Application for

Certificate of Public Convenience and Necessity

GARDNER PARK – CENTRAL WISCONSIN 345 kV TRANSMISSION LINE AND ASSOCIATED SWITCHING STATION AND SUBSTATION CONSTRUCTION

PSCW Docket No.

137-CE-122

MARCH 2005

AMERICAN TRANSMISSION COMPANY
THE ENERGY ACCESS COMPANY

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ASNRI	Areas of Special Natural Resource Interest
ATC	American Transmission Company LLC and American Transmission Company Management Inc., its corporate manager, known collectively as American Transmission Company
BLM	Bureau of Land Management
BMPs	Best Management Practices
CCT	Critical Clearing Time
CCVT	Coupling Capacitor Voltage Transformer
Commission	Public Service Commission of Wisconsin
CPCN	Certificate of Public Convenience and Necessity
DOT or WisDOT	Wisconsin Department of Transportation
DATCP	Wisconsin Department of Agriculture, Trade and Consumer Protection
DPC	Dairyland Power Cooperative
DTM	Digital Terrain Model
EHS	extra high strength
EIT	Environmental Inventory Tables
EMF	electromagnetic field
ESA	Environmental Site Assessments
FAA	Federal Aviation Administration
FERC	Federal Energy Regulatory Commission
ft	feet
GCMW	Gardner Park-Central Wisconsin and Morgan-Werner West
GIS	Graphical Information System
GPS	Global Positioning System
GWh	Gigawatt-hours
kA	kilo Ampere
kcmil	kilo circular mils
kV	kilovolt
Midwest ISO	Midwest Independent Transmission System Operator, Inc.
mG	milligauss
mm^2	square millimeters
MW	megawatt
MWh	megawatt-hour
MVA	megavolt amperes
NERC	North American Electric Reliability Council
OATT	open access transmission tariff
OHWM	Ordinary High Water Mark
OPGW	Optical Ground Wire

Project	Gardner Park – Central Wisconsin 345 kV Transmission Line and Associated Switching Station and Substation Construction
p.u.	per unit
RMS	root mean square
ROW	right-of-way
SCN	Soybean Cyst Nematode
SI	Site Investigations
STH	State Trunk Highway
T&E	Threatened and Endangered
TCSB	Temporary Clear Span Bridges
TSD	Technical Support Document
TSR	transmission service request
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
USH	United States Highway, US Highway
WDNR	Wisconsin Department of Natural Resources
WPSC	Wisconsin Public Service Corporation
WNHI	Wisconsin Natural Heritage Inventory
WWI	Wisconsin Wetland Inventory

Introduction and Overview

American Transmission Company LLC and ATC Management Inc., its corporate manager, known collectively as American Transmission Company or "ATC," own and operate electric transmission facilities, and transact business as a transmission company with the sole purpose of planning, constructing, operating, and maintaining transmission facilities to provide electric transmission service. ATC is obligated to provide adequate and reliable electric transmission service that meets the needs of all transmission users in the areas it serves and that supports effective competition in energy markets without favoring any market participant.

In order to meet this obligation, pursuant to sections 196.49 and 196.491 of the Wisconsin Statutes and chapters PSC 4, 111 and 112 of the Wisconsin Administrative Code, ATC hereby applies for a Certificate of Public Convenience and Necessity (CPCN) and any other authorization needed to modify existing transmission facilities and construct new transmission facilities necessary to interconnect the Weston 4 generating unit currently under construction. WIS. STAT. §§ 196.49 & 196.491 (2003); WIS. ADMIN. CODE Ch. PSC 4, 111 & 112 (2000). In Docket No. 6690-CE-187, the Commission issued a Certificate of Public Convenience and Necessity (CPCN) to Wisconsin Public Service Corporation (WPSC) authorizing WPSC to construct a nominal 500 MW electric generating facility (known as "Weston 4") to be located at the site adjacent to the existing Weston 3 generating facility in the towns of Kronenwetter and Rothschild, Wisconsin. In order for ATC to interconnect the new generating facility, and to provide transmission service to WPSC and Dairyland Power Cooperative* (DPC) for the electric energy generated by the Weston 4 facilities, ATC must construct new transmission facilities. This proposed work consists of the Gardner Park – Central Wisconsin 345 kV Transmission Line and associated switching station and substation work; these facilities are known collectively as the Gardner Park – Central Wisconsin Project or Project. The facilities proposed in this Application would be constructed in Marathon and Shawano Counties, Wisconsin.

* Dairyland Power Cooperative is currently seeking the Commission's approval to purchase a substantial portion of the Weston 4 project. Should DPC successfully purchase part of Weston 4, ATC will enter into an appropriate transmission service agreement with DPC.

A. Overview

Weston 4 will be connected to the future 345 kV bus at ATC's Gardner Park Substation being constructed on the Weston Power Plant site as part of the Arrowhead – Weston Project (approved in PSC Docket No. 5-CE-113). As detailed below, the nominal 500 MW of additional generation coming onto the transmission system at the Gardner Park Substation will cause overloads and stability problems absent transmission system reinforcement. Moreover, the addition of Weston 4 could reduce the available transfer capacity made available by the new Arrowhead – Weston 345 kV Transmission Line, thereby reducing one of the key benefits of that project. ATC has studied the alternative measures and selected the most reliable, efficient, constructible, and cost-effective solution: the Gardner Park – Central Wisconsin Project.

American Transmission Company has also conducted a comprehensive search for alternative routes and sites for the proposed Project. ATC's route and site selection process* has been open to the public, allowing all stakeholders – public officials, local organizations, homeowners and other landowners, and state agencies – free access and input into the process. ATC's comprehensive approach for gathering public and other stakeholder input and feedback – both at the outset of projects and throughout the pre-certification process – enhances ATC's ability to take into account the perspective of interested stakeholders, and to locate transmission projects that, on the whole, minimize impacts to landowners, communities, and the environment, while at the same time achieving the required electrical results in a cost-effective manner consistent with statutory requirements. This process, which began in late 2003 and continues today, has included four sets of Open Houses, held in the project study area, to both communicate to the public and to obtain public input. Thousands of interested citizens took the opportunity to learn more about the Project and to offer their comments.

American Transmission Company used this public process, along with the siting priorities set forth in section 1.12(6) of the Wisconsin Statutes, to identify the routes proposed in this Application. WIS. STAT. §1.12(6)(2003). ATC's Proposed Route takes advantage of existing utility (electric

* Because the proposed Project is contiguous with the proposed Morgan – Werner West Project, Docket No. 137-CE-123, the public outreach and routing were accomplished together to promote efficiency and effectiveness of communication.

transmission and gas pipeline) corridors, the highest statutory priority. The Proposed Switching Station Site is on ATC-owned property adjacent to an existing substation. The Alternate Route is primarily sited along a highway, State Trunk Highway (STH) 29, putting it in the second statutory priority. ATC's alternate switching station locations would be on property for which ATC has an option to purchase.

American Transmission Company has also taken steps to ensure that its proposed construction will be compatible with the human and natural environment. ATC has conducted surveys, aerially as well as on the ground, to determine the location of residences, commercial properties, and other occupied and unoccupied structures, and collected extensive information about the flora, fauna, land uses, waterways, and wetlands along all routes, and has incorporated that knowledge into its route selection process and the preliminary design of the line. In accordance with Wisconsin Statutes section 30.025(1s), ATC has contemporaneously applied to the Wisconsin Department of Natural Resources (WDNR) and the U.S. Army Corps of Engineers (USACE) for all necessary permits. WIS. STAT. §30.025(1s)(2003).

As detailed in this Application and its attachments, ATC will be able to construct the proposed Project, if approved, within the time needed to accommodate the Weston 4 generation project.

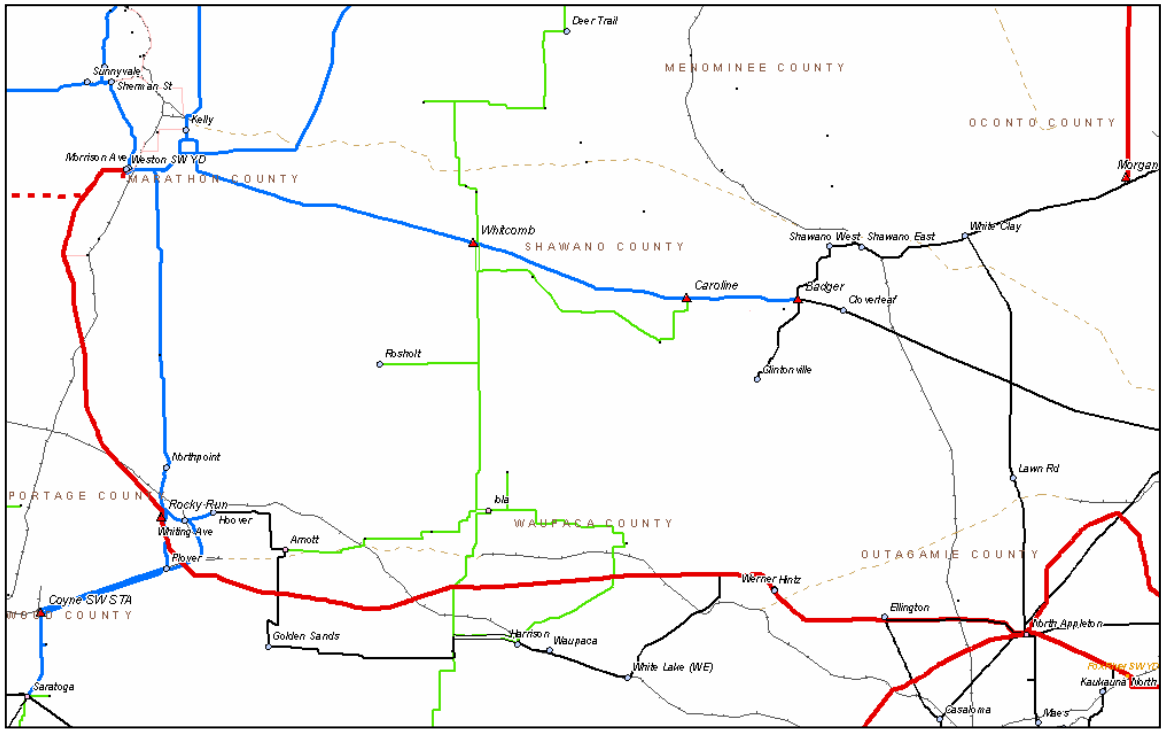
B. Purpose And Necessity

The Wausau area high voltage electric transmission system configuration presently consists of a single 345 kV transmission line and numerous 115 kV transmission lines as shown in Figure 1 below. The addition of the Weston 4 as authorized by the Commission in Docket No. 6690-CE-187, introduces significant electrical interconnection issues that must be resolved in order for that new generator to interconnect with ATC's transmission system and to provide transmission service from Weston 4.

Analyses performed by ATC indicate that the addition of Weston 4 will cause overloads and system instability resulting in unreliable transmission system operation if ATC's existing transmission system in the area is not reinforced. The analyses identify those system modifications necessary to resolve system stability concerns and overload conditions. Factors considered in evaluating system improvement alternatives to overcome these limitations included the need of the load serving entities in the Wausau and Rhinelander areas, maintaining the increased import capability associated with the

Arrowhead – Weston (Gardner Park) 345 kV Transmission Line Project, and other transmission system operating considerations. Based on the analyses, ATC determined that the most appropriate means of providing interconnection to the new generating facility, and continuing and increasing reliable transmission service, was to construct a new 345 kV transmission line from the Weston Power Plant site to the east to interconnect with ATC's proposed Morgan – Werner West 345 kV Transmission Line.

Figure 1. Existing ATC System in the Wausau Area



A new 345 kV line addresses the transmission system stability and fault duty requirements necessary to interconnect the Weston 4 facilities, as well as the thermal transmission system requirements to provide transmission service for the energy produced at Weston 4, but also:

- Ensures that the system-wide 3,000 MW import

capability target - one of the key benefits of the Arrowhead – Weston (Gardner Park) 345 kV Transmission Line - is not compromised by the installation of the new generating unit at the eastern end of that line;

- Ensures that the load serving needs in the Wausau and Rhinelander areas are met; and

- Strengthens the transmission system between north-central and northeastern Wisconsin by creating a parallel 345 kV path to most of the existing Rocky Run - North Appleton 345 kV transmission line. The Rocky Run - North Appleton 345 kV transmission line is currently the only 345 kV circuit that connects ATC's transmission systems in north-central and northeastern Wisconsin. In addition to meeting the needs of the Weston 4 generating facility, this additional 345 kV path improves the reliability of ATC's transmission system under a wider variety of multiple contingency conditions than other alternatives evaluated, thus also improving operating flexibility.

As set forth in greater detail in the Technical Support Document (TSD) and the planning analyses provided in Appendix B, ATC considered numerous alternatives to meet the stability requirements of its transmission system and energy delivery requirements of Weston 4 and achieve the additional benefits listed above. As a result of the analyses performed by ATC, ATC proposes the Gardner Park – Central Wisconsin Project as the most appropriate solution. The Project consists of:

- Constructing a new 345 kV transmission line from the Gardner Park 345 kV Substation to a new 345 kV switching station, currently referred to as "Central Wisconsin," to be located in the Shawano/Belle Plaine area, and interconnecting with the proposed Morgan – Werner West 345 kV Transmission Line;

- Constructing a new Central Wisconsin Switching Station[*] interconnecting the Gardner Park – Central Wisconsin 345 kV

[*] The new facility, as currently proposed, will not include any transformers for converting power from one voltage to another. The purpose of the station is to provide a connection point and breaker protection for two intersecting 345 kV transmission lines. It is therefore referred to here as a "switching station" to distinguish it from a typical substation in which bulk power is reduced in voltage for further transmission or distribution. Generically, the facility is an electrical service station with a ring bus and fenced area, and therefore, to

Transmission Line with the Morgan – Werner West 345 kV Transmission Line; and

- Installation of line terminal equipment at the Gardner Park Substation to accommodate the Gardner Park – Central Wisconsin 345 kV Transmission Line.

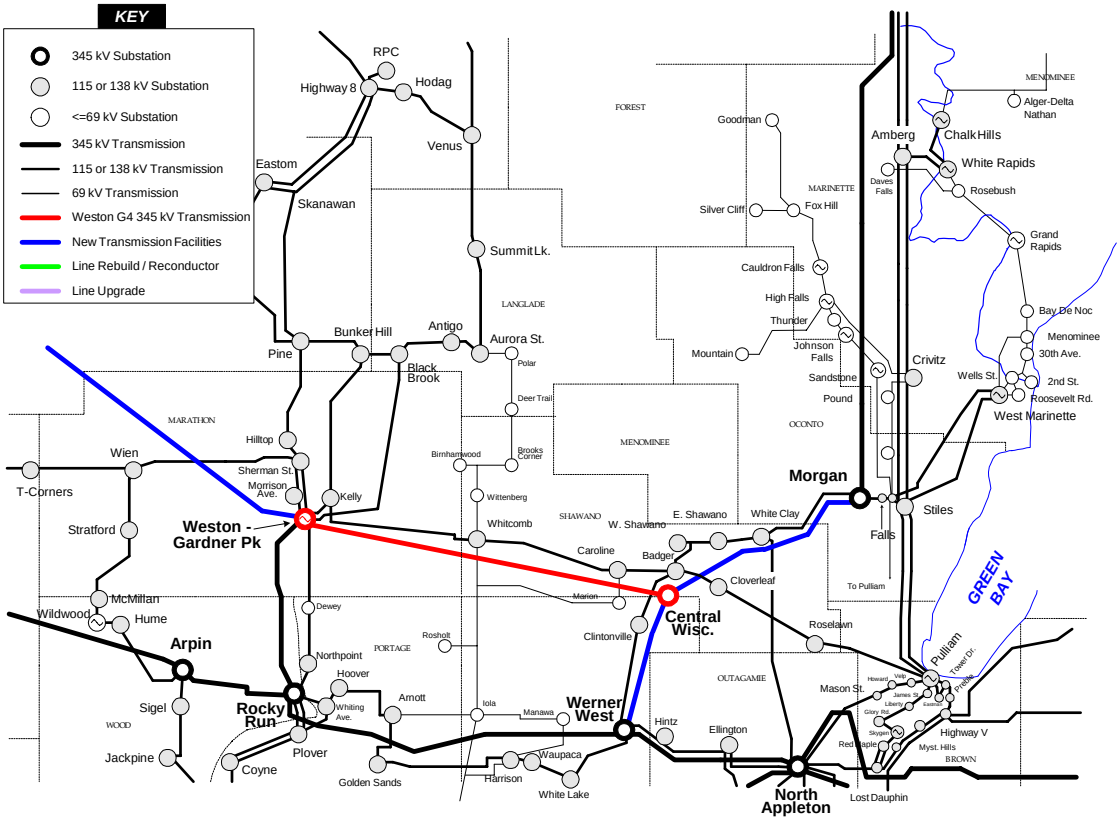
In addition, to preserve the system-wide 3,000 MW import capability, an upgrade of the existing Rocky Run – Plover 115 kV line will be required to support the planned 2008 in-service date of Weston 4. This upgrade will be relatively minor in nature, and to the extent Commission approval is required, ATC will seek approval of that project in a separate application.

