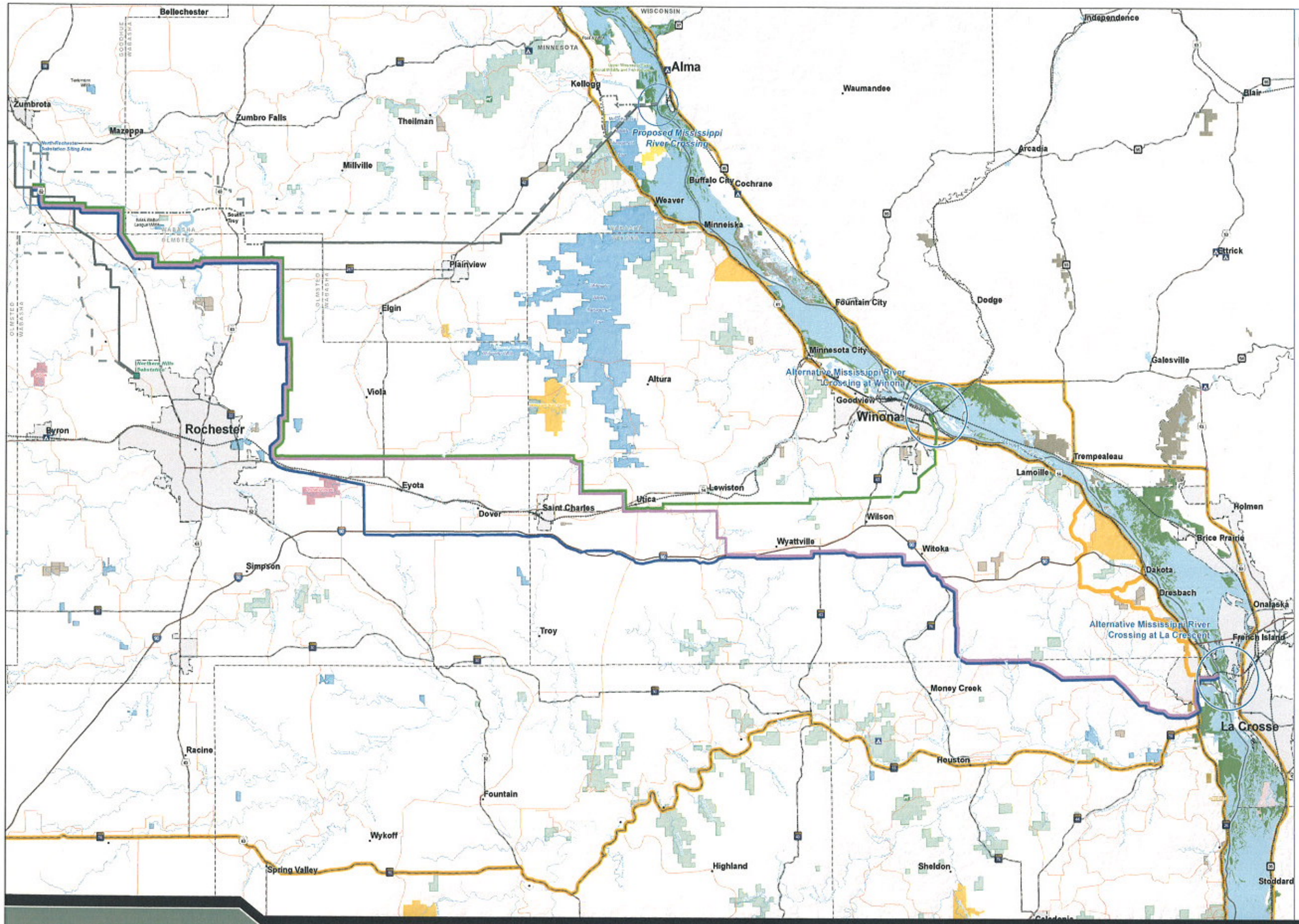
Appendix K - Land Cover
MN Route Permit Application

2.3-1: Land Cover



Considered But Eliminated Mississippi River Crossing Routes

Recreation

Considered But Eliminated 345 kV Routes

- La Crescent Crossing: Property Lines
- Winona Crossing
- La Crescent Crossing: I-90

Proposed Features

- Alternative Route
- Preferred Route
- Route Option

Recreation Area
(MNDNR, USGS, NPS, TNC, Census 2000)

