Application for

Certificate of Public Convenience and Necessity

MORGAN – WERNER WEST 345 kV TRANSMISSION LINE; CLINTONVILLE – WERNER WEST 138 kV TRANSMISSION LINE; AND ASSOCIATED SUBSTATION FACILITIES

PSCW Docket No.

137-CE-123

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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
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
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 Project and Morgan-Werner West Project
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
NUP	Northern Umbrella Plan
OATT	open access transmission tariff
OHWM	Ordinary High Water Mark
OPGW	Optical Ground Wire

p.u.	per unit
Project	Morgan – Werner West 345 kV Transmission Line; Clintonville – Werner West 138 kV Transmission Line; and Associated Substation Facilities
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
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 a new 345 kV transmission line between the existing Morgan and proposed Werner West substations, a new 138 kV transmission line between the Clintonville and Werner West substations[*], and related substation modifications (collectively, the project is referred to as the Morgan – Werner West Project, or the "Project"). WIS. STAT. §§ 196.49 & 196.491 (2003); WIS. ADMIN. CODE Ch. PSC 4, 111 & 112 (2000). The facilities proposed in this Application would be constructed in Oconto, Shawano, Waupaca, and Outagamie counties, Wisconsin.

A. Overview

The most constrained portion of the ATC transmission system is currently in and around the Green Bay area. The constraints in this area have resulted in chronic and costly redispatch of generation on the ATC system to keep line and transformer loadings in the area operating within safe limits. Addressing all of the constraints individually would require that ATC implement at least 24 individual projects, an undertaking that would be both

[*] The Werner West Substation has not yet been authorized by the Commission. ATC has made application to construct a proposed new substation to be known as the "Werner West Substation" in Docket No. 137-CE-134. The two transmission lines that ATC proposes to construct in this Application would interconnect with the Werner West Substation, if approved by the Commission.

difficult and costly to accomplish. ATC has been conducting comprehensive analyses of various alternatives to resolve these constraints. The result of those analyses was the development of what ATC refers to as its Northern Umbrella Plan (NUP). The NUP is comprised of eight system reinforcement projects that directly address system constraints, aging facilities and transmission service needs. ATC has already begun implementing four of these projects, three in Wisconsin (Plains – Amberg – Stiles – West Marinette, Morgan – Stiles, and Morgan – White Clay) and one in the Upper Peninsula of Michigan (Hiawatha – Indian Lake). Commission authorization was applied for and received in 2004 for the Plains – Amberg – Stiles – West Marinette and Morgan – Stiles projects.[*]

While all of the NUP projects will provide identifiable benefits, ATC's analyses show that the single most critical project of the eight in relieving the chronic constraints is a new 345 kV line from ATC's existing Morgan Substation in Oconto County to the proposed Werner West Substation in Outagamie County. This Project would effectively form an electrical bypass around the Green Bay area, resolving numerous constraints in and around the Green Bay area, significantly improving reliability in the northern portion of ATC's transmission system, tying the 345 kV network in the northern-most part of ATC's system to the southern portion of ATC's system, enhancing the performance of the other seven reinforcement projects identified in the NUP, and significantly reducing system losses. This project can be implemented without the numerous and lengthy of outages that would be required if each constraint were addressed individually.

American Transmission Company also proposes to construct a new 138 kV circuit from the proposed Werner West Substation to the existing Clintonville Substation and to make related substation modifications at the proposed Werner West Substation and the existing Clintonville and Badger substations to accommodate this new circuit. This portion of the Project would connect two 138kV networks west of Green Bay and Appleton, which would further mitigate transmission system constraints. Specifically, the proposed 138kV line would: (a) reduce contingency loading on the Highway V – Preble-Tower Dr. 138kV line; (b) reduce contingency loading on the North Appleton

[*] The scope and cost of the Morgan – White Clay project were such that it did not require a Commission certificate. The Hiawatha – Indian Lake project is located entirely in the State of Michigan. Both projects are under construction.

– Lawn Rd. – White Clay 138kV line; (c) reduce contingency loading on the Badger 138/115 kV transformer and the Badger – Caroline 115 kV line; and (d) provide a second 138 kV source to Clintonville and facilitate a future de-energized rebuild of the Pulliam – Stiles double-circuit 138 kV line which would not be possible under current system conditions.

American Transmission Company is separately proposing a 345 kV transmission line and related facilities to accommodate the new generating unit (known as Weston 4) currently under construction by Wisconsin Public Service Corporation (WPSC) at its Weston Power Plant to be located adjacent to WPSC's existing Weston 3. This proposed construction, the Gardner Park – Central Wisconsin Project, is the subject of Docket No. 137-CE-122.