C. Description

The Project involves construction of a new 345 kV transmission line, the construction of a new switching station, and the addition of line terminal equipment at the Gardner Park Substation, as summarized below. Figure 2 is a schematic map showing the new transmission line and its proposed interconnections to other elements of the transmission system (it does not show the specific route of the line).

avoid confusion, the switching station is referred to in some of the supporting documents and publicly available materials as a “substation.”

Figure 2. Proposed Project Connections



1. New Gardner Park – Central Wisconsin 345 kV Transmission Line. The major component of the proposed Project consists of a new 345 kV transmission line from the Gardner Park Substation located near WPSC's existing Weston generation plant to the new Central Wisconsin Switching Station, a distance of approximately 52 miles. The new transmission line is proposed to be entirely overhead construction, primarily on double-circuit single-pole structures.

In accordance with the Commission's regulations, ATC is presenting two alternative routes for the Gardner Park – Central Wisconsin 345 kV Transmission Line. *See* WIS. ADMIN. CODE § PSC 111.55(10) (2000). As described in greater detail in Section 5.02.3 of the accompanying TSD, ATC used the State energy policy law as a principal guide in identifying and evaluating route corridors. WIS. STAT. §1.12(6)(2003). In the interest of greater flexibility in route selection, ATC has, in addition to its Proposed and

Alternate routes, provided information on other route segments it studied but ultimately decided not to propose.

The Proposed Route exits the Gardner Park Substation and heads to the east along existing transmission line corridors, and then primarily follows the existing route of the 115 kV Line A-313* until it intersects with the line designated by ATC as "J-36" south of the existing Kelly Substation, and then follows the existing route of Line J-36 to the proposed site for the Central Wisconsin Switching Station adjacent to ATC's existing Badger Substation. The Alternate Route exits the Gardner Park Substation and heads to the east along the existing transmission line corridor of Line A-313, until it intersects with STH 29, where it follows the STH 29 corridor, staying within the WisDOT right-of-way (ROW) in most locations. The line then follows other transmission line and road ROWs to connect to the proposed site of the Central Wisconsin Switching Station.

2. New Central Wisconsin Switching Station. The Central Wisconsin Switching Station will be designed for three 345 kV line terminals in a ring bus configuration with provisions made to add a fourth terminal for a future connection. A new 24-foot by 40-foot control building will be constructed to house the protective relay and control panels along with the AC and DC electrical systems. The Central Wisconsin Switching Station will have an ATC substation name applied when the ordered site is determined. ATC has included information on three different potential sites for this switching station, each of which ATC owns or has an option to purchase. ATC's proposed site for the switching station is located adjacent to ATC's existing Badger Substation site.

3. Gardner Park Substation Improvements. At the Gardner Park Substation a new 345 kV breaker, 345 kV switches, and associated relaying and controls will be added. In Docket 137-CE-113, the Commission approved the construction of the substation now referred to as the "Gardner Park Substation" as part of the Arrowhead – Weston Project. Additionally, in Docket 6690-CE-187, the Commission authorized the construction of additional facilities at the Gardner Park Substation for the interconnection of Weston 4.

* Line references such as "A-313" refer to the general designation that ATC uses to identify the transmission lines that comprise its transmission system.

D. Estimated Project Cost

The cost of the Project is dependent on the transmission line route and switching station site approved by the Commission. ATC estimates that the total cost of the Gardner Park – Central Wisconsin Project is estimated to be $94.2 million,* which includes approximately $68.8 million for the new Gardner Park – Central Wisconsin 345 kV Transmission Line using the Proposed Route described below, $11.6 million for the Central Wisconsin Switching Station using the proposed site described below, and $1.4 million for adding a 345 kV breaker-and-a-half position to the Gardner Park 345 kV bus. Detailed cost information is provided in Section 5.01.7 of the TSD.

E. Construction Schedule

Construction is planned to begin in November, 2006 and be complete in December, 2009. The Gardner Park – Central Wisconsin Project has a scheduled in-service dates of December 2009. This is the same in service date as the proposed Morgan – Werner West Project. The proposed Werner West 345/138 kV Substation has a scheduled in-service date of June, 2006. The Gardner Park Substation expansion, which would be required to connect that substation to the Gardner Park - Central Wisconsin 345 kV Transmission Line, has a scheduled in-service date of January, 2008, the same date as the substation expansion required for the 345 kV bus expansion to accommodate Weston 4. The terminal work required for tying the 345 kV line into these stations must be completed prior to December, 2009. Additional detail concerning the construction schedule is provided in Appendix H-3 of the TSD.

F. Request for Determination of the Impact Fee

American Transmission Company also requests that the Commission determine the amount of the Environmental Impact Fee required, and to thereafter determine the appropriate distribution of the amount of such fee

* The estimated costs included in the Application are based upon materials costs, including the cost of steel for pole construction, labor costs, real estate values, and other assumptions necessary to determine the estimated costs. Given the recent increase in the price of steel, the potential for increases in the cost of labor to construct the proposed facilities, and increase in land values, three significant components included in the cost estimates, ATC believes that the costs estimated will likely require adjustment if the Commission authorizes the proposed construction.

to the counties, towns, and villages as required. *See* WIS. STAT. § 196.491(3)(gm) (2003). ATC has determined the following information necessary to assist the Commission in determining the fee required. A chart showing this information is provided in Appendix G-1.

G. Conclusion

Based on the material contained in this Application, the WDNR Utility Permit Application, and any subsequent material requested by the Commission, WDNR, or their staff, American Transmission Company requests that the Commission issue a Certificate of Public Convenience and Necessity to construct the transmission facilities as described and in the manner set forth, and to determine the amount of the environmental impact fee and the allocation of that fee to the appropriate parties.

Respectfully submitted this eleventh day of March 2005.

American Transmission Company LLC and ATC Management Inc.

_____/S/_____
Stephen Parker
Manager, State Regulatory Affairs
ATC Management Inc.

TECHNICAL SUPPORT DOCUMENT

The information provided below follows the format of the Public Service Commission of Wisconsin (PSCW or Commission) and the Wisconsin Department of Natural Resources (WDNR) *Information Requirements for Electric Transmission Construction Projects (Part 5.00)*, draft version 9, for electric transmission construction projects. The information provided relates to the proposed construction for which authority is sought in this Application.

5.01 ENGINEERING INFORMATION

5.01.1 Type and Location of Line Construction

American Transmission Company proposes to construct approximately 52 miles of new 345 kV transmission line between the Gardner Park Substation, currently under construction, and the proposed Central Wisconsin Switching Station along a combination of existing transmission line, road, and new rights-of-way (ROW), depending on the route determined by the Commission. The Proposed Route is entirely on existing transmission line corridors and would rebuild nearly all of the 115 kV Line A-313 between the Gardner Park and Kelly substations, and the 115 kV Line J-36 between the Kelly and Badger substations. The new line will interconnect with the proposed Morgan – Werner West Project, proposed in Docket No. 137-CE-123, at the Central Wisconsin Switching Station. All construction is planned to be overhead.

5.01.2 Size and Configuration of Lines

Size of lines

The Proposed Route is approximately 52 miles in length. If the Alternate Route is selected, the line would be approximately 61 miles long.

On either route, the 345 kV circuit will be constructed overhead using T2-1113 kcmil ACSR (Bluejay) conductor. The typical span lengths and structure heights are shown on the ROW cross sections included in the figures in Appendix C associated with each route segment.

In areas where the new 345 kV circuit follows the route of an existing 115 kV circuit, the existing H-frame structures will be removed and replaced with double-circuit single-pole structures supporting both circuits, with the existing circuit reconstructed using T2-556.5 kcmil ACSR

(Dove) conductor. One exception would be the rebuild of the A-313 circuit out of the Weston site (Proposed Route). That circuit would be constructed with a short section of 345 kV conductor (T2-1113 kcmil ACSR) to replace the smaller 115 kV conductor. The existing A-313 line is designed and built to 345 kV specifications from where the F-110 line turns north to Kelly Substation to the Blackbrook Substation. If the Alternate Route is selected, the existing A-313 bundled 795 kcmil ACSR (Drake) conductors will be transferred to the new 345 kV structures from this point to where it intersects with STH 29.

Configuration of lines

The 345 kV line will be constructed with the appropriate structures and insulators for operation at 345 kV. The line will be constructed on weathering steel single-pole structures utilizing arms with I-string or V-string insulators. All 345 kV steel pole structures will utilize concrete caisson foundations.

Above the primary conductors will be two shield wires, consisting of either (1) one optical ground wire (OPGW) and one 7/16-inch EHS steel wire or (2) two OPGWs.[*]

5.01.3 Transmission Studies

In accordance with the requirements of the Federal Energy Regulatory Commission (FERC), and the open access transmission tariff (OATT) of the Midwest Independent Transmission System Operator, Inc. (Midwest ISO), ATC conducted five Generator Interconnection studies to assess the impact on ATC's existing transmission system of interconnecting a new, 500 to 550 MW generating facility, and to determine the nature and extent of any facilities that would be required to provide the requested interconnection. The studies performed are:

- Gardner Park – Central Wisconsin 345 kV Transmission Line, Project Planning Document, dated 02/22/05;

[*] The existing lines J-36 and A-313 have fiber optics that are shared by third-parties. Should the selected route use these corridors, ATC anticipates that the new fiber shield wires would accommodate these existing uses.

- Generator Interconnection Request GIC044, Facility Study Report, dated 08/29/03;
- Generator Interconnection Request GIC044, Facility Study Report Addendum, dated 12/18/03;
- Generator Interconnection Request GIC044, Facility Study Report Addendum II, dated 10/04/04; and
- Generator Interconnection Request GIC044, Facility Study Report Addendum III, Revision 1, dated 02/24/05.

Further, in connection with transmission service requests made by WPSC and Dairyland Power Cooperative under the terms of the Midwest ISO OATT, ATC performed three transmission service studies to assess the ability of ATC's existing transmission system to receive the energy generated by Weston 4, to assess the ability of ATC's existing transmission system to transmit the energy produced by Weston 4 in a reliable manner, and to determine the facilities that would be required to provide the requested transmission service. The transmission service studies that were performed are:

- Facility Study Summary for Request #75000492, dated 08/27/03;
- Facility Study Summary for Request #75000492, Revision 1, dated 01/05/05;
- Facilities Study Summary - 75439243, dated 09/20/04; and
- System Impact Study for Long-Term Firm Transmission Service – 75994088, dated 11/19/04.

The study reports concluded that the addition of Weston 4 will cause overloads and system instability if the existing transmission system in the area is not reinforced. They also indicate that without other reinforcement, the addition of Weston 4 could reduce the available transfer capacity made available by the new Arrowhead – Weston 345 kV Transmission Line, thereby reducing one of the key benefits of that project. These studies are all included in Appendix B.

5.01.3.A System Normal

The addition of Weston 4 would cause overloads even under system normal conditions. The 115 kV line (generally referred to by ATC as line F-110) between the Gardner Park Substation and Kelly Substation would be overloaded with no outages on the system. The power flow study results are included in the Transmission Service Request study results discussed in Section 5.01.3E.

5.01.3.B Single Contingencies

Under a number of different single contingency conditions,* numerous overloads occur. One of the critical elements is the single west-to-east 345 kV pathway across central Wisconsin, the King – Eau Claire – Arpin – Rocky Run – North Appleton line. The outage of any portion of that path will result in severe impacts to other portions of the system. The addition of the Arrowhead – Weston 345 kV Transmission Line will address impacts due to outages of King – Eau Claire, Eau Claire – Arpin, and Arpin – Rocky Run line segments, but from Rocky Run Substation to North Appleton Substation, there would still be a single 345 kV path. The power flow study results are included in the Transmission Service Request study results discussed in Section 5.01.3E.

5.01.3.C Alternative Solutions

Several single 345 kV transmission line options were investigated to address the stability and transmission service limitations of the existing transmission system in order to determine what facilities might be required to interconnect the Weston 4 generating facilities. The study results showed that one new 345 kV line out of Gardner Park Substation (the approved Arrowhead – Weston 345 kV Transmission Line) would not ensure acceptable stability at Weston. Studies indicated that, regardless of the 345 kV project that was selected, at least one other project would be required to meet ATC's stability criteria.

* For planning purposes, ATC primarily uses a "single contingency" analysis. Single contingency analysis assumes that one element of the transmission system (line, transformer, etc.) is unavailable, and then evaluates the operation of the remaining elements of the transmission system without the availability of that transmission system element.

In evaluating the alternatives, ATC considered whether each alternative would address system stability and requested energy delivery requirements from Weston 4, as well as preserving ATC's ability to meet the import target associated with the previously approved Arrowhead – Weston 345 kV Transmission Line. ATC also considered the cost of the alternative projects, whether they provided a reliability-enhancing second east-west 345 kV circuit through central Wisconsin (currently the only east-west connection in the area is the North Appleton to Rocky Run line), constructability issues, and the flexibility to accommodate a range of different generation dispatch conditions and import levels in the region.

Addressing the system stability and delivery requirements of Weston 4 while preserving the targeted import capacity associated with the Arrowhead – Weston 345 kV Transmission Line, required at least one additional system reinforcement in addition to the primary alternative.

The electrical alternatives conceived and considered by ATC to address system limitations are as follows:

System Alternative 1 (the proposed Project): Gardner Park – Central Wisconsin Project. Based on the studies that have been performed, the preferred alternative to meet the needs of Weston 4 and transmit the energy it will produce is to construct a new 345 kV line from Gardner Park Substation to a location referred to as Central Wisconsin Switching Station on the proposed Morgan – Werner West Project. In addition to the proposed Project, ATC would also need to perform additional terminal work on the Rocky Run – Plover 115 kV line (S-45). This 115 kV line work is relatively minor in scope, and will be the subject of a separate application, if one is required.

System Alternative 2: Gardner Park – Morgan 345 kV line. ATC also evaluated constructing a new 345 kV line from Gardner Park Substation to the Morgan Substation and adding a new 138 kV transmission line from Clintonville to the proposed Werner West Substation. (If the Morgan – Werner West 345 kV Transmission Line is not constructed, the Werner West – Clintonville 138 kV Transmission Line is still needed for reliability reasons). This alternative would also require that ATC perform terminal work on the Rocky Run – Plover 115 kV line (S-45). ATC would also need to add a second 345/138 kV

transformer at the Plains Substation, although that transformer is expected to be required without regard to Weston 4.

System Alternative 3: Gardner Park – Rocky Run 345 kV line. ATC also considered constructing a second 345 kV line from the Gardner Park Substation to the Rocky Run Substation. In addition to constructing the new 345 kV line, this alternative would require ATC to do all of the following:

- Uprate line/terminal on the Rocky Run – Plover 115 kV line (S-45);
- Rebuild the Kelly – Badger 115 kV line (J-36);
- Uprate the Rocky Run – Werner West 345 kV line (L6831);
- Uprate line/terminal on the Whiting Avenue – Hoover 115 kV line (H-138);
- Rebuild the Rocky Run – Whiting Avenue 115 kV line (M-91);
- Uprate line/terminal work on the Port Edwards – Sand Lake 115 kV line (X-11);
- Replace the 138/115 kV transformer at Hoover Substation; and
- Replace the Badger Substation 138/115 kV transformer.

System Alternative 4: 115/138 kV line upgrades and additions. ATC considered constructing two new 115 kV lines from the Gardner Park Substation to the Rocky Run Substation. Under this alternative, ATC would be required to rebuild the existing 115 kV line from the Weston Substation to the Rocky Run Substation and construct one new 138 kV line from the Gardner Park Substation to the Badger Substation. ATC would also have to rebuild and convert to 138 kV the Kelly to Badger 115 kV line and add a new 138/115 kV transformer at the Kelly Substation. Furthermore, this alternative would require ATC to add: (1) a new 138/115 kV transformer at the Gardner Park Substation; (2) a new 138/69 kV transformer at the Caroline Substation to replace the existing 115/69 kV transformer; and (3) a new 138/69 kV transformer at the Whitcomb Substation to replace the existing 115/69 kV transformer. This alternative would also require ATC to:

- Uprate line/terminal on the Rocky Run – Plover 115 kV line (S-45);
- Uprate the Rocky Run – Werner West 345 kV line (L6831);
- Uprate line/terminal on the Whiting Avenue – Hoover 115 kV line (H-138); and
- Replace terminal equipment on the Rocky Run – Gardner Park 345 kV line (V-308).