- Public Boat Ramp
- Public Campground
- Private Campground
- Ski Area
- Horse Campground
- Wildlife Management Area
- Minnesota Land Trust
- Minnesota State Park
- U.S. Fish and Wildlife Service
- County/County Park

Trails
(MN DNR and WI DNR)

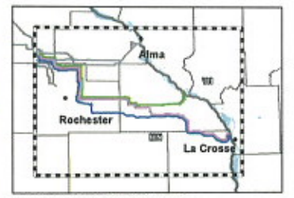
- Snowmobile Trail

Scenic Byways
(Census/Digitized EDAW)

- Scenic Byway

0 2.5 5 Miles

Scale 1:170,000 when printed at 22x34



DATA SOURCES: MN DNR, WI DNR, BTS, USGS
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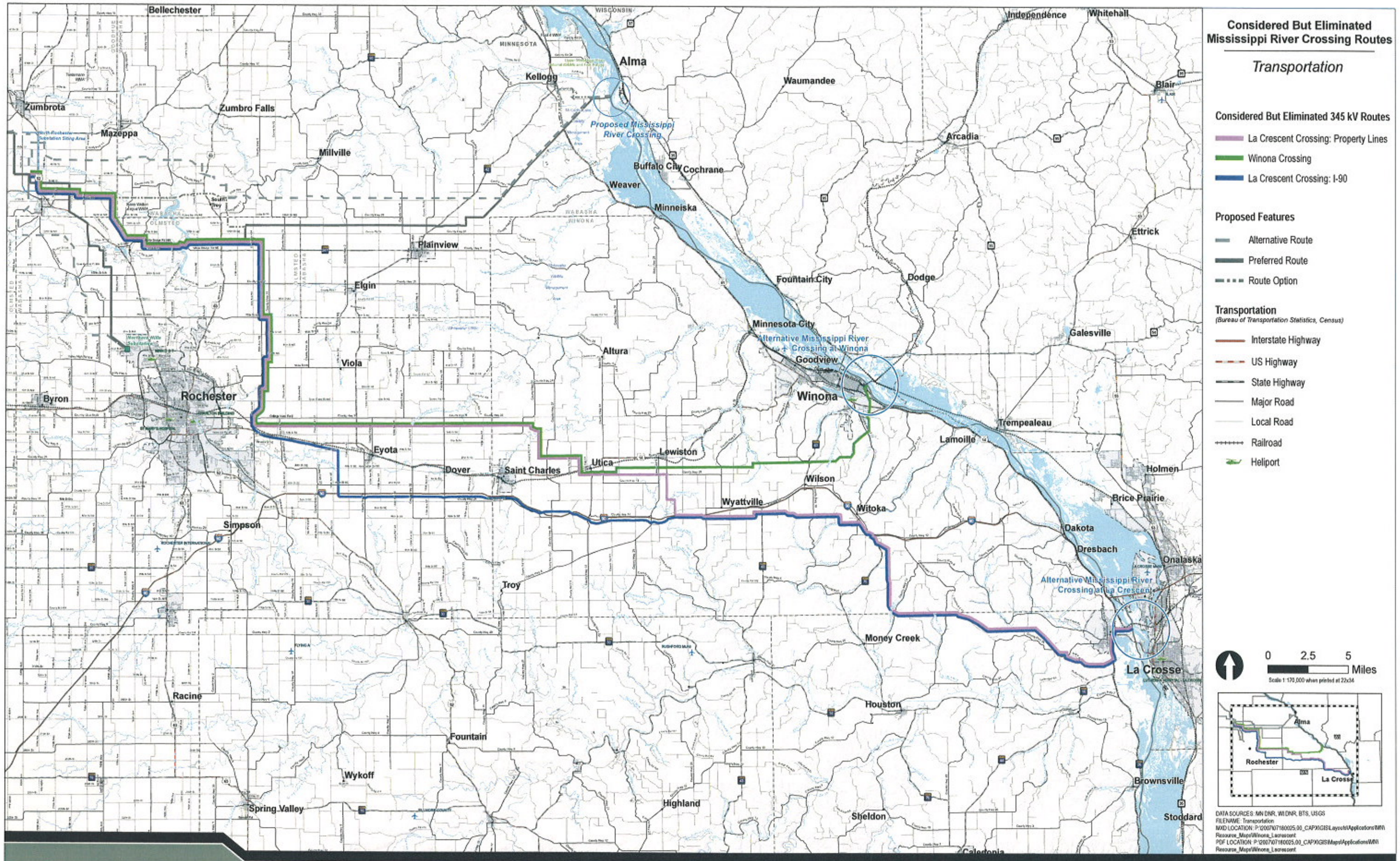
Appendix K - Recreation
MN Route Permit Application