Analysis of System Level Alternatives

System Alternative 1, the proposed Project, meets the Weston 4 stability and transmission service requirements. Only one additional project is required to maintain the 3,000 MW import capability target that the Arrowhead – Weston Project will provide. In addition, this alternative provides a significant system benefit — an additional west to east 345 kV transmission path that strengthens the system between north-central and northeastern Wisconsin. This path, parallel to the existing Rocky Run – North Appleton 345 kV line, significantly improves the reliability of the system under a wider variety of multiple contingency conditions thus improving operating flexibility. This Project would best unload lower voltage lines in the area, thus improving load serving capability to the greatest degree among the alternatives. This Project would also provide for the most flexibility to accommodate changes in generation dispatch in the area and variations in system import levels.

System Alternative 2 also meets the Weston 4 stability and transmission service requirements. This alternative would require ATC to construct two additional projects to preserve the 3,000 MW import capability target – one more project than the proposed Project. The stability performance is slightly inferior to the proposed Project. However, like the proposed Project, System Alternative 2 provides the desired west to east 345 kV path for overall system reliability. Because of this, it is the next best alternative.

System Alternative 3 meets the Weston 4 stability and transmission service requirements. However, eight additional projects would be required to preserve the 3,000 MW import capability target after the construction of Weston 4. Although slightly lower in capital cost than the proposed Project, System Alternative 3 has significant

disadvantages. The length of time and the difficulty in scheduling outages to construct all these additional upgrades must be considered when weighing System Alternative 3, because the outage requirements would necessitate complex staging of various projects. This alternative does not provide the operating flexibility provided by alternatives that create a new west to east 345 kV transmission path. Also, System Alternative 3 is not as robust at System Alternatives 1 and 2 from a load serving perspective, considering changes in generation dispatch in the area and considering variations in system import conditions.

System Alternative 4 meets the stability and transmission service requirements for Weston 4. However, the stability response is slightly worse than System Alternative 1 (please refer to the clearing times in Section 5.01.3.E). In addition, System Alternative 4 would require four additional projects to preserve the 3,000 MW import capability target after Weston 4 is built.

Although System Alternative 4 has the advantage of avoiding 345 kV transmission line construction, it would likely involve construction impacts similar to System Alternative 1 from Weston to the Shawano/Belle Plaine area, because Line J-36 between the Gardner Park and Badger substations would need to be rebuilt. Finally, the construction and environmental issues at Rocky Run for System Alternative 4 are similar or more difficult than those noted for System Alternative 3 due to the need to reroute and terminate two new lines. For these reasons, System Alternative 4 is not the most appropriate long-term solution.

Based on the studies performed and the comparative analyses of the study results for the four alternatives considered in meeting the interconnection and transmission service requirements of the Weston 4 generating facility, as well as the ability of the alternatives to provide a significant reinforcement of ATC's northern transmission system, the best all-around solution is the construction of the proposed Gardner Park – Central Wisconsin Project.

5.01.3.D Electrical Losses for Each Alternative

System loss analyses were performed to evaluate the loss reductions. The value of system loss reductions associated with each of the four system alternatives, including the additional construction that would be required to sustain ATC's transfer capability, were projected. Capacity

loss costs were based on loss differentials during peak load conditions and the cost of replacement capacity. Energy loss costs were based on energy loss differentials from both peak and shoulder peak load periods (75% of peak load) and valued based on energy futures prices for 2005 escalated at 3.0%. The market prices for energy were based on prices published in *Power Daily North America* on December 21, 2004.

The 2009 summer peak and 2009 shoulder peak cases were used. System loss reductions and estimated annual gigawatt-hour (GWh) savings are shown in the table below. In all four alternatives, the most significant loss reductions occurred during shoulder peak load conditions. System Alternative 1 provided the greatest improvement in losses for both loading scenarios (peak and shoulder peak) with a reduction of 4.2 MW for the peak load conditions and 26.0 MW for the shoulder peak load conditions.

Table 1

	System Loss Reductions			
Case	Alt. 1	Alt. 2	Alt. 3	Alt. 4
2009 Peak	4.2	4.1	4.0	3.9
2009 Shoulder Peak	26.0	24.8	23.5	24.0
Estimated Annual GWh Savings	221.1	210.9	199.9	204.1

Note: System Loss reduction values are in MW.

System losses were also compared among the alternatives. The table below shows the comparison of the losses of the other three alternatives to System Alternative 1, the proposed Project. Because peak load periods occur a small percentage of the year, and shoulder peak load conditions are a far more frequent operating condition, energy loss reductions are largely driven by shoulder peak conditions, and the total loss cost savings are largely driven by energy loss reductions.

Table 2

	System Losses In Excess Of Lowest Alternative			
Case	Alt. 1	Alt. 2	Alt. 3	Alt. 4
2009 Peak	0.0	0.1	0.2	0.3
2009 Shoulder Peak	0.0	1.2	2.5	2.0
Loss Penalty – 20-yr PV	$0	$4,090,117	$8,513,219	$6,942,616

Note: System Alternative 1 is used as the base for comparison because its system losses were the lowest of the four alternatives. Therefore, its loss penalty cost is shown as zero.

The table compares the four alternatives against the alternative that provided the largest loss reduction: System Alternative 1. System loss costs for System Alternative 1 were projected and reduced to a net present value over a 20-year period based on the market prices noted above. (The net present value calculation is detailed in Appendix B-10.) This resulted in an estimated present valued loss cost savings of $90,537,000. The estimated cost savings associated with system losses for the other three system alternatives were lower than System Alternative 1; thus, they are listed in the table as a loss penalty.

5.01.3.E Short-Circuit, Stability, and Thermal Analyses

Short-circuit and stability analyses were performed as part of the Generator Interconnection Studies for Weston 4. The GIC044 reports provided for those analyses are provided in Appendix B to this Application. Transmission Service Request studies were also performed to identify the transmission system modifications that may be required to ensure reliable power delivery from Weston 4. The Transmission Service Facility Study reports are provided in Appendix B.

Short-Circuit Analyses. The short-circuit analyses identified numerous circuit breaker replacements that are required to eliminate over-dutied equipment for all alternatives.

Stability Analyses. The Generation Interconnection and Transmission Service studies identified several major system stability and power delivery problems associated with adding Weston 4 to the existing transmission system. Several options for addressing these problems

were investigated and evaluated in conjunction with the system reinforcements listed in ATC's 2004 Ten-Year Assessment. The alternatives discussed in this section were initially evaluated in the Weston 4 generator interconnection and transmission service request facility studies.

Simulation results indicated that acceptable stability (9.5-cycle or greater critical clearing time (CCT) for breaker failure and 4.5-cycle or greater CCT for prior outage) could not be achieved with only two 345 kV lines out of the Gardner Park Substation. The prior outage of one 345 kV line coupled with the outage of the second 345 kV line would force the entire output of the Weston 4 generator onto the 115 kV system, which would cause instability in one or more Weston units.

American Transmission Company's studies indicated that one new 345 kV line is not sufficient to meet ATC stability criteria. In the initial studies for Weston 4, two alternatives were identified as the most promising solutions to both the thermal and stability problems associated with Weston 4. Detailed stability studies were performed for both alternatives. The results are shown in the tables in the Generator Interconnection Request GIC044, Facility Study Report, Appendix B-2.

Stability studies were performed on the final four alternatives evaluated (listed in Section 5.01.3.C). The most restrictive system faults from a stability perspective were found to be:

- Fault on the Gardner Park – Rocky Run 345 kV line with breaker failure; and
- Fault on the Gardner Park – Rocky Run 345 kV line cleared in primary clearing time (normal) with the prior outage of the Arrowhead – Weston 345 kV Transmission Line.

The stability results for all four system alternatives for these two critical contingencies are shown in the table below.

Table 3
Critical Clearing Times: Gardner Park – Rocky Run Faults

Alternative	Prior Outage	Clearing	Min. CCT	Actual CCT	Prior Outage	Clearing	Min. CCT	Actual CCT
Alt. 1	None	Breaker Failure	9.5	10.0	ARR-GDP 345	Normal	4.5	8.0
Alt. 2	None	Breaker Failure	9.5	9.5	ARR-GDP 345	Normal	4.5	7.0
Alt. 3	None	Breaker Failure	9.5	10.5	ARR-GDP 345	Normal	4.5	9.0
Alt. 4	None	Breaker Failure	9.5	9.5	ARR-GDP 345	Normal	4.5	7.0

Notes: ARR-GDP 345 represents the Arrowhead – Weston 345 kV Transmission Line. Min. CCT specifies the minimum permissible breaker failure critical clearing time for the protection equipment to clear the fault, while Actual CCT specifies the actual critical clearing time for that alternative and contingency studied.

The minimum permissible breaker failure critical clearing time (CCT) is 9.5 cycles, and the minimum permissible prior outage CCT is 4.5 cycles. Critical clearing time is the longest time that a fault can be applied under a described condition before one or more generating units go unstable. For example, if a fault cleared in 10.0 cycles results in all units remaining stable while a fault cleared in 10.5 cycles results in one or more generators going unstable, the critical clearing time for this fault is 10.0 cycles. Thus, the longer critical clearing times reflect a better system stability response.

The table shows that all four alternatives meet the stability criteria for both faults, that the time for the system protection equipment to isolate the fault (Min. CCT) is shorter than the length of time for the system to go unstable (Actual CCT).

Thermal Analyses. The Transmission Service Request studies performed for Weston 4 used the same final alternatives that were evaluated in the final stability analyses. The alternatives were all found to provide a sufficient transmission system to reliably provide the power delivery of Weston 4 while also preserving the transfer capability target of 3,000 MW.

All transmission service study results are summarized in the study reports for Transmission Service Requests #75000492 (along with Revision 1 thereof), #75439243, and #75994088, all of which are included in Appendix B.

5.01.3.F Network Transmission Studies

The proposed construction will occur in Wisconsin and does not require the approval of any other regulatory agency that has transmission line siting authority. No regional transmission system studies were performed. ATC has provided the planning studies performed to the Midwest Independent Transmission System Operator, Inc. (Midwest ISO), the regional transmission organization responsible for administering transmission service over ATC's transmission lines, and the Midwest ISO has included the proposed construction of the Gardner Park – Central Wisconsin Project in Appendix A to the Midwest ISO's regional transmission expansion plan.

5.01.3.G Regional Access Studies

The Gardner Park – Central Wisconsin Project while it strengthens ATC's 345 kV transmission system, is not part of a regional access project or system enhancement program, but has been included in the Midwest ISO regional transmission plan as part of the planned improvements of ATC's transmission system.

5.01.3.H Distribution Alternatives

There are no feasible distribution alternatives that will address the identified requirements.

5.01.4 Substation Facilities

American Transmission Company proposes to add a new line terminal at the Gardner Park Substation and construct a new Central Wisconsin Switching Station. The Gardner Park Substation is the termination point at Weston for the Arrowhead – Weston 345 kV Transmission Line approved in PSCW Docket 5-CE-113. The Central Wisconsin Switching Station will be renamed to conform with ATC naming convention when a site is determined. The Central Wisconsin Switching Station is proposed to be the terminus of the Gardner Park – Central Wisconsin 345 kV Transmission Line. The Morgan – Werner West 345 kV Transmission Line

is proposed to be routed through the proposed Central Wisconsin Switching Station as well. The physical layout of the proposed switching station (including various configurations and alterative sites) is provided in Appendix H-1, and electric schematic diagrams are provided in Appendix H-2. Additional information regarding the switching station proposed in this Application is located in Section 5.06.

American Transmission Company also proposes to add a new 345 kV breaker, 345 kV line disconnect switches, and associated protective relaying and controls at the Gardner Park Substation. The physical layout of the substation is provided in Appendix H-1, Exhibit 6, and an electric schematic diagram is provided in Appendix H-2, Exhibit 2. No changes are expected in the physical size of the Gardner Park Substation, and the planned control building has been designed with adequate AC and DC service for the new line. All upgrades and additions are on land owned by ATC.

The proposed Central Wisconsin Switching Station will be designed for three 345 kV line terminals in a ring bus configuration with provisions made for a fourth terminal in the future. A new 24-foot by 40-foot control building will constructed to house the protective relay and control panels along with the AC and DC electrical systems.

American Transmission Company has identified three appropriate sites for the construction of the Central Wisconsin Switching Station: (1) adjacent to the existing 138 kV Badger Substation where ATC has a 35-acre parcel owned in fee (ATC's Proposed Site); (2) near Range Line Road (one-half mile west on the existing J-36 line) where ATC has 20 acres under voluntary option; and (3) one site in the Shawano area near River Bend Road on the north side of STH 29 where ATC has 32 acres under voluntary option. All sites under consideration can accommodate the proposed switching station facilities and related transmission line connections.

5.01.5 Contractual Agreements

Please refer to the Generation-Transmission interconnection agreement by and between ATC and WPSC dated December 22, 2003 in Appendix B-11.

5.01.6 Transmission Service Agreements

Wisconsin Public Service Corporation has requested transmission service from its authorized Weston 4 generating facilities under the terms of the Network Integrated Transmission Service Agreement between WPSC and ATC dated December 27, 2000. The transmission service will be provided, assuming authorization is received to construct the facilities requested in this Application pursuant to that agreement. Transmission service provided under that agreement is provided under the terms of the Midwest ISO OATT and is administered by the Midwest ISO. A copy of the Network Integrated Transmission Service Agreement is provided in Appendix B-12. In the event that the Commission approves Dairyland Power Cooperative acquisition of an interest in Weston 4, ATC would anticipate that Dairyland Power Cooperative would enter into an appropriate transmission service agreement.

5.01.7 Transmission Costs

5.01.7.A Alternatives

Detailed Estimated Costs for Each Alternative. Cost details are listed for construction, removal, maintenance and retirement. The costs included below reflect gross project cost as defined in the Commission's regulations. WIS. ADMIN. CODE § PSC 112.02(4)(2000). A breakdown of the estimated costs for ATC's Proposed Route and Alternate Route together with the costs associated with the modifications to the substations is provided below. Common substation facilities include site preparation, ground grids, control houses, conduit, raceways, trenches, and other items required for any substation. The proposed facilities to be retired and their gross book cost are listed below:

Table 4

			Proposed Route		Alternate Route
Capital Cost					
Transmission Lines					
345KV Line	GDP-Central WI	$	68,770,000	$	80,842,000
115kV Line	A313 Reconductor	$	134,000		incl. Above
115kV Line	J36 Reconductor	$	4,081,000	$	440,000
	Subtotal, Transmission	$	72,985,000	$	81,282,000
Substations					
Gardner Park Substation					
	345kV Facilities	$	1,372,000	$	1,372,000
	Subtotal	$	1,372,000	$	1,372,000
Central WI Switching Station					
	Land	$	125,000	$	125,000
	345kV Facilities	$	11,427,000	$	11,427,000
	Subtotal	$	11,552,000	$	11,552,000
	Subtotal, Substation	$	12,924,000	$	12,924,000
Precertification (planning, studies, applications & regulatory approval)		$	4,000,000	$	4,000,000
Environmental Fee (5% of 345kV capital cost)		$	4,267,000	$	4,707,000
	Precertification costs split by 345kV vs 138kV capital cost				
	Total Capital Cost	$	94,176,000	$	102,913,000
Removal Cost					
	Transmission Line Removal				
345KV Line	GDP-Central WI	$	-	$	333,000
115kV Line	A313	$	231,000	$	334,000
115kV Line	J36	$	2,447,000	$	-
	Total Removal Cost	$	2,678,000	$	667,000
Operation & Maintenance Cost					
345KV Line	GDP-Central WI	$	-	$	-
115kV Line	A313	$	38,000	$	13,000
115kV Line	J36	$	348,000	$	-
	Total O&M Cost	$	386,000	$	13,000

Retirement Cost

Transmission Line Retirement		
J36	$ (482,000)	
A313		$ (45,000)
86504 W, Shawano-Badger		$ (766,000)
Total Transmission Retirement Cost	$ (482,000)	$ (811,000)

5.01.7.B Cost Benefit Allocation Study

No cost benefit allocation study was performed because the proposed Project is solely for the benefit to ATC's customers.

5.01.7.C Electrical Losses

Please refer to Section 5.01.3.D for an explanation of the total amount of losses associated with the proposed transmission line construction, and the manner in which the loss cost savings were determined.

5.01.8 Construction Schedule and Procedures

Construction Schedule. The anticipated schedule for completion for the proposed work is presented in Appendix H-3. ATC is responsible for all construction for this Project.

The following is a description of general practices that ATC follows in constructing transmission facilities. Depending on the route determined by the Commission, one or more of these practices may be employed to construct the proposed facilities. Additional construction practices are set forth in the WDNR Utility Permit Application included at Appendix E-1.

Overhead Construction. In general, construction of an overhead transmission line requires right-of-way clearing, footing installation, pole installation, and the stringing of conductor and shield wire. These procedures are described in turn below.

Right-of-Way Preparation. Typically, for overhead construction, the easement width is cleared of trees and brush to allow access for construction and maintenance equipment and to eliminate future conductor-to-vegetation contacts. Normally, vegetation is removed to a height of less than 6 inches but no root removal is done. Brush or trees that are cleared are disposed of in accordance with the property owner's wishes in compliance with regulatory requirements, either by removing

the cleared material or storing on the easement or adjoining land. In upland areas, some vegetative material (cuttings) may be chipped and spread on the right-of-way if permitted by the property owner. Clearing adjacent to waterways requires the preservation of a vegetative buffer of approximately 50 feet. Hand clearing of select woody species may be required.

At new pole locations, access is necessary along with a level working area. Some grading may be required in proximity to the new pole foundation location. Please refer to ATC's Access Plan, provided in Appendix E-3, Figure 4.

Footing Installation. Concrete caisson footings are planned for all structures. The method of installation, diameter, and depth of the excavation will vary depending on the soil capability and structure loadings at any particular pole or structure location.

When constructing concrete caisson foundations the required hole is excavated, concrete caissons are formed using a rebar and bolt cage which is placed into the excavation, and concrete is poured to cover it. The complete caisson is allowed to cure to develop necessary strength. After the caisson is cured, the structure is mounted on the caisson using the exposed bolts. In general, the excavated holes will range from 6 to 13 feet in diameter and may be 18 to 58 feet in depth.

Excess soils from excavations in upland areas may be spread on the right-of-way and stabilized (seeded and mulched) or hauled to an offsite disposal location depending on the property owner's requirements. In any area where conditions may be conducive to erosive losses (erodable soils, slopes, wetlands or streams adjacent to site), appropriate erosion control measures as described in the most recent WDNR Construction Site Best Management Practices (BMPs) will be installed and maintained until final restoration and revegetation is complete.

The presence of groundwater at or near the ground surface can impact the construction procedures used when auguring holes. If groundwater flow into an excavation results in the excavation becoming unstable, it is often necessary to install a casing to support the walls of the excavation and/or to dewater the excavation. Depending on site conditions, the extracted groundwater may be de-silted and discharged to a nearby water body or to an upland area where it is allowed to re-infiltrate. In

some situations it may be possible to augur the hole using casings to maintain the stability of the hole without dewatering the site during excavation. In this situation, the groundwater is removed from the casing as it is displaced by concrete pushed into the excavation via a special concrete-pouring sleeve known as a tremie. This water may contain solids from the auguring process or from contact with the fresh concrete, and is often pumped out of the hole and transported by appropriate tanker truck either to a treatment facility or to an upland site where it can be allowed to settle and re-infiltrate.

In the event that shallow bedrock is encountered, modifications to the standard footing designs by either shortening the footing length and socketing into solid bedrock or anchoring directly into the bedrock may be required. Another option would be removing the rock via blasting or special drilling methods to develop the full footing length. A survey of the Proposed Route did not indicate that any bedrock would be encountered at any currently known pole location.

Very weak soils will also likely be encountered. A proposed method of footing installation in these soils may utilize vibratory methods. This consists of installing a steel caisson up to approximately sixty feet long in areas where soil stability is a concern. At locations where vibratory techniques are used, the upper four feet of soil is removed by use of a backhoe and transported to an approved upland location for disposal or dispersal. The caisson is then advanced using vibratory methods. When the caisson has been fully advanced, the base of the structure is put in place by bolting a platform onto the steel caisson.

Pole Installation. After the base of the structure is in place, the top section(s) of the structure are assembled and put into place using a crane. The insulator strings may already be in place on these structure sections, or they may be installed just prior to conductor installation.

Conductor Installation. Once the poles are fully assembled and installed, the conductor is installed by using blocks (pulleys) on the ends of insulator strings and pulling lines. After blocks are installed at an adequate number of structures, the phase conductors are pulled in place using the pulling lines and blocks. The conductor is then tensioned and clipped to the insulator strings. Helicopters may be used for conductor installation in special situations where access is limited.

Site Access. It is common practice to use a bucket truck to lift workers and the required hardware (insulator strings, pulling dollies, etc.) to their locations on each structure to allow the work to be accomplished efficiently. In most areas, where bucket trucks can be used to access the construction location, much of the work will be done using this equipment and method. In areas where this type of vehicle access would be difficult, such as in unfrozen wetland areas or where access is otherwise limited, alternative methods of construction will be used. The alternative methods still require that workers and the required hardware be able to obtain access to each structure to perform the work. However, the workers may be able to walk in or utilize lighter weight equipment (ATVs, tracked equipment, etc.) to access the structure. In these situations, ladders and climbing equipment may be used to gain access to the conductors and perform the work.

When the ground is not frozen, low-impact machinery with wide tracks will be used in unavoidable wetland areas and protective mats will be used in areas where the ground is unstable. To minimize potential impacts, protective mats may also be used as ramps in areas of steep slopes or to cross wetlands or waterways. The Environmental Inventory Tables (EITs), included in Appendix E-2, for the Proposed Route, the Alternate Route, and other segments the proposed construction procedures for all wetlands and waterways identified within the ROW.

5.01.9 Transmission Tariffs

Transmission service will be provided, once the proposed facilities are constructed, under the provisions of the OATT of the Midwest ISO.

5.02 PROJECT DEVELOPMENT AND ALTERNATIVES

5.02.1 System Level Alternatives

All alternatives considered were system level alternatives, and are discussed in Section 5.01.3.C.

5.02.2 Local Level Alternatives

There are no distribution level alternatives that could provide the required stability, fault duty or thermal enhancements to the transmission system required to meet the needs of the Weston 4 generating facilities or ATC's transmission system.

5.02.3 Evaluation Factors

The Gardner Park – Central Wisconsin Project and the Morgan – Werner West Project are independently justified on the basis of their respective need and their ability to strengthen or expand the overall transmission system. However, due to their geographic proximity, a single concurrent routing study and public process was conducted. ATC started with a broad study area encompassing the Morgan – Werner West Project and the proposed Project. Key milestones of the routing study and public process were identified and include Phase I – Need and Benefit, Phase II – Environmental Routing Criteria and Preliminary Study Corridors, Phase III – Preliminary Routes, and Phase IV – Proposed and Alternate routes. Each phase included a public participation component. Primarily, Open House venues were used to help facilitate public participation. The overall objectives of these Open Houses were to present information, in conjunction with each phase of the routing study, and solicit public comments. The following discussion further describes each phase of the routing study and public process.

Routing Study and Public Participation Process, Corridor and Switching Station Location Process

Phase I – Need and Benefit. American Transmission Company conducted a series of Open Houses in late January and early February 2004 to inform the public of the Project, the general area of study, the need and benefits, and the overall process and schedule. ATC solicited general public comment. Invitations for the Phase I Open Houses were sent to land owners and local residents, interested stakeholders, and affected local units of government including counties, towns, cities and villages, within the study area. The total number of invitations mailed was approximately 7,500. Over 700 people attended the Phase I Open Houses, which were held in five locations throughout the study area.[*]

Phase II – Environmental Routing Criteria. State energy policy defines four categories of land uses to be used for new transmission lines in descending preference: (a) the use of existing utility (transmission line

[*] As noted previously, ATC's public outreach efforts combined the proposed Project with the Morgan – Werner West 345 kV Project. The discussion in this section combines the public outreach and resulting routing efforts of both projects.

and pipeline) corridors, (b) transportation (primarily highway and rail) corridors, (c) recreational trail corridors, and (d) new (i.e., secondary roads and administrative or property boundaries) corridors, in descending order of priority, to the extent feasible and consistent with economic and engineering considerations, reliability, and protection of the environment for siting an electrical transmission line. WIS. STAT. § 1.12(6)(2003). Environmental routing criteria include, but are not limited to, these corridors (opportunities) and elements of the human and natural environment that may be subject to impact (sensitivities). Routing opportunities are identified as providing advantageous routing corridors and are characterized by the potential to parallel or share a corridor occupied by existing linear facilities or physical features. Sensitivities are those environmental routing criteria that require some consideration of potential impact. These include land uses such as wetlands, agricultural use areas, forested areas, residential use areas, churches, cemeteries, hospitals, schools, biologically sensitive areas, and archaeological sites. In such situations, ATC took into consideration the specific construction methods, mitigation measures, or additional licensing/permitting procedures that may be required.

In light of these statutory provisions, ATC identified the following sensitivities that may potentially occur within the overall project study area, and influence the ultimate route selection:

- Archaeological sites that can be spanned;
- Areas that are geologically unstable or highly erosive;
- County parks and recreational areas, municipal parks, and parks owned or administered by other governmental subdivisions;
- Designated or registered national historic districts, memorial parks, wildlife areas, wildlife refuges, game management areas, or forests and forest management areas;
- Designated or registered state or national parks;
- Existing residential areas or planned residential areas (as available from local and county governments);
- Federal, state, and agency owned property (i.e., USFWS and BLM land);

- Floodways/Floodplains;
- Military facilities;
- Mines, quarries and gravel pits;
- National Wild and Scenic rivers;
- Occupied buildings;
- Population centers;
- Prime farmlands and areas of ongoing agricultural activity, including center pivot irrigation systems where the Project would interfere with irrigation practices;
- Scenic areas, including scenic travel routes (i.e., designated Rustic Roads and Lake Michigan Circle Route);
- Sensitive receptors including licensed daycare facilities, playgrounds, hospitals, nursing homes, schools, churches, and cemeteries;
- Sensitive species occupied and potential habitat;
- State and county lands not protected for environmental reasons or used for parks or recreation (i.e., state and county forests).
- State-designated Wild and Scenic rivers;
- Unique habitats (Oak Savanna, fen, prairie remnants, etc.);
- Waterfowl nesting or rearing areas; and
- Wetlands.

See WIS. STAT. § 1.12(6)(2003). American Transmission Company identified other criteria on which the Project would minimize direct effects to the greatest extent possible:

- Areas protected for their special environmental or cultural resources including state natural areas, state scientific areas, national register sites, national landmarks, national monuments, nature conservancy

preserves, state and national wilderness areas, and national wildlife refuges;

- Existing occupied dwelling units;
- Landfills/dumps;
- Native American tribal land (reservations only);
- Obstruction-free zones of FAA-registered airports (public and private);
- Open water expanses greater than 500 feet;
- Sites listed on federal or state databases of known hazardous substance releases; and
- Threatened and endangered species nesting or critical habitat areas (as further discussed in Section 5.04.7 of this TSD).

Preliminary inventory of the occurrence of existing opportunities and sensitivities within the study area was initiated in February 2003 following data acquisition for the development of the Geographic Information System (GIS) geospatial database, into which the route opportunities and sensitivities would be collected for comparative evaluation. Using archived orthophotography and GIS, transmission line location opportunities within the study area were identified and mapped with respect to statutory priority. (See the Routing Study, Appendix I, Figure 1.) Sensitivities occurring within the study area were then identified and mapped as shown in Appendix I, Figure 2. The environmental routing criteria were evaluated in tandem, with the assistance of composite mapping (Appendix I, Figure 3) to determine which transmission line location opportunities were potential corridors in light of the sensitivities identified. Corridor preference for transmission line location is directly related to the occurrence of sensitivities within proximity or immediately adjacent to each of these existing linear features.

If a corridor had the potential to impact a protected species or its critical habitat, and no construction/mitigation planning could be implemented to avoid it, that corridor or transmission line route segment was removed from consideration. For example, a corridor segment was identified by

the public and also local WDNR officials to have an active rookery on it that was occupied by both Great Blue Herons and Great Egrets (the Great Egret is a species of concern in WI). Upon investigation, ATC determined that this corridor could not be utilized without direct damage to the nesting trees. Therefore, ATC eliminated that transmission line segment from further consideration.

Directional orientation was also a consideration during this initial phase of comparative analysis of the route segment opportunities traversing the study area. Opportunities traversing the study area along a continuous use of one existing ROW were qualified higher than those requiring a fragmented use of existing ROW. Consideration was also given to geographic diversity of routes. Engineering considerations or transmission system impact studies were preliminary at this time. Some opportunities, including existing 115 kV Line J-36 and a primary transportation corridor (STH 29), represented distinct opportunities, while other opportunities within the study area that provided geographic diversity or enhanced reliability were identified. In addition, ATC determined that it was appropriate to maintain the flexibility of two transmission line route options that could interconnect at any future or proposed switching station site.

Transmission line location opportunities that appeared preferable based on this analysis were then more thoroughly investigated using an area encompassing 1,000 feet on either side of the existing linear feature or opportunity to further assess the sensitivities associated with that line route segment's opportunities. These macro-analysis 2,000-foot corridors became the ATC's preliminary study corridors, as depicted on Appendix I, Figure 4. ATC began aerial field reconnaissance of these corridors in April 2004 and pedestrian reconnaissance in June 2004. New aerial photographs were taken, and specific features, particularly wetlands, were interpreted and classified from the aerial photographs of the corridors. Field reconnaissance assisted in the ongoing validation of data and also provided for the characterization of field-delineated wetlands. Data acquisition was ongoing at this time, incorporating the most currently available spatial data. "Nodes," located at the termination and intersection points of corridor segments, were also identified. Nodes have a unique numbering convention. New nodes were added in numerical order rather than using previous node designations that were removed. This segment naming convention allowed for individual and quick recognition or orientation of potential route opportunities. The

nodes are named by the letter "N" followed by a unique number and are numbered consistently in this CPCN Application and the WDNR Utility Permit Application.

Common intersections of the macro-analysis corridors provided for potential Central Wisconsin Switching Station sites. These potential sites were within the general interconnection area in central Shawano County, as identified during Phase I of the routing study and public process.

The location of the switching station is a key element in the overall transmission line siting and transmission line route or segment selection process. Access for construction and maintenance and the ability to site future circuits for network expansion and reinforcement are important factors in determining the specific requirements of the configuration of not only the switching station but also the overall Project. In the switching station selection process, consistent with the statutory provisions, ATC initially evaluated existing electrical substation locations within the Shawano to Clintonville study area. WIS. STAT. § 1.12(6)(2003). New locations (which do not contain a substation) were added for proposed and future potential routing of additional transmission circuits. The following criteria was used to consider new sites:

- Property already owned by ATC or under an option to purchase;
- Other property available to ATC through voluntary purchase;
- Sites on which the switching station could be constructed with minor or no environmental impact;
- Property size large enough for initial development (12+ acres) plus suitable additional buffer; and
- Location that provides opportunity for expansion of the switching station for future 138 kV electrical system support services (i.e., 345 kV to 138 kV transformation) and potential for future additional electrical interconnection of new 345 and 138 kV transmission lines.

The study areas and transmission line corridors were examined using:

- Current aerial photography with sensitivities noted;

- A map of potential switching station sites overlain with parcel information;
- Comment forms with potential willing sellers;
- In person meetings with potential sellers; and
- Digital terrain models with 2.5' - 5' elevation accuracy.

American Transmission Company reviewed public comments obtained during Phase I and used this information to begin its process of route identification. This preliminary input was also used to prepare maps for a second series of Open Houses. ATC conducted the Phase II Open Houses in late March and early April 2004. The objectives of this second series of Open Houses were to: (1) present the macro-analysis corridors and potential Central Wisconsin Switching Station sites; and (2) solicit public comment to further validate the data previously obtained and the further qualification of the preliminary study corridors. Interactive GIS technology was incorporated into this series of Open Houses as a means of incorporating comments and public input, generating site-specific maps linking comments received and information relating to specific parcels, and identifying spatial relationships among sensitivities. Incorporating comments and public input was done interactively by linking comments to a precise point, area, or linear feature and attributing that element with the specific comment. ATC also prepared and provided location-specific maps for public participants that tied the regional perspective specifically back to their individual property. Utilizing interactive GIS that incorporated specific public comment assisted in the development of the geospatial database information concerning the sensitivities associated with any particular transmission line route segment or corridor. The public comments specifically assisted in evaluating the route opportunities. Invitations for the Phase II Open Houses were sent to potentially affected landowners and residents within and immediately adjacent to the preliminary study corridors, interested stakeholders, and affected jurisdictions within the study area. The total number of invitations mailed was approximately 16,000. Over 2,400 people attended the Phase II Open Houses, which were held in four locations throughout the study area.