Considered But Eliminated Mississippi River Crossing Routes
Transportation
Considered But Eliminated 345 kV Routes
La Crescent Crossing: Property Lines
Winona Crossing
La Crescent Crossing: I-90
Proposed Features
Alternative Route
Preferred Route
Route Option
Transportation
(Bureau of Transportation Statistics, Census)
Interstate Highway
US Highway
State Highway
Major Road
Local Road
Railroad
Heliport
Proposed Mississippi River Crossing
Alternative Mississippi River Crossing at Winona
Alternative Mississippi River Crossing at La Crescent
Bellechester
Zumbrota
Zumbro Falls
Mazeppa
Millville
Kellogg
Alma
Buffalo City
Cochrane
Weaver
Minneiska
Waumandee
Independence
Whitehall
Blair
Arcadia
Ettrick
Plainview
Elgin
Viola
Altura
Fountain City
Dodge
Minnesota City
Goodview
Winona
Galesville
Trempealeau
Lamoille
Holmen
Brice Prairie
Onalaska
Dakota
Dresbach
Byron
Rochester
Eyota
Dover
Saint Charles
Utica
Lewiston
Wilson
Wyattville
Witoka
Simpson
Troy
Money Creek
Houston
La Crosse
Racine
Fountain
Wykoff
Spring Valley
Highland
Sheldon
Brownsville
Stoddard
Caledonia
0 2.5 5 Miles
Scale 1:170,000 when printed at 22x34
DATA SOURCES: MN DNR, WI DNR, BTS, USGS
FILENAME: Transportation
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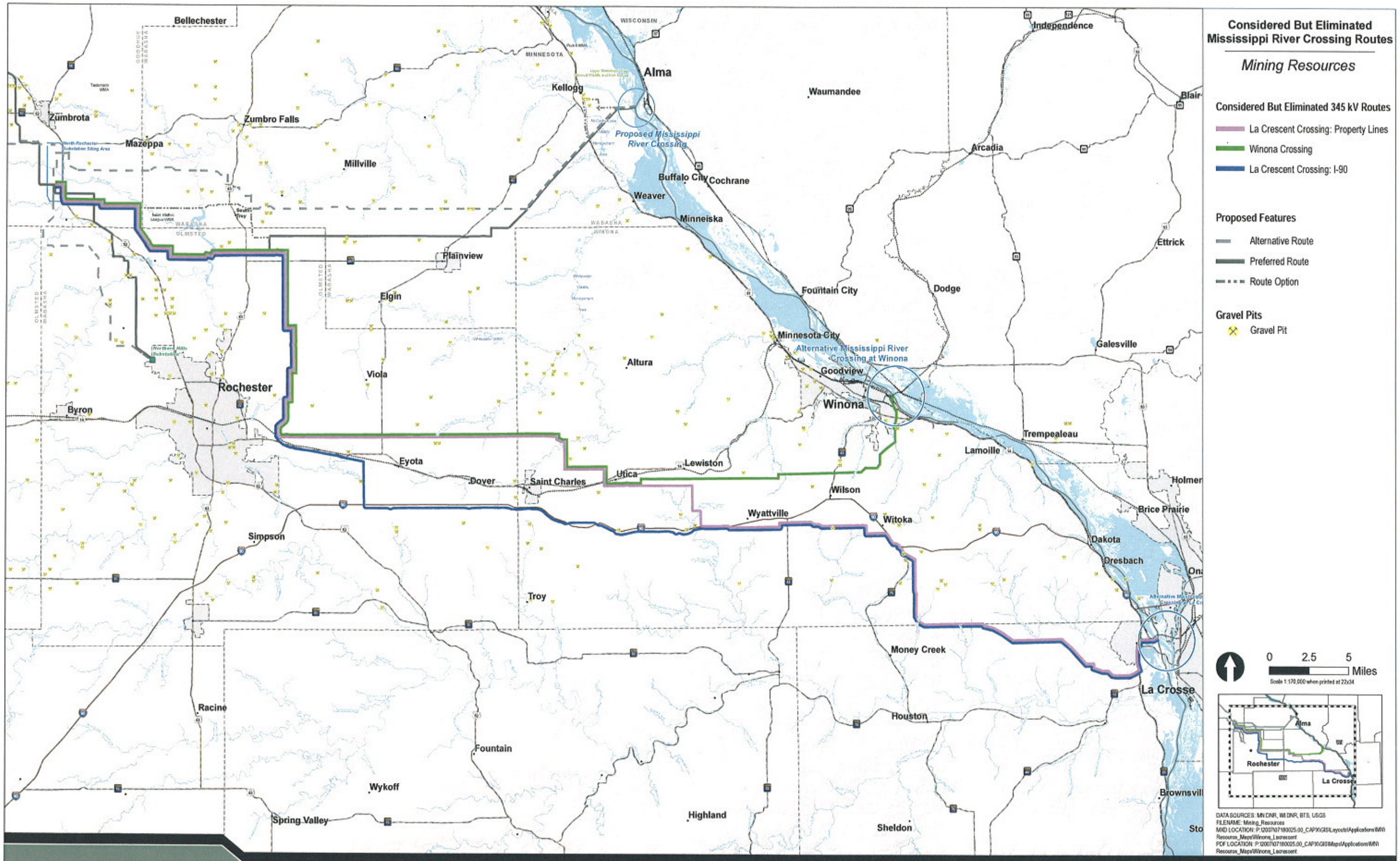
Appendix K - Prime Farmland
MN Route Permit Application

2.7-1: Prime Farmland


Considered But Eliminated Mississippi River Crossing Routes
Mining Resources
Considered But Eliminated 345 kV Routes
La Crescent Crossing: Property Lines
Winona Crossing
La Crescent Crossing: I-90
Proposed Features
Alternative Route
Preferred Route
Route Option
Gravel Pits
Gravel Pit
Proposed Mississippi River Crossing
Alternative Mississippi River Crossing at Winona
Bellechester
Zumbrota
Zumbro Falls
Mazeppa
Millville
Alma
Kellogg
Waumandee
Independence
Blair
Arcadia
Buffalo City
Cochrane
Weaver
Minneiska
Ettrick
Plainview
Elgin
Fountain City
Dodge
Minnesota City
Galesville
Altura
Viola
Goodview
Winona
Rochester
Byron
Trempealeau
Lamoille
Eyota
Dover
Saint Charles
Utica
Lewiston
Holmen
Wilson
Brice Prairie
Wyattville
Witoka
Simpson
Dakota
Dresbach
Troy
Money Creek
La Crosse
Racine
Houston
Fountain
Wykoff
Spring Valley
Highland
Sheldon
0 2.5 5 Miles
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DATA SOURCES: MN DNR, WI DNR, BTS, USGS
FILENAME: Mining_Resources
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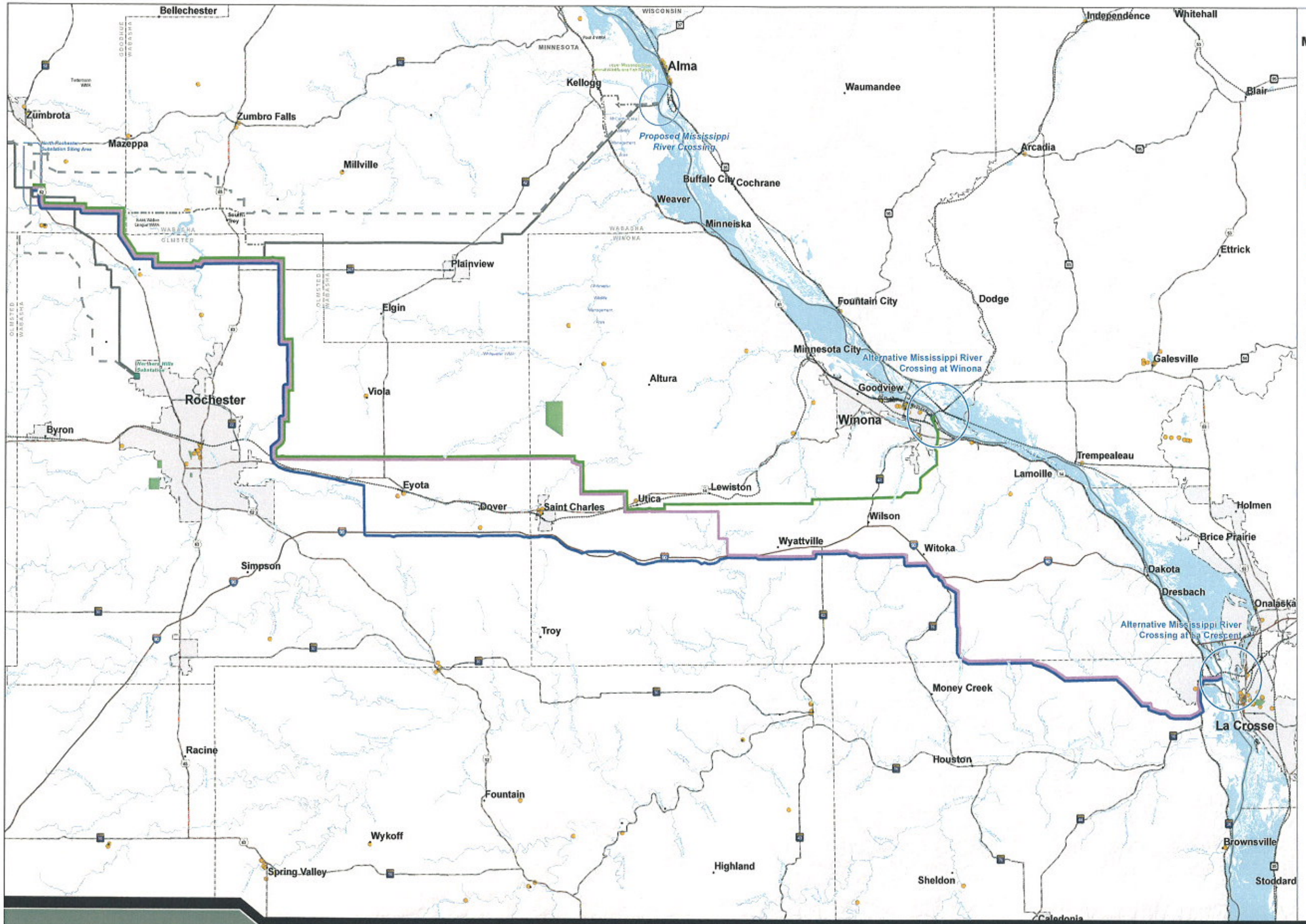