Phase III – Preliminary Routes. Following the Phase II Open Houses, the macro-analysis 2000-foot corridors were comparatively analyzed.

This included the determination of the occurrence of the environmental routing criteria within each corridor. The preliminary study corridors were prioritized, or qualified, based on the occurrence of sensitivities within each study corridor when compared to the nearest corridor of similar orientation. Preliminary planning and engineering were incorporated into the analysis, in addition to the public comments obtained during Phase II. A number of public comments suggested the use of existing ROWs instead of the development of new ROWs, which is consistent with the statutory prioritization and also the preeminence of the existing transmission line and primary transportation corridors within the study area.

The impact of the proposed transmission lines on each environmental routing criterion was assessed as a percent value relative to the area within each corridor segment. A percent value allowed the occurrence of sensitivities to be defined relative to the analysis area specific to each corridor segment, providing a spatial perspective to the qualitative comparison. For example, a corridor segment only one mile in length could not be equally compared to the nearest corridor segment providing the same general function and directional orientation, but three times greater in length. An occurrence of 50 acres associated with the shorter segment (21%) is more significant than 50 acres associated with the longer segment (7%). These percent values were then compared, independent of one another and without any weighted value, for corridor segments of similar length and orientation. Those corridors having a greater number of higher percent values of sensitivities were categorized as low priority, or low quality, and considered for elimination from further consideration. Those corridors having a lesser number of higher percent values of sensitivities were categorized as high priority, or high quality, and included for further consideration. Corridors with little difference in percent values for each criterion were categorized as medium priority, or medium quality, and a candidate for further evaluation. The siting requirements of the State energy policy were incorporated into this analysis as the primary consideration. *See* WIS. STAT. § 1.12(6)(2003). Appendix I, Figure 5 depicts the high, medium, and low priority, corridors and Appendix I, Table 1 provides the comparative analysis.

The low quality macro-analysis corridors were then removed from consideration. Appendix I, Table 2 provides the validation of the removal of these corridors. The medium and high quality macro-analysis corridors were retained, and the evaluation area reduced to a narrower width for

further analysis, as shown on Appendix I, Tables 3, 4, 5, and 6. The narrowed corridors were used in Phase III of the routing study and public process. Pedestrian field reconnaissance continued, in addition to ongoing spatial data acquisition. Extensive field reconnaissance assisted in the ongoing validation of data within the geospatial database. Existing transmission line corridors, secondary road corridors, and new corridors were reduced to an area encompassing 300 feet on either side of centerline. Divided highway corridors were reduced to an area 450 feet on either side of centerline. Pipelines and railroad corridors were reduced to an area 360 feet on either side of centerline. These widths provided an area in which linear features could parallel one another but still allow some additional area on either side of the existing linear feature for analysis. Typically more corridor sharing can be achieved by paralleling an existing transmission line than by paralleling a divided highway, therefore, the narrowed corridor width would be less. This overall reduction in the study area was used to develop preliminary transmission line routes for the Gardner Park – Central Wisconsin Project.

Percent values of sensitivities found on the narrowed corridors or preliminary routes were compared, and that comparison is set forth in Appendix I, Table 7. These values were then compared to the values that had been identified for corridor segments 2000 feet in width to determine the frequency of sensitivities occurring nearer to the centerline. Additional route location opportunities were also identified (See Appendix I, Table 8), often as a result of public input. These opportunities were added to the route opportunities under consideration in the development of preliminary routes, shown on Appendix I, Figure 6.

The potential locations Central Wisconsin Switching Station sites were also further reduced at this time. Criteria related to land acquisition, expansion potential, and system interconnectivity were incorporated into the comparison of opportunity areas that were still provided by the reduced number of narrowed corridors, or preliminary routes.

American Transmission Company conducted a third series of Open Houses in mid-November 2004. The objectives of the Phase III Open Houses were to: (1) present the narrowed corridors/preliminary routes and potential Central Wisconsin Switching Station sites (i.e., Appendix I, Figure 6); and (2) solicit public comment to further validate the data gathered and the qualification of the preliminary routes. Interactive GIS technology was again used in this series of Open Houses. Invitations for

the Phase III Open Houses were sent to potentially affected landowners and residents within and immediately adjacent to the preliminary routes, interested stakeholders, and affected jurisdictions within the study area. ATC mailed approximately 16,500 invitations. Over 1,300 people attended the Phase III Open Houses, which were held in five locations throughout the study area.

Phase IV – Proposed and Alternate Routes. The preliminary routes were analyzed and further qualified subsequent to the Phase III Open Houses. Public comments were again reviewed and the use of existing disturbed corridors remained a frequent comment as well as other comments specific to the environmental routing criteria and site-specific construction constraints. Additionally, other routing criteria were incorporated such as cost, design and engineering, ROW acquisition, major road crossings, tree clearing, density of transmission structures within confined areas, and construction access.

American Transmission Company removed from consideration those preliminary route segments that provided only secondary connection between two predominant routes that followed existing utility or transportation ROW. The removal of these segments was validated by the qualification of comparable route segments providing the same directional orientation, as shown on Appendix I, Table 9. Percent values for each environmental routing criterion relative to the area associated with each remaining route segment were again independently compared on Appendix I, Table 10. The primary determining factor of this comparison was again the statutory prioritization of the preliminary routes.

By this stage in the analysis, preliminary route segments were more equivalent regarding the potential impact to sensitivities. The analysis area had been reduced to a specific route. Those route segments having an overall higher statutory prioritization, fewer higher percent values of sensitivities, and lesser impacts related to the other routing criteria became the Proposed Route. The Alternate Route is the remaining combination of preliminary route segments having a lower statutory prioritization, relatively higher number of percent values, and higher impacts associated with the other routing criteria. Other segment alternatives were identified to maintain the flexibility for interconnection with any future or proposed switching station site, and to provide the Commission and WDNR more complete information regarding the routes

examined. Appendix A, Figure 1 depicts the Proposed and Alternate routes.

Phase IV concluded the routing study and public process by presenting the Proposed and Alternate routes that had been developed. ATC conducted a fourth series of Open Houses in late February and early March 2005. Invitations, including a project map, for the Phase IV Open Houses were sent to potentially affected landowners and residents within 300 feet of the required ROW of the Proposed and Alternate routes, interested stakeholders, and affected jurisdictions within the study area. ATC mailed approximately 2,400 invitations to landowners, residents, and public officials. Other people on the mailing list for the two projects (approximately 13,000 addresses) were sent a post card briefly summarizing the status of the projects. In total, 604 people, including 78 public officials, attended the fourth set of Open Houses; any comments ATC received are compiled in Appendix F-2.

5.02.4 Route Corridor Alternatives

Opportunities, study corridors, and preliminary routes have been identified, evaluated, and removed from consideration at various tiers of qualitative analysis throughout the routing study and public process. Section 5.02.3 provides a more detailed description of this overall process. At each phase of analysis, the routes and segment alternatives included within this Application continued to emerge as the appropriate locations, in accordance with permitting requirements and environmental and engineering considerations. However, to determine the Proposed Route, a more localized quantitative and cumulative comparison was conducted. Environmental impacts, within the required ROW, related to the human and natural environment were assessed. Appendix J, Tables 1 and 2 provide the environmental impacts by segment. Additionally, cost, design and engineering, ROW acquisition, and access were also evaluated.

These additional factors were necessary in determining the Proposed Route due to the relatively comparable occurrence of sensitivities within the study area of each route segment. The analysis area included a transmission line route-specific easement. Those route segments having a higher statutory prioritization; a lesser effect on the human environment, which would include existing residences, outbuildings, and various land uses; reduced impacts to the natural environment, such as

wetlands, waterways, and forested areas; and reduced impacts associated with the additional comparison factors were identified as the Proposed Route. The Alternate Route is the secondary combination of route segments having a lower statutory prioritization, a greater effect on the human environment, increased impacts to the natural environment, and increased impacts associated with the additional comparison factors.

The Proposed Route (N152-N104-N2-N3-N8-N151-N9-N55-N59-N66) would utilize existing transmission line corridors for its entire length, approximately 52 miles. Additional ROW is minimal because the proposed double-circuit 345/138 kV transmission line would be rebuilt on the same centerline as the existing single-circuit 115 kV line. There are also no significant site-specific design and engineering constraints. The Proposed Route is shorter in length and less costly than the Alternate Route. Cumulatively, there are 289 existing structures within 300 feet of the proposed centerline. The Proposed Route would cross approximately 101 acres of wetlands identified by the WWI and permanently impact approximately 0.10 acres of field-delineated wetlands/off-site delineated wetlands. (Details on wetlands impacts are set forth in Section 3.01 of the WDNR Utility Permit Application, attached as Appendix E-1, and the EITs, attached as Appendix E-2 to this Application.) Approximately 133 acres of forested lands and 604 acres of agricultural use lands would be crossed, based on the general land use designations as acquired from the affected jurisdictions within the study area. Appendix J, Table 3 provides the summary of sensitivity impacts associated with the Proposed Route. These occurrences of the environmental routing criteria, within the ROW, are counterbalanced by their previously disturbed nature and the high priority of existing utility corridors under the energy policy statute. WIS. STAT. § 1.12(6)(2003). Impacts to the human and natural environment have already been taken into account and any additional impacts as a result of the construction of the proposed transmission line would not be significant.

The Alternate Route (N152-N104-N2-N3-N8-N45-N62-N66), 61 miles in length, is located within an existing transmission line ROW from the Gardner Park Substation (N152) to STH 29 (along the existing A-313 transmission line corridor), then along the south side of STH 29 to N62 in the Shawano area. The Alternate Route then follows an existing transmission line corridor to the Proposed Central Wisconsin Switching Station site (N66). The Proposed and Alternate routes share the same route from N152-N104-N2-N3-N8 along the existing transmission line

ROW. Cumulatively, there are 473 existing structures within 300 feet of the Alternate Route centerline. The Alternate Route would cross 94 acres of wetlands identified by the WWI and permanently impact approximately 0.14 acres of field-delineated wetlands. (Details on wetlands impacts are set forth in Section 3.01 of the WDNR Utility Permit Application, attached as Appendix E-1, and the EITs, attached as Appendix E-2 to this Application.) Approximately 61 acres of forested lands and 325 acres of agricultural use lands would be crossed, based on the general land use designations as acquired from the affected jurisdictions within the study area. Appendix J, Table 3 provides the summary of impacts associated with the Alternate Route. These occurrences of the environmental routing criteria, within the ROW, are counterbalanced by their previously disturbed nature and the high priority of existing utility corridors under the energy policy statute. WIS. STAT. § 1.12(6)(2003). Impacts to the human and natural environment have already been taken into account and any additional impacts as a result of the construction of the transmission line would not be significant.

Three other segments that are not included in the Proposed or Alternate routes that could be used if necessary to modify a route are described below:

N104-N9 (7.4 miles) is predominantly a 120-foot-wide new ROW that provides an alternative route between the Gardner Park Substation and the Proposed Route.

N3-N151 (2.1 miles) is a 120-foot-wide new ROW providing an alternative from N3 to the J-36 ROW.

N45-N59 (5.4 miles) is a 45-foot-wide new ROW along Spruce Road that provides a crossover between the Proposed and Alternate routes.

5.02.5 Meetings with Agency Staff

In accordance with permit procedure for utility facilities, ATC held a number of meetings with Commission staff and WDNR staff to review the Project need, Project area, transmission line routing and switching station siting opportunities. WIS. STAT. § 30.025(1b)(2003). These meetings included review of preliminary maps of the Project area, as well as other discussions to identify Project area sensitivities including possible environmental impacts of the Project. ATC found three suitable sites that

have minimal or no environmental impacts, are constructible, are able to serve ATC's potential future needs, and are all under option to purchase or owned in fee.

American Transmission Company has also consulted with the Wisconsin Department of Transportation (WisDOT), for the routes along STH 29. Several meetings were held to develop a mutually agreeable use of highway ROW, as well as to consider future highway plans. WisDOT's concerns in sharing a highway corridor with a transmission line include traffic safety and accommodation of future highway improvements. WisDOT has proposed using some of the fiber optic capacity in ATC's OPGW for WisDOT purposes as compensation for the use of the WisDOT right-of-way.

5.02.6 Meetings with Stakeholders and Landowners

Public Involvement Process. Public involvement is an important part of the transmission line siting process. Stakeholder involvement early in the process, when specific construction plans have not yet been formulated, increases the likelihood that transmission line projects, when constructed, are more reasonable and acceptable to those most likely to be affected.

As described above, ATC conducted four sets of public information Open Houses, supported by a media outreach and thousands of mailed invitations. The comments received at the Open Houses are compiled in Appendix F-2.

Resolutions Regarding the Project. ATC received resolutions from eight different governmental bodies. All resolutions expressed an understanding and appreciation of the need for the Gardner Park – Central Wisconsin 345 kV Transmission Line, seven of the eight resolutions (Shawano County, Town of Pella, Town of Herman, Town of Germania, Town of Bevent, Town of Wittenberg, Village of Kronenwetter) were offered in support of the Project. They generally value the environment, cherish the natural landscape, and expressed their view that the route not go on new corridors or recreation trails but utilize existing corridors to the extent possible. One of the eight resolutions (Village of Eland) explicitly requests that the transmission line route avoid the Mountain Bay Recreational Trail.

5.03 GENERAL TRANSMISSION LINE SITING INFORMATION

The Proposed Route and Alternate Route are described below. Also described for the Commission's information are other connecting and alternative segments that are not part of ATC's proposal. The maps provided in Appendix A, Figure 1 identify the Proposed and Alternate routes.

Proposed Route (~52 miles). The Proposed Route for the new 345 kV line would be constructed double-circuit with the 345 kV Weston 4 Generator tie line within the existing Weston Power Plant site on a 120-foot-wide ROW for approximately 1 mile north out of the Gardner Park Substation (Segment N104-N2). At this point, the two circuits diverge, with the new Gardner Park – Central Wisconsin 345 kV Transmission Line continuing north as a single-circuit line and entering the existing 250-foot-wide corridor on the west side of USH 51 (Business). The new line would then continue east on the space currently occupied by the de-energized H-frame line (formally J-36). ATC plans to locate the centerline of the transmission line five feet south of the existing abandoned centerline. The structure will be double-circuited with the new 345 kV line on the south side of the pole and the existing Line A-313 will be rebuilt on the north side of the pole to minimize line crossings within the Weston site and out on the transmission corridor (N2-N3). The existing A-313 structures along this segment will be abandoned in place. The transmission corridor narrows to 200 feet wide when the Line T-20 turns south to the Rocky Run Substation. At this point the transmission line would be located on a double-circuit structures (with only one side installed initially) 75 feet south of the existing A-313/F-110 lines. When Line F-110 turns north, the corridor narrows to 150 feet (N3-N8). The existing A-313 H-frame structures will be removed, and the line will be rebuilt on the same centerline with new double-circuit structures (345 kV circuit on the south and the A-313 circuit on the north). When the 345 kV line reaches the end of segment N3-N8, it intersects the J-36 line. It will then follow the existing J-36 centerline all the way to the Central Wisconsin Switching Station located adjacent to the exiting Badger Substation (N8-N9-N55-N59-N66). The existing J-36 line will be rebuilt on the same new double-circuit single-pole structures as the proposed 345 kV line.

Alternate Route (~61 miles). The Alternate Route for the proposed new 345 kV line would be constructed double-circuit with the 345 kV Weston 4 tie line within the existing Weston plant site on a 120-foot ROW for approximately 1 mile north out of the Gardner Park Substation (Segment N104-N2). At this point, the two circuits diverge, with the new Gardner Park

– Central Wisconsin 345 kV Transmission Line continuing north as a single-circuit line and entering the existing 250-foot-wide corridor on the west side of USH 51 (Business). The new line would then continue east on the space currently occupied by the de-energized H-frame line (formally J-36). ATC plans to locate the centerline of the transmission line 5 feet south of the existing abandoned centerline. The structure will be double-circuited with the new 345 kV line on the south side of the pole, and the existing A-313 line will be rebuilt on the north side of the pole to minimize line crossings within the Weston site and out on the transmission corridor (N2-N3). The existing A-313 structures along this segment will be abandoned in place. The transmission corridor narrows to 200 feet when line T-20 turns south to the Rocky Run Substation. At this point the transmission line would be located on a double-circuit structures (with only one side installed initially) 75 feet south of the existing A-313/F-110 lines. When the F-110 line turns north towards Kelly Substation, the corridor narrows to 150 feet (N3-N8). The existing A-313 H-frame structures will be removed, and the line will be rebuilt on the same centerline with new double-circuit structures (345 kV circuit on the south and the A-313 circuit on the north). The existing A-313 conductor will be transferred to the new structures. This would continue until the lines intersect with STH 29. At this point, the A-313 circuit will continue northeast to Blackbrook Substation, and the 345 kV line will head east on the south side of the STH 29 ROW to an existing line KK86504 located in Shawano (N62). The STH 29 ROW is irregular in width all along the alignment. The route maximizes the utilization of the highway ROW and minimizes the need for easements from private landowners. From the intersection with line KK86504 (node N62), the line would connect to the proposed switching station site (N66) via an existing transmission line corridor. The existing 138 kV circuit would be relocated to the same double-circuit single-pole structures as the new 345 kV circuit.