Considered But Eliminated Mississippi River Crossing Routes

Historic Sites

Considered But Eliminated 345 kV Routes

- La Crescent Crossing: Property Lines
- Winona Crossing
- La Crescent Crossing: I-90

Proposed Features

- Alternative Route
- Preferred Route
- Route Option

Historic Places
(National Register of Historic Places)

- Historic Place
- Historic Region

DATA SOURCES: MN DNR, WI DNR, BTS, USGS
FILENAME: Historic_Sites
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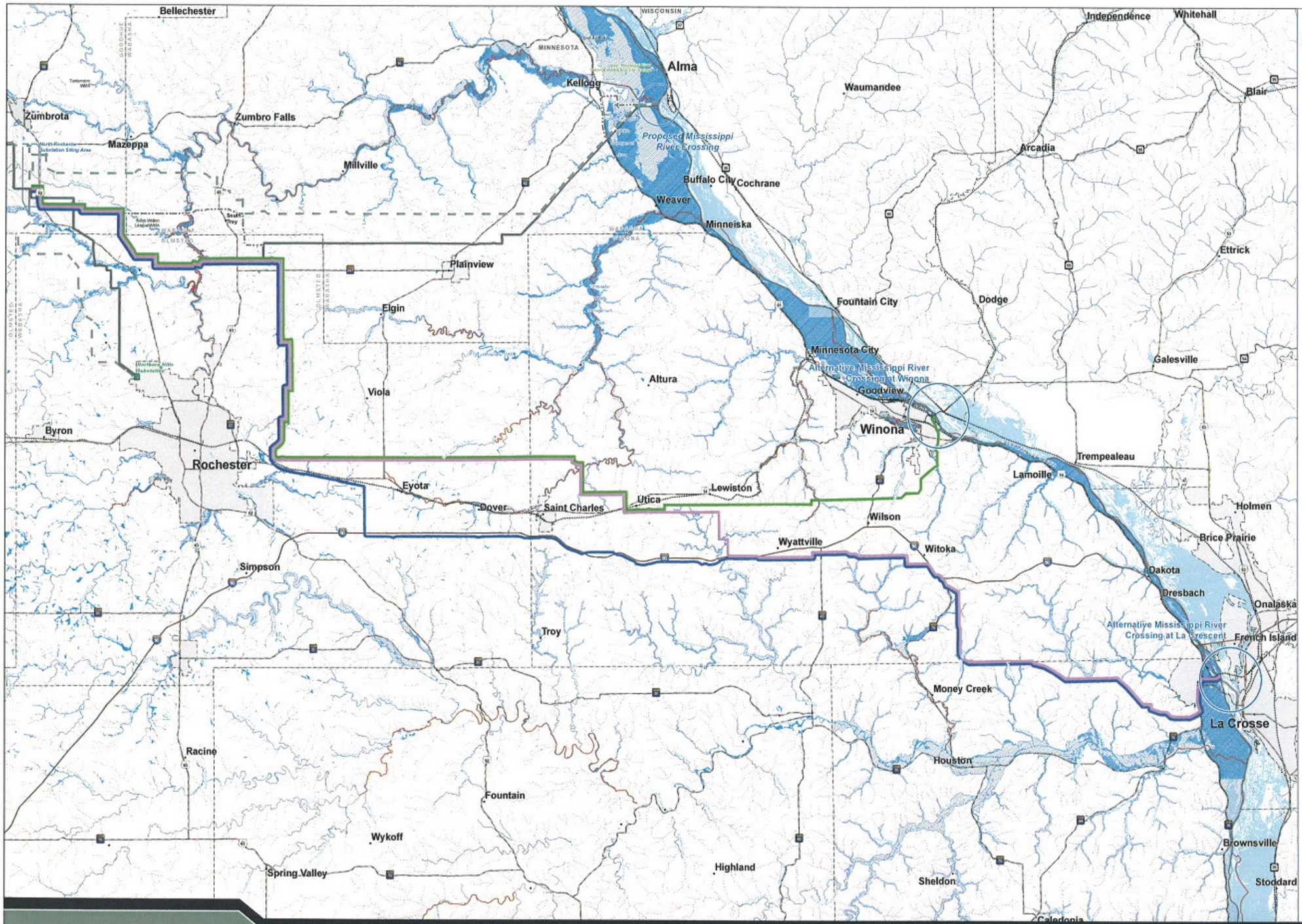
Appendix K - Historic Sites
MN Route Permit Application

2.8-1: Historic Sites



Considered But Eliminated Mississippi River Crossing Routes

Water Resources

Considered But Eliminated 345 kV Routes

- La Crescent Crossing: Property Lines
- Winona Crossing
- La Crescent Crossing: I-90

Proposed Features

- Alternative Route
- Preferred Route
- Route Option

Surface Water
(MNDOT, WDNR and EPA)

- Perennial Stream\Drainage Ditch
- Intermittent Stream\Drainage Ditch
- Perennial Waterbody
- Impaired Water

Wetlands
(National Wisconsin Wetland Inventories)

- Wetland

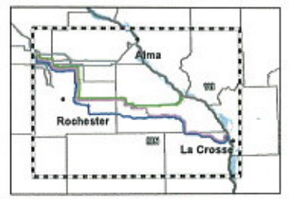
*Wetland data is incomplete for Rice and Dakota counties

Floodplains
(FEMA Q3)