Other segments and sites. There are three segments (N104-N9, N3-N151, and N45-N59) that can also be used to route between the Gardner Park Substation and Central Wisconsin Switching Station. They are all corridors that are of the lowest priority according to the energy policy statute. WIS. STAT. § 1.12(6)(2003). There are also two alternative switching station sites for Central Wisconsin (N55 and N62).

Detailed maps that provide the location of the line route alternatives, switching station locations, topographic maps, aerial photos with WWI data, zoning, land use, and floodplain maps are provided in Appendix A.

5.04 DETAILED ROUTE INFORMATION

5.04.1 General Route Impacts

5.04.1.A New Right-of-Way

Line segments located totally on private property will require new 120-foot-wide easements. For segments where the proposed line segment is adjacent to road ROW (other than STH 29, discussed under Section 5.04.1.C below), the transmission poles would be located on private property approximately five (5) feet outside of the road right-of-way, reducing the required new easement from private property owners to approximately 45 feet. Typical cross-sections are presented in the figures in Appendix C.

Specific details of segments in which no current utility or transportation corridor currently exists are as follows (the segment endpoints refer to the node numbers shown in Appendix A, Figure 1):

- **N104-N9 (7.4 miles)** (not part of Proposed or Alternate Route) is predominantly a 120-foot new ROW that provides an alternative connection between the Gardner Park Substation and the Proposed Route. ATC would build single-circuit steel single pole structures.

- **N3-N151 (2.1 miles)** (not part of Proposed or Alternate Route) is a 120-foot-wide new ROW providing an alternative connection from node N3 to the J-36 ROW. ATC would build single-circuit steel single pole structures.

5.04.1.B Existing Right-of-Way

Overview:

Many of the line segments in this Application follow or overlap existing transmission line rights-of-way. ATC will obtain revised easement rights for the Project; these easements will conform to the requirements of Wisconsin law on transmission line rights-of-way. WIS. STAT. § 182.017(2003). For the most part, and where possible, the proposed route follows the centerline of existing transmission lines to minimize new impacts to properties. Some easement widths may have to be expanded to accommodate the upgraded facilities.

Specific details of segments that incorporate or overlap existing utility rights-of-way are as follows (the segment endpoints refer to the node numbers shown in Appendix A, Figure 1):

- **N152-N104 (0.1 miles)** (Proposed and Alternate routes) is a 120-foot-wide ROW exiting the substation due south and east on ATC substation property.

- **N104-N2 (1.3 miles)** (Proposed and Alternate routes) is a 120-foot-wide ROW located on lands owned by WPSC (Weston site). WPSC will grant ATC the necessary rights to operate the line on WPSC's property.

- **N2-N3 (2.5 miles)** (Proposed and Alternate routes) runs along an existing 250-foot-wide transmission line ROW occupied by three sets of existing transmission line structures, to a point where existing line T-20 turns south. The existing northerly structure is a double-circuit steel pole structure supporting two 115 kV lines (F-110 and T-20).[†] The middle structure has an out-of-service transmission line on a wood H-frame structure. The southerly structure is a wood H-frame structure supporting a 115 kV line (A-313). ATC proposes to replace the out-of-service transmission line with new 345 kV double-circuit steel single pole structures that would support the new 345 kV circuit and the A-313 circuit on this existing ROW. This will be done to minimize line crossings at the Weston Power Plant site and further east on the Proposed Route. The existing A-313 structures will be left in place. From this point to N-3, the ROW narrows to 200 feet. ATC proposes the construction of new 345 kV double-circuit steel single pole structures with only one circuit installed on this existing ROW. The A-313 circuit would be transferred to the vacant circuit on these poles when it is converted to 345 kV operation in the future.

- **N3-N8 (2.5 miles)** (Proposed and Alternate routes) is, from N3 to a point where line F-110 turns north, a 200-foot-wide existing transmission line ROW occupied by a double-circuit 115 kV line (F110 and A313) on double-circuit steel single poles. Parts of the

[†] Line references such as "A-313" refer to the general designation that ATC uses to identify the transmission lines that comprise its transmission system.

out-of-service H-frame line are located on the centerline of the southeasterly side of this corridor. ATC proposes to remove and replace the southerly out-of-service H-frame facilities with new 345 kV double-circuit steel single pole structures 75 feet south of the existing 115 kV line. From this point to N8 is a 150–foot-wide existing transmission line ROW containing circuits designed for 345 kV (operated at 115 kV) supported by wood H-frame structures. ATC proposes replacing the existing H-frame structures with 345 kV double-circuit steel single pole structures that would support the existing 115 kV line (A-313) along with the new 345 kV line on the existing ROW.

- **N8-N151 (1.1 miles)** (Proposed Route) is a 100-foot-wide existing transmission line ROW occupied by a single-circuit 115 kV line (J-36) on H-frame structures. ATC proposes to rebuild the existing transmission line H-frame structures with new 345 kV double-circuit single pole structures that would support the existing 115 kV line along with the new 345 kV line on the existing ROW.

- **N151-N9 (0.1 miles)** (Proposed Route) is a 100-foot-wide existing transmission line ROW occupied by a single-circuit 115 kV line (J-36) on H-frame structures. ATC proposes to rebuild the existing transmission line H-frame structures with new 345 kV double-circuit single pole structures that would support the existing 115 kV line along with the new 345 kV line on the existing ROW.

- **N9-N55 (41.7 miles)** (Proposed Route) is a 100-foot-wide existing transmission line ROW occupied by a single-circuit 115 kV line (J-36) on H-frame structures. ATC proposes to rebuild the existing transmission line H-frame structures with new 345 kV double-circuit single pole structures that would support the existing 115 kV line along with the new 345 kV line on the existing ROW.

- **N55-N59 (1.2 miles)** (Proposed Route) is a 100-foot-wide existing transmission line ROW occupied by a single-circuit 115 kV line (J-36) on H-frame structures. ATC proposes to rebuild the existing transmission line H-frame structures with new 345 kV double-circuit single pole structures that would support the existing 115 kV line along with the new 345 kV line on the existing ROW.

- **N59-N66 (1.7 miles)** (Proposed Route) is a 100-foot-wide existing transmission line ROW occupied by a single-circuit 115 kV line (J-36) on H-frame structures. ATC proposes to rebuild the existing transmission line H-frame structures with new 345 kV double-circuit single pole structures that would support the existing 115 kV line along with the new 345 kV line on the existing ROW.

- **N62-N66 (4.7 miles)** (Alternate Route) is an existing 60-foot transmission line ROW for the 138 kV line designated KK86504 to where it intersects STH 22. ATC proposes to rebuild this portion with 345 kV double-circuit steel single pole structures on the existing ROW plus an additional 60 feet of new ROW. From this point the line would parallel STH 22 on the existing 32 feet of ROW to the Proposed Central Wisconsin Switching Station. ATC proposes to rebuild this portion as 345 kV circuit toward the highway on the existing ROW plus an additional 13 feet of new ROW.

5.04.1.C Corridor Sharing

A substantial portion of the Alternate Route would be located in or along the STH 29 ROW. ATC worked with the WisDOT in an effort to locate as much of the line as possible — consistent with safe motor travel and future highway plans — within the WisDOT ROW. There are locations where ATC would need to acquire private property adjacent to the ROW.

Specific details of segments that share transportation corridors are as follows (the segment endpoints refer to the node numbers shown in Appendix A, Figure 1):

- **N8-N45 (44 miles)** (Alternate Route) is a 150-foot-wide existing transmission line ROW (A-313) occupied by wood H-frame structures from N8 to STH 29, where A-313 continues north. ATC proposes to remove the existing H-Frame structures and replace them with 345 kV double-circuit steel single pole structures utilizing the existing ROW. From this point east along the south side of STH 29 to N45, a nominal 50-foot-wide new ROW located adjacent to and co-located with the existing STH 29 ROW. ATC proposes to build 345 kV single-circuit steel single pole structures with conductors on the road side of the structure. The existing STH 29 ROW is irregular in width. The route maximizes the utilization of

the highway ROW and minimizes the need for ROW acquisition on privately owned lands.

- **N45-N62 (5.5 miles)** (Alternate Route) is a nominal 50-foot-wide new ROW located adjacent to and co-located on the south side with the existing STH 29 ROW. ATC proposes to build 345 kV single-circuit steel single pole structures with conductors on the road side of the structure.

- **N45-N59 (5.4 miles)** (not part of the Proposed or Alternate Route) is a 45-foot-wide new ROW located adjacent to Spruce Road. ATC would build 345 kV single-circuit steel single pole structures with conductors on the road side of the structure.

5.04.1.D Land Use and Zoning

Land use and zoning data was obtained from the affected jurisdictions along the route segments and segment alternatives included in this Application. Appendix J, Table 1 provides the impacts associated with agricultural and forest land uses, and commercial/industrial zoning areas for each segment.

5.04.1.E Buildings

Field inventories were conducted to determine the number of existing buildings, both occupied and unoccupied, within immediate proximity of the Proposed and Alternate routes and segment alternatives. Routes and segment alternatives adjacent to or within an existing public ROW and where access to private property could be obtained, were field surveyed inventoried. Field inventories, supplemental to initial field reconnaissance effort, concluded in January 2005. Interpretation of the November 2004 aerial photography was completed for all segments. Appendix J, Table 2 provides the number of buildings that may be impacted by the Proposed or Alternate routes, or by the other segment alternatives.

5.04.2 Impacts by Land Type

The Proposed and Alternate routes and other segment alternatives impact a variety of land types. Acreages traversed include the occurrence of any land type within the required ROW specific to each segment; however, the amounts identified overstate the impact on each land type because

the actual impact will be limited to direct impacts at pole locations. Site-specific wetland and waterway impacts are discussed in detail in the WDNR Utility Permit Application, included in Appendix E-1. Furthermore, required tree clearing along existing ROWs is overstated in Appendix J, Tables 1 and 3, because the information provided is more inclusive due to the broadly encompassing nature of the land use designations.

5.04.2.A Agricultural

Acres of agricultural use lands traversed by each route segment and segment alternative is provided in Appendix J, Table 1.

5.04.2.B Forested Lands

Acres of forested lands traversed by each route segment and segment alternative is provided in Appendix J, Table 1.

5.04.2.C Wetlands

The acres and linear distance of WWI wetlands traversed by each route segment and segment alternative is provided in Appendix J, Table 1.

5.04.2.D Publicly Owned Land

The route segments and segment alternatives traverse publicly owned lands. The following sections identify impacts related to specific categories of publicly owned lands.

5.04.2.E County Land

The Proposed Route does not cross County-owned property. The Alternate Route (segment N8-N45) would traverse approximately 0.5 miles, (approximately 3.0 acres in area) of land owned by Marathon County, not including highway crossings. In addition, the Alternate Route (segment N8-N45) would traverse less than 0.5 miles of land (a fraction of an acre) owned by Shawano County, not including highway crossings.

5.04.2.F State Properties

A segment of the Proposed Route (N9-N55) would traverse less than a half mile of lands administered by the WDNR. The Alternate Route would traverse less than a half mile of lands administered by WDNR

between nodes 8 and 45. Along STH 29, the WisDOT ROW will be utilized to the maximum extent allowable for the construction of the Alternate Route. Along STH 22, additional ROW would be acquired adjacent to existing ROW. Conductors and shield wires would extend over the existing WisDOT ROW.

5.04.2.G Federal Land

No federal lands would be directly impacted or traversed by any route segment or segment alternative.

5.04.2.H Native American Indian Reservations

No Native American lands would be directly impacted or traversed by any route segment or segment alternative.

5.04.2.I Residential Land

The Proposed Route would traverse approximately 0.3 miles, or 5.4 acres, of residential use lands, as designated by the general land use designations acquired from the affected jurisdictions within the study area. The Alternate Route would traverse approximately 0.7 miles, or 4.1 acres, of residential use lands. Other segment alternatives would traverse approximately 0.7 miles, or 5.7 acres, of residential use lands.

5.04.2.J Commercial/Industrial Land

Commercial/industrial zoned lands traversed by each route segment and segment alternative are provided in Appendix J, Table 1.

5.04.3 Route Summary Table

Route summaries associated with land use impacts, and categorical distances of occupied and unoccupied buildings from the centerline of the Proposed Route, Alternate Route, and other segment alternatives are discussed Appendix J, Tables 1 and 3.

5.04.4 Agricultural Segment and Route Summaries

Agricultural land use impacts associated with the Proposed Route, Alternate Route, and other segment alternatives are provided in Appendix J, Tables 1 and 3.

5.04.4.A Type of Farming

Agricultural areas are primarily rotational row crops, including corn, soybeans, wheat, potatoes, pasture, and fallow land, as well as some dairy farming.

5.04.4.B Practices Potentially Affected

Several center-pivot irrigation systems have been noted along the Line J-36 corridor. If this route is selected, ATC will coordinate the placement of structures to avoid impacting these systems. If impacts are unavoidable, ATC will work with the landowner to provide for irrigation system modifications.

The Department of Agriculture, Trade and Consumer Protection (DATCP) has requested ATC address biosecurity, or farm disease mitigation, during the construction of transmission lines. Emphasis has been placed on the location of the plant parasite soybean cyst nematode (SCN) and livestock diseases. Also of concern is the potential impact to organic farm production. The broad category of impact is business impacts to organic or other farms due to spreading of contaminated soils. For organic farming herbicides/pesticides become a contaminant.

Although DATCP has no specific regulations that require ATC to conduct farm disease mitigation, DATCP recommends that special construction considerations for farm disease mitigation be implemented and that these special construction considerations may include removal of manure, organic material, and soil from the tires of work equipment if the equipment crosses land with livestock or specific crops, such as soybeans or organics. This could include the use of cleaning stations (both dry and high-pressure washing).

American Transmission Company will work with potentially affected agricultural landowners to ensure that farm disease mitigation currently practiced will be adhered to during the construction aspects of ATC's transmission line work. If an agricultural landowner has no such practices in place, ATC will work with the landowner to develop farm disease mitigation practices for the particular type of agricultural operation, if requested by that landowner. Farm disease mitigation specialists will be retained by ATC to assist in the development of any necessary practices.

Costs associated with farm disease mitigation vary. The most simple, and least expensive, method to minimize the potential for impact could be to isolate the property within the proposed easement and remove it from agricultural production through the period of construction activity. Compensation could be offered to the agricultural landowner for not producing a crop or spreading manure. Other options include the use of cleaning stations. Dry cleaning stations are estimated at approximately $9,000 per station. High-pressure washing stations are estimated to cost approximately $25,000 to $65,000 per station with additional costs associated with the assembly and set-up to move these stations to new locations as construction progresses. The need for and location of the cleaning stations would be determined during discussions with each landowner.

Soybean cyst nematode has been documented in Outagamie and Waupaca counties but not in Marathon or Shawano counties.* Soil samples can be obtained for fields in soybean production and analyzed for a relatively inexpensive cost, if necessary.

In summary, if the Commission grants this Application, ATC will work with the agricultural producers on the ordered routes to follow farm disease mitigation practices currently in place to minimize the potential for agricultural impacts.

5.04.4.C Distances from Outbuildings

Categorical distances of outbuildings associated with the Proposed Route, Alternate Route, and other segment alternatives are provided in Appendix J, Table 3. Outbuildings, which include garages, sheds, barns, silos, and other unoccupied buildings not identified as a residence or business operation, are generally categorized under farming operations.

5.04.4.D Farmland Preservation Program Properties

Electrical transmission lines and related incidental structures on lands under farmland preservation agreements are "use[s] consistent with agricultural use." WIS. STAT. § 91.13(8)(c)(2003). Farmland preservation programs include, but are not limited to, the Crop Reserve

* Source: DATCP, Cooperative Pest Survey Program and A. MacGuidwin, UW-Madison, 2003.