- 100-Year Floodplain

0 2.5 5 Miles

Scale 1:170,000 when printed at 22x34



DATA SOURCES: MN DNR, WI DNR, BTS, USGS
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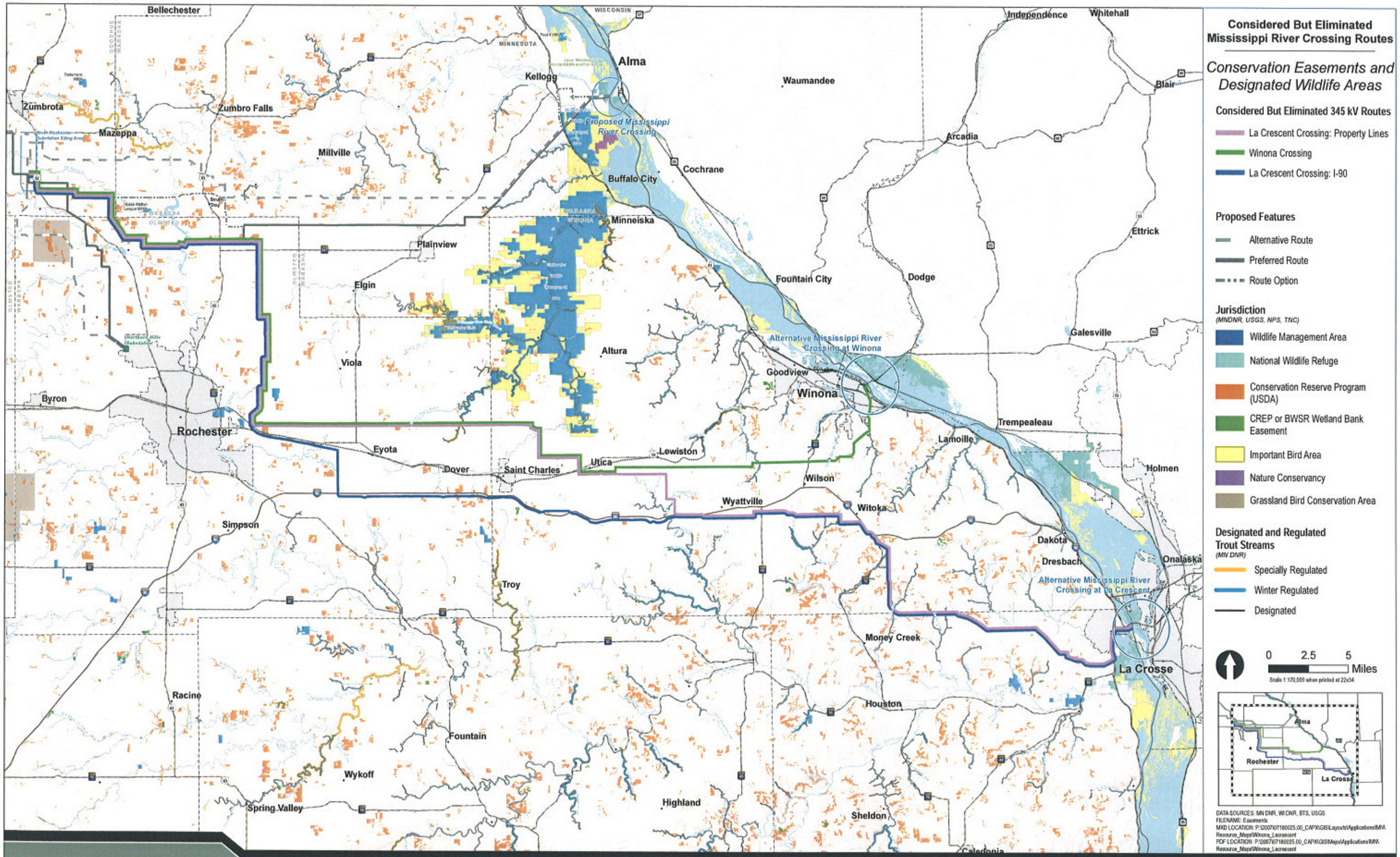