Program and the Managed Forest Land Program (MFL). *See* WIS. STAT. Ch. 77 (2003). The MFL replaced the Woodland Tax Law and the Forest Crop Law in 1986, but these two programs can still be in effect until the present agreements under such programs expire by their terms. Upon determination of the appropriate route by the Commission, ATC will work with landowners who have land entered in these programs and will assume all responsibility and cost associated with any modifications or changes to agreements necessitated by any new easement on property with such agreements that involve the placement of utility structures.

5.04.5 Forest Land Segment and Route Summaries

Impacts to forested lands, as identified within the land use designations, are summarized in Appendix J, Table 3 for the Proposed Route, Alternate Route, and other segment alternatives.

5.04.6 Federal Conservation Segment and Route Summaries

American Transmission Company has contacted the United States Department of Agriculture, Natural Resource Conservation Service and has been advised that, based on a review of the USDA records available at the time, no properties in the Wetland Reserve Program would be affected by the Proposed or Alternate routes.

5.04.7 Protected Species

Please see the WDNR Utility Permit Application, Section 2.06, located in Appendix E-1, for a discussion of protected species.

5.04.8 Archaeological and Historic Resources

American Transmission Company has worked with Great Lakes Archaeological Research Center to develop information regarding the locations of known archaeological resources and historic sites in the Project area. Due to the sensitive nature of the subject matter, this material will be submitted to the Commission on a confidential basis shortly after filing this CPCN Application. After consultation with the Wisconsin Historical Society and Commission Staff, a qualified archaeologist will be retained for site-specific investigations, if required.

5.04.9 Nearby Airports

The location of all known airports and landing strips within the Project study area are shown on Figure 1 in Appendix A. Dillensburg's Airport (Dillenburg's Field), a privately-owned FAA-registered local landing strip, is at least a half mile west of Spruce Road (N45-N59). The landing strip associated with Dillenburg's Field appears to be in a parallel orientation to Spruce Road based on aerial interpretation. Bender's Airport (Bender's Field), a privately-owned FAA-registered local landing strip, is the closest airport or landing strip to any route segment or segment alternative. It is approximately 0.5 miles from the Proposed or Alternate Route (N2-N3). The landing strip associated with Bender's Field also appears to be orientated parallel to the Proposed or Alternate Route. The Central Wisconsin Airport is at least four miles southwest of any route segment or segment alternative. The Project will be constructed in accordance with FAA and WisDOT height restrictions and will not impact airport safety or operations.

5.04.10 Access Issues

Until specific routes are determined, the access to any particular segment cannot be fully determined. At this time, access routes have been developed in a manner that strives to avoid and minimize waterway and wetland impacts, and to accommodate required construction equipment. Much of the access for this Project will be from public roads and via overland travel along the existing transportation corridor. Some areas may not be readily accessible by traversing the ROW due to the presence of steep terrain, extensive wetlands, or waterways. ATC's access plan, provided in Appendix E-3, Figure 4, identifies existing fields, field roads, forest roads and/or trails on public and private land located outside of the ROW. If ATC or its contractor can obtain voluntary permission from landowners to utilize these and/or other potential access routes, impacts to sensitive areas will be minimized. If access for these potential routes cannot be obtained, additional wetland crossings, waterway crossings and/or the construction of new access trails/roads may be necessary. Landowner access and easement permission efforts for construction will be ongoing in an effort to minimize the crossing of waterways and wetlands and to accommodate construction equipment. The proposed location and methods of access shown on the access plan are subject to change based on field conditions and access agreements at the time of construction.

ATC's access plan is included in Appendix E-3, Figure 4. The following are included in the access plan for the Proposed Route, the Alternate Route, and the other segments:

- Figure 1 – Segment Location & Sheet Index;
- Figure 2 – Topography (with proposed access);
- Figure 3 – Orthophotography (with proposed pole locations); and
- Figure 4 – Access Plan (with existing and proposed pole locations, waterways, WWI, aerial and field delineated wetlands, soils, proposed temporary bridge locations, proposed access routes, etc.).

5.04.11 Waterway Permitting Activities

Due to the size and nature of the proposed construction and the natural landscape in the region, route construction will necessitate the placement of structures in wetlands and crossing a number of streams and rivers. ATC has applied to the WDNR for the permits necessary to construct the proposed transmission line facilities. WIS. STAT. §30.025(1s)(2003); see Appendix E-1. Structure placement in wetlands and stream crossings has been minimized, to the extent practicable, based on factors including structure height, topography, existing ROW, and other engineering requirements. For each route, waterways and wetlands are listed and briefly described in the EITs found in Appendix E-2 as well as in the Supplemental 3500 Tables included with the WDNR Utility Permit Application, and the corresponding Form 3500-53 materials required for the permits required from the WDNR and USACE. As indicated in the tables, each wetland and waterway within the proposed ROW for each route segment has been assigned a unique alpha-numeric number. The tables also provide additional information such as existing and/or proposed structures in wetlands and temporary wetland and stream crossing methods. Where topography, natural features, and access opportunities along the proposed ROW necessitate, some waterways will be crossed during construction activities utilizing temporary clear span bridges (TCSB). Existing roads, bridges, and culverts will be utilized wherever possible.

5.04.12 Wetlands and Wetland Crossings

Please see the WDNR Utility Permit Application, Section 3.01, located in Appendix E-1, for a discussion of impacts on wetlands and wetland crossings.

5.04.13 Mapping Wetland and Waterway Crossings

This information is included in ATC's access plan, Appendix E-3, Figure 4, described above in Section 5.04.10.

5.05 CONSTRUCTION METHODS

5.05.1 Type and Location of Structures

Descriptions of overhead transmission line construction procedures are discussed in Section 5.01.8.

5.05.2 Underground Construction Details

No underground transmission line construction is planned. Some distribution lines, communication lines, etc. may need to be relocated underground. Construction standards and procedures for the particular utility would apply in these situations.

5.05.3 Stream Crossings

Please see the WDNR Utility Permit Application, Section 2.04, located in Appendix E-1, for a discussion of waterway crossings.

5.05.4 Wetland Crossings

Please see the WDNR Utility Permit Application, Sections 2.01-2.03, located in Appendix E-1, for a discussion of wetland crossings.

5.05.5 Site Restoration and Monitoring

Please see the WDNR Utility Permit Application, Section 5.0, located in Appendix E-1, for a discussion of site restoration and monitoring.

5.05.6 Construction, Monitoring, and Restoration Schedules

Please see the WDNR Utility Permit Application, Sections 4.0 and 5.0, located in Appendix E-1, for a discussion of construction and monitoring. Specific restoration and monitoring schedules would be developed for each spread of construction.

5.05.7 Erosion Control Plan (sites greater than 1 acre)

American Transmission Company has applied for the Storm Water Discharge permits in its WDNR Utility Permit Application. WIS. STAT. § 30.025 (1s) (2003). Following the issuance of the Commission's order approving a transmission line route in this proceeding, ATC will provide WDNR with the necessary information to issue the required Storm Water Discharge permits within the 30-day period following the Commission's determination. A long-term stormwater plan for the transmission line portion of the Project is unnecessary because no new impervious area is proposed other than incidental concrete foundations at the structure locations.

5.05.7.A Methods and Materials

The WDNR's erosion control Best Management Practices (BMPs) will be applied at specific pole locations, as necessary. Silt fence will be installed on the down slope side of the work area for each structure foundation site where slope, vegetative cover, and/or the distance to a waterway or wetland is such that the potential for erosion and/or sedimentation impacts exist without such measures in place. Tracking pads will be installed and properly maintained at construction access points that lead off of paved roadways. At upland structure locations, excavated material will be regraded over the surrounding ground surface, or removed if requested by the landowner, and the area reseeded and/or mulched at the earliest suitable opportunity. Temporary piles of excavated material will be similarly treated, or surrounded with silt fences if more appropriate due to location or storage duration. Protective matting will be used to support heavy construction equipment in unstable soil areas. Excess soils will be removed and deposited in a landowner-approved upland location, and disturbed areas will be reseeded and/or mulched at the earliest suitable opportunity.

5.05.7.B Site Plan

An erosion control site plan for each of the three possible sites identified for the Central Wisconsin Switching Station is presented in Appendix H-4, Exhibits 1, 2, and 3. Following the issuance of the Commission's order approving a transmission line route in this proceeding, ATC will provide WDNR with the necessary information to issue the required Storm Water Discharge permits within the 30-day period following the Commission's determination.

5.05.7.C Sequence

Anticipated sequencing for the transmission line construction includes:

1) Surveying and Staking of ROW – Requires no erosion control measures;

2) Development of ROW Access – Vehicle tracking pads, silt fences, and other applicable erosion control measures will be installed as ROW access is gained. Because disturbance of the access path will be intermittent, seeding and mulching of the access path will be performed if the anticipated time interval between disturbance-causing activities is expected to be extended;

3) Temporary Staging and Materials Storage Areas – Staging and storage areas which are constructed and result in ground disturbance will have silt fences placed on the down slope side of the site. If access to the storage area is off a public road, a vehicle-tracking pad will be placed at the intersection;

4) Clearing of ROW – Erosion control measures will be in place down slope of the cleared areas where the ground will be disturbed during construction. Areas that will be cleared and further disturbed during the construction of the Project will be permanently restored (seeded and mulched or matted) after the completion of construction;

5) Structure Site Preparation – Erosion control measures will be installed down slope prior to structure site preparation. Because soil disturbance at structure locations will be intermittent throughout the construction of the Project, temporary restoration (seed and mulch) will be completed if the time interval between phases is extended;

6) Foundation Installation – See Structure Site Preparation description in subsection (5) above;

7) Materials Transportation – See Development of ROW Access description in subsection (2) above;

8) Structure Assembly and Erection – See Structure Site Preparation description in subsection (5) above;

9) Wire Stringing – Disturbance due to this construction activity will be similar to the disturbance at the structures although it will be less intrusive (no boring); the primary differences are that the number of wire stringing locations are less than the number of structures, the disturbance area per location is potentially larger, and the disturbance will occur only once (temporary). See Structure Site Preparation for description of erosion control approach in subsection (5) above; and

10) Cleanup and Restoration of ROW – Cleanup and permanent restoration will occur as soon as practicable following completion of the land-disturbing activities. Seed mixes used will be consistent with industry standards and regulatory requirements. Mulching and matting will be used as appropriate. Silt fences will remain in place until adequate vegetative cover is achieved.

The anticipated sequencing for the substations includes:

1) Establish vehicle tracking pad and perimeter controls (silt fences, earthen berms, etc.);

2) Clear and remove vegetation and roots, as needed;

3) Establish interior erosion control measures as site grading progresses;

4) Install drainage features, as site grading allows;

5) Complete site grading; and

6) Complete final site restoration including seeding, mulching, matting, and rip-rapping, etc.

5.05.7.D Off-site Diversion Methods

General offsite diversion methods are not applicable to this Project, as ATC is not planning to divert any water flow. Any construction site diversions will utilize BMPs based on WDNR's 2004 Conservation Practice Standards.

5.05.7.E Inspection and Maintenance

To insure compliance with regulations and project specific requirements, such as erosion control, qualified ATC staff or its representative will conduct construction inspections. Inspections will be completed after storms exceeding one inch in 24 hours in the construction area, based upon the nearest available National Oceanographic and Atmospheric Administration monitoring station, or once per week, whichever is more frequent. The erosion control inspector will supervise and direct maintenance needs of all erosion control measures. All erosion control issues identified by the inspector will be addressed within 48 hours (or sooner if the weather forecast predicts that a rainfall event will occur sooner). The erosion control inspector will have the authority to direct the installation of additional erosion control measures not initially identified in the erosion control plan, should conditions dictate the need for improved erosion control, and have the authority to stop work and take necessary corrective actions to prevent sedimentation.

Storm water management inspections will be completed by qualified ATC staff or its qualified representative, and will include:

1) Inspection of all culvert inlets and outlets to determine if the culvert is becoming unacceptably clogged with debris or sediment or if the inlet or outlet is permitting water runoff to scour the embankment;

2) Inspection of all drainage features to determine the presence of erosion or sediment accumulation;

3) Inspection of detention basins and outlets to ensure that they are functioning correctly and providing adequate sediment removal. If large amounts of sediment have accumulated in the detention basins, measures will be taken to remove the sediment and dispose of the material in an appropriate manner; and

4) Inspection of any infiltration practices to ensure they are functioning properly. If a rainfall event has not occurred in the last 72 hours, the infiltration practice should be dry. Also, vegetation (as planted per the restoration plan) should be present throughout the entire infiltration practice.

5.05.8 Materials Management Plan

American Transmission Company will manage all excavated soils, and construction equipment as described below. All management activities will meet the requirements of state law. *See* WIS. STAT. Ch. 30 (2003); WIS. ADMIN. CODE Ch. NR 216 (2004).

5.05.8.A Access Point Locations

Access to the transmission line ROW will be from existing roads, and will follow the transmission line ROW or negotiated access from private property owners. ATC and its contractor will strive to arrange for alternate access with landowners utilizing farm lanes and private roads to avoid impacts to sensitive areas. Potential access points will be managed as described in Appendix E-1.

5.05.8.B Haul Routes

Materials hauled to and from the construction locations will utilize existing roads or ROW, and/or arranged access locations where roadways are not present. Access will be managed as described in Appendix E-1.

5.05.8.C Stockpile Areas

During substation construction, some graded material may be temporarily stockpiled at the new Central Wisconsin Switching Station location. The location and amount of material of stockpiles is not known at this time. Stockpiled materials will be managed in such a manner to minimize impacts to water bodies, roads, and sensitive environments. Stockpiled materials will be managed as described above in Appendix E-1.

5.05.8.D Equipment

Construction materials stored on site generally consist of transmission line structures, cables, and substation equipment. Upon final route

selection, ATC will secure areas near the route to temporarily store transmission line construction materials. Substation materials will be delivered to the new switching station site and will likely be installed soon after delivery. None of the equipment has the potential to spill potential contaminants as all switching station equipment is shipped and installed prior to being filled with any fluids. No equipment storage areas will exist within wetlands or will be placed in an area that requires grading. Vegetation will not be removed to accommodate an equipment staging area unless specifically requested by the landowner.

American Transmission Company will require all contractors to have in place a spill prevention and control plan that addresses both the contractor's construction equipment and construction activities. This will include requiring on-site spill control kits.

5.05.8.E Field Screening for Contamination

It is unknown at this time if contaminated materials exist on site. If contaminated soil is encountered during the excavation for pole footings, appropriate measures will be taken to handle disposal properly.

5.05.8.F Contaminated Materials

A Phase I investigation has been prepared for the proposed Central Wisconsin Switching Station site; it identified no environmental hazards. It is unknown at this time if contaminated materials exist at any proposed or alternative switching station site or any proposed pole location. Upon final approval of a switching station site, ATC will conduct any Phase I Environmental Site Assessments needed on the alternative sites, and any necessary Phase II Site Investigations provided for in Section 5.05.8.E. If suspected contaminants are identified during line construction, ATC will handle the contaminated material in accordance with WDNR regulations.

5.05.8.G Excavation Methods

Transmission Line: Foundation installation will involve using augur equipment to excavate a circular hole of appropriate diameter and depth into on-site soils. Upland excavation material will be spread evenly around the structure base and stabilized (seeded and mulched) to

promote site drainage. Wetland excavation material will be temporarily placed onto mats before removal to a suitable upland site by truck.

Substations: Any excavations associated with substation construction will be conducted using standard construction equipment such as bulldozers and excavators. Excavated material will be spread evenly around the substation site to promote site drainage.

5.05.8.H Excavation Dewatering Methods

In stable soils, foundation excavations dewatering would occur as concrete is placed in the hole via a special concrete-pouring sleeve known as a tremie. Water encountered in excavations will be removed from excavated materials and either placed into tanker truck or empty concrete trucks and hauled away to a designated upland site or brought back to the concrete batch plant, as appropriate; or pumped to an appropriate nearby upland for de-siltation and infiltration.

5.05.8.I Estimated Volume of Excavated Materials

No excavation is anticipated to be required within any channels and the volume of excavated upland materials is dependent upon the specific route chosen, site characteristics such as topography, structure height and angle, soils, etc.

5.05.8.J Estimated Volume and Location of Re-used Materials

Estimated volumes of re-used material cannot be provided at this time. However, at upland structure locations, excavated material will be regraded over the surrounding ground surface, or removed if requested by the landowner; and the area reseeded and/or mulched at the earliest suitable opportunity. Temporary piles of excavated material will be similarly treated, or surrounded with silt fence if more appropriate due to location or storage duration. Excess soils will be removed and deposited in a landowner-approved upland location, and disturbed areas will be reseeded and/or mulched at the earliest suitable opportunity.