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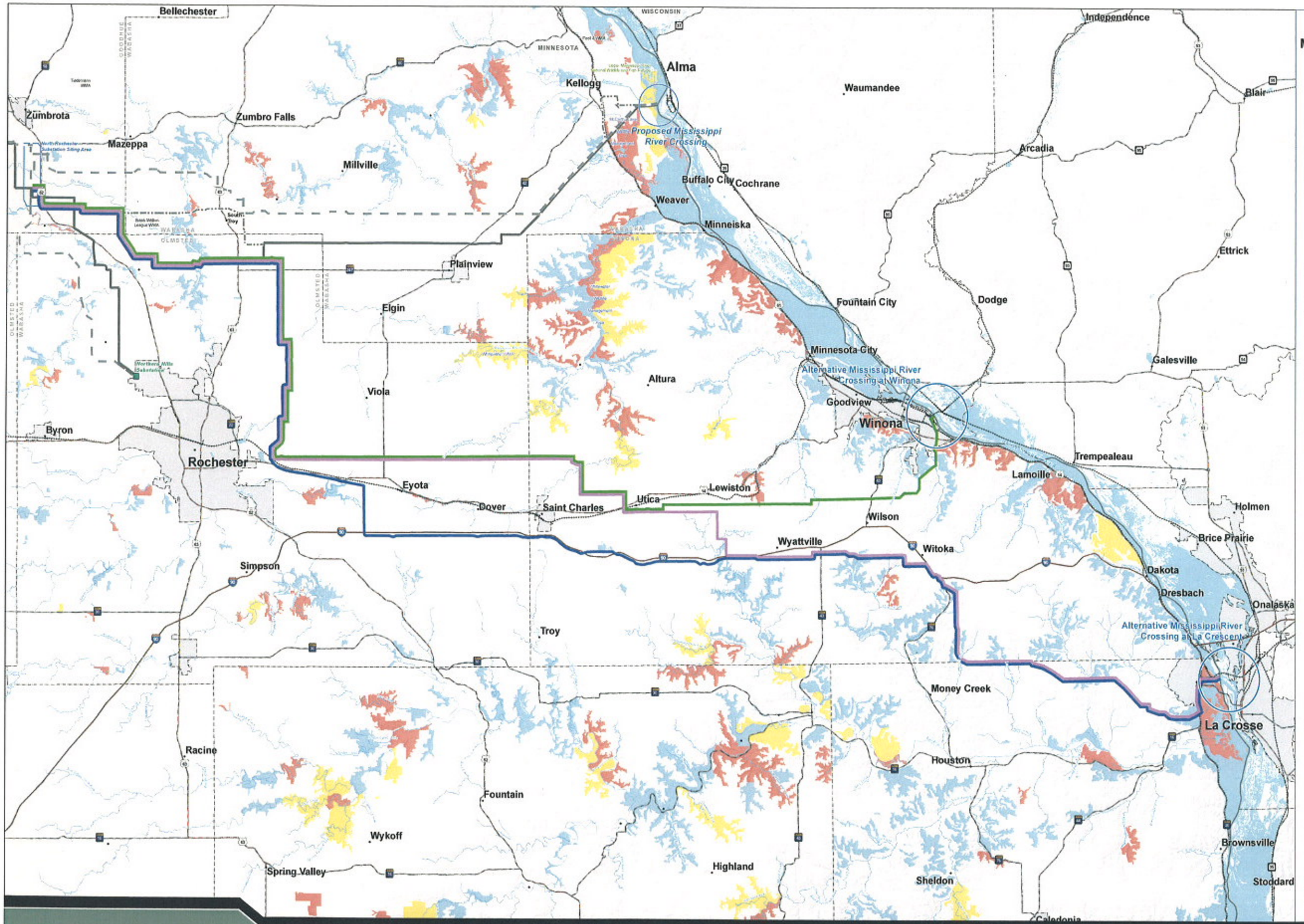
Appendix K - Conservation Easements and Designated Wildlife Areas MN Route Permit Application

2.10-1: Conservation Easements and Designated Wildlife Areas



Considered But Eliminated Mississippi River Crossing Routes

Biodiversity

Considered But Eliminated 345 kV Routes

- La Crescent Crossing: Property Lines
- Winona Crossing
- La Crescent Crossing: I-90

Proposed Features

- Alternative Route
- Preferred Route
- Route Option

Biodiversity
(MNDNR)

- Outstanding
- High
- Moderate

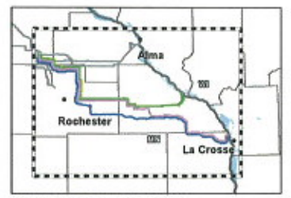
Outstanding = sites containing the best occurrences of the rarest species, the most outstanding examples of the rarest native plant communities, and/or the largest, most intact functional landscapes present in the state

High = sites containing very good quality occurrences of the rarest species, high quality examples of the rarest native plant communities, and/or important functional landscapes

Moderate = sites containing significant occurrences of rare species, and/or moderately disturbed native plant communities and landscapes that have a strong potential for recovery

0 2.5 5 Miles

Scale 1:170,000 when printed at 22x34



DATA SOURCES: MN DNR, WI DNR, BTS, USGS
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Appendix K - Biodiversity
MN Route Permit Application

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