5.05.8.K Off-site Disposal Plans

Upon determination of the presence of contaminated materials, a plan for the transportation and disposal of contaminated materials will be developed. ATC will, if necessary, arrange for offsite disposal of contaminated materials or uncontaminated materials or dispersal

uncontaminated materials at an approved location. ATC will approve of the offsite disposal location prior to commencement of construction activities. No soils will be disposed of within wetland areas.

5.05.9 Dewatering Plan

Please see the WDNR Utility Permit Application, Section 3.03, located in Appendix E-1, for a discussion of ATC's dewatering plan.

5.06 SUBSTATION INFORMATION

5.06.1 Substation Layout

This Project includes modifications to transmission facilities at the Gardner Park Substation and the proposed Central Wisconsin Switching Station. A permanent name for the switching station will be chosen when a site has been ordered. All equipment installed by this project will be owned by ATC. The Gardner Park Substation was previously approved by the Commission in Docket 137-CE-113 (Arrowhead – Weston Project). The Central Wisconsin Switching Station will be a new 345 kV switching facility as proposed in this Application. Refer to Appendix H-1 for the switching station plan view drawings and layouts.

5.06.2 Size and Orientation

The Gardner Park Substation will require the installation of a new 345 kV line terminal, circuit breaker, and other associated facilities. The existing bus is designed for the additional terminal in its breaker-and-one-half configuration. No expansion of the existing fence is required. The planned control house will be used to house the new protective relay and control panels and communication equipment. The planned AC and DC electrical systems have adequate panel space and will be used by the new equipment, protective relay panels, and communications equipment. The bus, circuit breakers and disconnect switches will be designed for 3000 Amps continuous. Three surge arrestors will be installed on the outgoing line to Central Wisconsin. Fiber optic communications will be used for one independent relay channel with Power Line Carrier used for the other channel. No dimension changes are planned to the Gardner Park Substation to accommodate the new line terminal. The substation fenced area will remain at 525 feet by 1050 feet. The substation site and layout is provided in Appendix H-1, Exhibit 6.

The Central Wisconsin Switching Station involves the installation of a new three-breaker 345 kV ring bus with arrangement for a fourth future bus position. Three 345 kV circuit breakers, bus disconnect switches, and line disconnect switches will be installed. Lines from Gardner Park, Werner West, and Morgan (the Morgan – Werner West 345 kV Transmission Line that will loop through the Central Wisconsin Switching Station is proposed in Docket 137-CE-123) will terminate at Central Wisconsin. Three surge arrestors will be installed on each of the lines. The bus, circuit breakers, and disconnects will be sized for 3000 Amps continuous. Three single-phase Capacitor Coupled Voltage Transformers (CCVTs) will be installed on each bus to provide for control and relaying. An additional CCVT with a line tuner and wave trap will be provided on one phase of the transmission line terminals to provide for communication, control and relaying. Fiber optic communications will be used for one independent relay channel with Power Line Carrier used for the other channel.

It is expected that a new 24-foot by 40-foot prefabricated control building will be installed. The building will house AC and DC equipment, protective relay panels, control panels, Remote Terminal Unit (RTU), and communications equipment.

Three sites are being considered for the Central Wisconsin Switching Station: (1) Adjacent to the existing Badger Substation; (2) West Badger; on the existing J-36 line and one-half mile west of Range Line Road; and (3) Shawano near River Bend Road and the north side of STH 29. ATC's proposed location is adjacent to the Badger Substation. All three sites would have a fenced area of approximately 600 by 400 feet or about 5.51 acres. ATC owns a 40-acre parcel at the Badger site, has an option on a 20-acre parcel for the West Badger site and an option on 32 acres for the Shawano site. All sites are sufficient for constructing the switching station and the interconnecting transmission lines. The switching station sites are shown in figures in Appendix A, Figure 1. Preliminary layout of the proposed switching station is shown in Appendix H-1.

5.06.3 Landscaping

No special landscaping provisions have been made due to the character of the surrounding area.

5.06.4 Ownership and Topography

Prior to construction, ATC will have acquired ownership over the final switching station location approved by the Commission, and a detailed survey will be completed to establish site elevations for construction planning and stormwater management design.

The topography of the three switching station sites is depicted on Appendix H-4, Exhibits 1, 2, and 3.

5.06.5 Transmission Lines and Structures

The transmission lines and structures on each of the substation or identified switching station sites is depicted on Appendix H-1, Exhibits 1 through 6.

5.06.6 Access Roads

The access road to the Gardner Park Substation will be from Gardner Park Road, and the existing substation driveway. The access to the Central Wisconsin Switching Station will be from the nearest public road to the station driveway, as depicted on Appendix H-1, Exhibits 1 through 6.

5.06.7 Construction Procedures

Preliminary site plans have been developed for the Proposed and Alternate Central Wisconsin Switching Station sites. Erosion control plans for the switching stations will include some or all of the following:

1) Vehicle tracking pads placed at intersections of the proposed access drives and adjoining public roads;

2) Silt fences and/or temporary earthen berms placed down slope of all disturbed areas, as appropriate;

3) Construction-time sediment trap (if needed) to adequately control off-site transport of sediment;

4) Stone check dams placed in swales to slow runoff velocity and trap sediment;

5) Rip-rap inlet and outlet protection of all proposed culverts; and

6) Seeding and mulching or matting to provide adequate erosion control during site restoration. Erosion control matting will be placed on all slopes exceeding 5:1 (rise and run) or in areas of channelized flow.

If initial evaluation of proposed switching station areas indicates sufficient space, one of the following will be included as a stormwater management practice:

1) Detention basin(s) – Depending on the site constraints, either one or two detention basins may be designed to control peak runoff rates and provide water quality improvement. The detention basin(s) location will be designed based on site characteristics; and

2) Infiltration practices – If subsoil conditions and depth to groundwater allow infiltration, infiltration practices will be designed to meet or exceed the WDNR infiltration criteria.

5.06.8 Environmental Information

The Central Wisconsin Switching Station is the only new substation facility proposed and is not anticipated to have any effects on the environment other than the required land clearing activities. The proposed construction at the Gardner Park Substation is entirely within the existing substation fence.

5.06.8.A Land Use and Zoning

Each of the potential sites identified for the Central Wisconsin Switching Station are zoned “General Agricultural District.”

5.06.8.B Agricultural Impacts

The Proposed Central Wisconsin Switching Station site is in part is currently in agricultural use for row crops. An Agricultural Impact Statement will be prepared by the DATCP and will form part of the environmental evaluation of this Application.

5.06.8.C Forestry Impacts

The Proposed Central Wisconsin Switching Station site is partly forested. Approximately five acres of trees would need to be cleared. The alternate sites are currently in agricultural row crop production and are not forested.

5.06.8.D Endangered / Threatened / Special Concern Species

Potential switching station locations were included in the Wisconsin Natural Heritage Inventory (WNHI) database search for the Project. See refer to the WDNR Utility Permit Application, attached as Appendix E-1. Prior to initiating switching station construction activities, a site survey will be conducted at the proposed switching station locations.

5.06.8.E Archaeological and Historical Resources

There are no known archaeological resources at the Proposed Central Wisconsin Switching Station site. Information regarding the locations of known archaeological resources and historic sites in the Project area has been obtained through a review of the records maintained by the Wisconsin Historical Society (WHS).

5.06.8.F Affected Waterways

Construction of the proposed switching station at the proposed or alternate locations will not affect any waterways.

5.06.8.G Wetlands

Construction of the Central Wisconsin Switching Station at the proposed or alternate locations is not expected to affect any wetlands. There is a wetland complex located to the east of the proposed switching station site that may require a westward shift of the building footprint to avoid impacting the wetlands with a corner pole structure. An aerial photograph showing the proposed site of the Central Wisconsin Switching Station is included in Appendix E-3, Figure 5.

5.07 (1-3) EMF INFORMATION

Magnetic field calculations were performed using the ENVIRO program developed by the Electric Power Research Institute (EPRI) and are located in Appendix C.

5.08 WDNR PERMITS AND APPROVALS

A copy of the WDNR Utility Permit Application is provided in Appendix E-1.

5.08.1 Waterways and Wetlands

A number of permits are anticipated to be required for the Project. A Utility Permit Application has been submitted contemporaneously to the WDNR and USACE for all required permits. WIS. STAT. § 30.025(1b) and (1e)(2003).

5.08.2 Wetlands Alternatives Analysis

This section provides the information required for the construction of utility facilities. *See* WIS. STAT. § 30.025 (2003); WIS. ADMIN. CODE Ch. NR 299 (2000)(Water Quality Certification).

The alternatives analysis framework to be used for new electric transmission facilities is established is three provisions of the Wisconsin Statues. WIS. STAT. §§ 1.12(6), 23.09, and 30.025 (2003). To the greatest extent feasible consistent with economic and engineering considerations, reliability of the electrical system, and protection of the environment, corridors for proposed new electric transmission lines should be used in the following priority:

1) Existing utility corridors;

2) Highway and railroad corridors;

3) Recreational trails; and

4) New corridors.

Appendix A, Figure 1 shows the Proposed and Alternate routes, as well as other segments that could be used to modify the route segments. Section 5.02 and Appendix E-1 provide additional detail regarding the Proposed Route, the Alternate Route, the other segments, and the

proposed and the two alternate Central Wisconsin Switching Station sites. In addition, the EITs (Appendix E-2) provide additional detail on the alternative analyses.

Structure locations have undergone an initial "spotting" process using Power Line Systems Computer-Aided Design (PLS-CADD), an industry standard software program used to design electrical transmission lines. PLS-CADD utilizes design criteria inputs for weather cases, tension limitations, vertical/horizontal clearances, wire galloping, and insulator swing. Such modeling also requires incorporating combinations of structure types and heights with allowable wind and weight spans, maximum line angles, allowable insulator swing angles, and coordinates of wire attachment points. Under such design constraints, even slight modifications, such as increases in structure height, span distance, and/or angle, to any specific structure or series of structures may force changes to one or more adjacent structures to meet minimum design codes safety and reliability requirements. The PLS-CADD spotting was further refined to minimize impacts on the sensitivities as set forth in this Application.

Additional spotting constraints include roadways, waterways, and other overhead and underground utilities. Proposed structure locations within the proposed ROW have been developed in a manner to avoid, and where they could not be avoided, to minimize, potential impacts to wetlands and natural resources while meeting the specific transmission line design criteria. In selecting both the Proposed Route and the Alternate Route, wetlands and waterways have been spanned wherever possible within the given design constraints. Typically, a minimum distance of 50 feet has been maintained between a proposed structure and a stream or river crossing.

Special consideration was taken to restrict placement of structures in wetlands given the design constraints. Wherever possible, wetland avoidance and minimization included:

- Spanning wetlands that could be easily be spanned;
- Avoiding areas of exceptional or unique and potentially sensitive quality; and

- Minimizing the number of structures in extensive wetlands by careful spotting.

Additional detail regarding the overhead construction procedures and structure type are discussed in Section 5.01.8.

5.08.3 Storm Water Management

A construction site erosion control permit for construction activities is required for the construction of the new Central Wisconsin Switching Station. WIS. ADMIN. CODE Ch. NR 216 (2004). Request for this permit is included in the WDNR Utility Permit Application (Appendix E-1). If any unanticipated dewatering becomes necessary, ATC will follow the pit/trench dewatering standards and conditions of the Storm Water Discharge Permits received under the WDNR Utility Permit Application. *See generally* WIS. STAT. Ch 283 (2003); WIS. ADMIN. CODE Ch. NR 216 (2004). The Proposed Switching Station Site consists of agricultural fields and woodlands.

All construction activities associated with structure erection, including staging areas and access to and along the ROW corridors, shall be conducted using WDNR BMPs.

5.08.4 Endangered/Threatened Species Incidental Take

ATC's review of the WNHI database indicates the potential presence of several endangered/threatened species near the vicinity of the Proposed and Alternate routes. During wetland delineation fieldwork conducted during the growing season within the corridor, no endangered or threatened species were observed. Protected Species Protocols and other protective measures will be implemented to avoid impacts to endangered and threatened species and their habitats, if encountered. The measures include identification and avoidance, as well as conducting construction activities during the winter (dormant) season.

5.09 OTHER AGENCY CORRESPONDENCE

Copies of correspondence with other agencies are provided in Appendix D. In accordance with the Commission's regulations, ATC has put on its mailing list local distribution utilities Central Wisconsin Electric Coop, Wisconsin Electric Power Company, Wisconsin Public Service Corporation, Wisconsin Public Power Inc., Badger Power Marketing Authority; all of them attended

one or more of the Open Houses conducted in connection with the Project. WIS. ADMIN CODE § PSC 112.06(i) (2000).

5.10 PROPERTY OWNER INFORMATION

Appendix F-1 contains a mailing list of the public and private property owners within 300 feet of the Proposed Route. Appendix F-2 contains the comments received by ATC at the public opens houses discussed in Section 5.02.3 above. Appendix G-3 contains a listing of all public officials, agencies, and local media. ATC will continue to maintain communication with all public officials representing the affected property owners.

APPENDIX A – MAPS

APPENDIX B – TRANSMISSION STUDIES

B-1. Gardner Park – Central Wisconsin 345 kV Transmission Line, Project Planning Document, dated February 22, 2005

B-2. Generator Interconnection Request GIC044, Facility Study Report, dated August 29, 2003

B-3. Generator Interconnection Request GIC044, Facility Study Report Addendum, dated December 18, 2003

B-4. Generator Interconnection Request GIC044, Facility Study Report Addendum II, dated October 4, 2004

B-5. Generator Interconnection Request GIC044, Facility Study Report Addendum III, Revision 1, dated February 24, 2005

B-6. Facility Study Summary for Request #75000492, dated August 27, 2003

B-7. Facility Study Summary for Request #75000492, Revision 1, dated January 5, 2005

B-8. Facilities Study Summary - 75439243, dated September 20, 2004

B-9. System Impact Study for Long-Term Firm Transmission Service – 75994088, dated November 19, 2004

B-10. Calculation of Net Present Value of Line Losses

B-11. Generation-Transmission interconnection agreement by and between ATC and WPSC, dated December 22, 2003

B-12. Network Integrated Transmission Service Agreement between WPSC and ATC, dated December 27, 2000

APPENDIX C – EMF STUDIES

C-1. EMF Segment Map

C-2. EMF Cross-reference table

Tables 1-12

Figures 1-16

APPENDIX D – AGENCY CORRESPONDENCE

D-1. Letter to WisDOT re: use of State Trunk Highway 29 Corridor

APPENDIX E – WDNR UTILITY PERMIT APPLICATION

E-1. Application

E-2. Environmental Inventory Tables

E-3. Environmental Maps

Figure 1: Segment Location Sheet Index

Figure 2: Topography

Figure 3: Orthophotography

Figure 4: Construction Access Plan

Figure 5: Central Wisconsin Switching Station, Site Plan for Proposed Site

APPENDIX F – PROPERTY OWNERS AND PUBLIC COMMENTS RECEIVED

F-1. List of Property Owners within 300 Feet of Proposed Route

F-2. Comments Compiled from All Open Houses

F-3. Handouts at Open Houses

F-4. List of Government Property Owners

APPENDIX G – GOVERNMENT OFFICIALS/MEDIA

G-1. Environmental Impact Fee, Data for Determination

G-2. Municipal Resolutions

G-3. Public Officials and Media Contacts

G-4. Agency Contacts

G-5. Media Contacts

APPENDIX H – TRANSMISSION FACILITIES

H-1. Switching and Substation Layout Diagram(s)

- Exhibit 1 Central Wisconsin Proposed Site Option 1
- Exhibit 2 Central Wisconsin Proposed Site Option 2
- Exhibit 3 Central Wisconsin Proposed Site Option 3
- Exhibit 4 Central Wisconsin Alternate Site
- Exhibit 5 Central Wisconsin Other Alternate Site
- Exhibit 6 Gardner Park Substation

H-2. One-line diagram(s)

- Exhibit 1 Central Wisconsin Switching Station
- Exhibit 2 Gardner Park Substation

H-3. Preliminary Construction Schedule

H-4. Central Wisconsin Switching Station Conceptual Erosion Control Plan

- Exhibit 1 Central Wisconsin Proposed Site
- Exhibit 2 Central Wisconsin Alternate Site
- Exhibit 3 Central Wisconsin Other Alternate Site

H-5. Cost Estimate by Segment

APPENDIX I – ROUTING STUDY

APPENDIX J – DETAILED ROUTE INFORMATION TABLES

Table 1 Land Use Summary (by segment)

Table 2 Distance to Structures (by segment)

Table 3 Route Summary (by route)