American Transmission Company has evaluated the proposed Project along with alternatives that accomplish many of the same objectives. Based on that evaluation, ATC has determined that the proposed Morgan – Werner West Project is the most effective and least costly of the alternatives identified.

American Transmission Company has also conducted a comprehensive evaluation of alternative routes for the proposed Project. ATC's route 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.

* Because the proposed Project is contiguous with the proposed Gardner Park – Central Wisconsin Project, PSCW Docket No. 137-CE-122, the public outreach and routing were accomplished together to promote efficiency and effectiveness of communication.

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 transmission and gas pipeline) corridors, the highest statutory priority, highway corridors in the second priority category, and a former railroad right-of-way (ROW) now owned by the State.* The Alternate Route uses electric transmission and gas pipeline corridors, highway corridors, and some new ROW.

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, if ATC's Application is approved, ATC will be able to construct the proposed Project expeditiously.

B. Purpose And Necessity

The northern portion of ATC's transmission system is the most constrained portion of ATC's system. Numerous transmission lines and transformers are routinely operated near system security limits, that is, at or near their maximum safe operating limits. Because of these security limits, transmission service is routinely denied or interrupted and/or generation must be routinely redispatched. The cost of this generation redispatch has increased from $2.1 million in 2001 to $5.9 million in 2003. The cost of

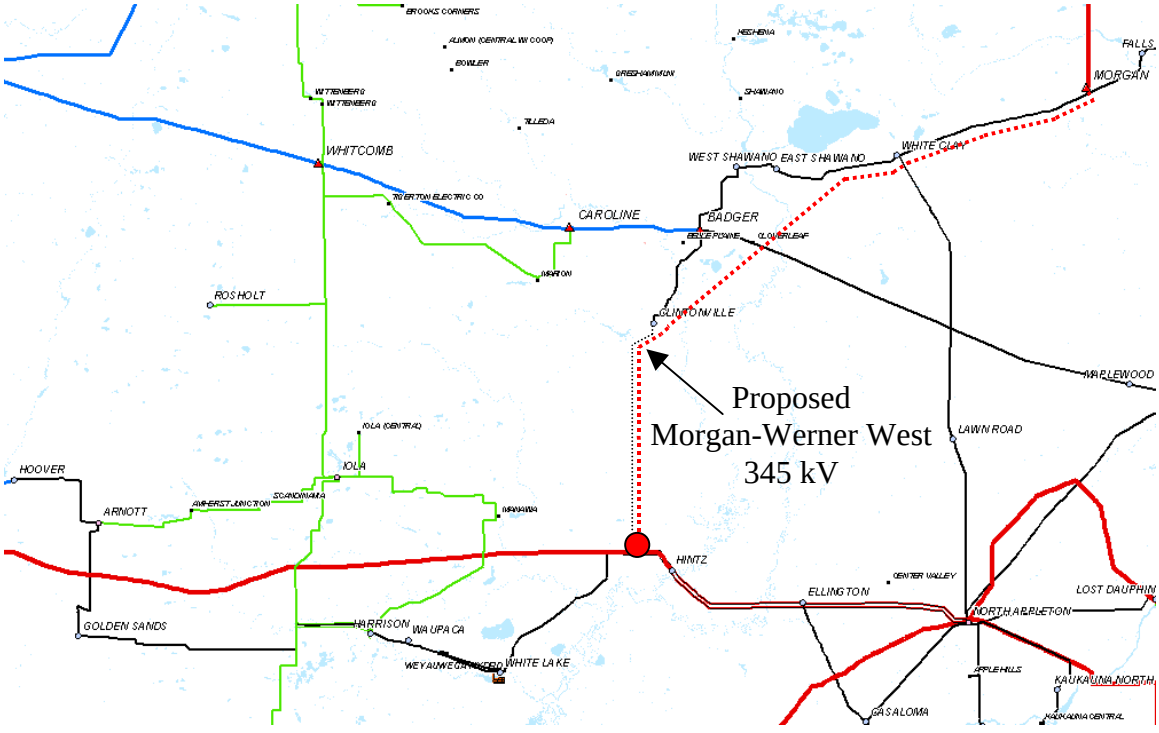
* The former railroad ROW should probably be considered in the second statutory priority, which includes railroads. It is not presently a recreational trail (the third priority), although such a trail may be developed in the future. Ownership of the former railroad ROW is held by various owners including WisDOT, WDNR, and private landowners, and therefore is not appropriately classified in the fourth priority.

generation redispatch is borne by ATC transmission customers and, ultimately, by their retail electric customers.

In addition, the reliability of transmission service in the northern portion of ATC's transmission system has proven to be inadequate. There were three incidents in recent years in which partial or total blackouts occurred because elements of the transmission system were overloaded and the remainder of the transmission system could not adequately handle the transmission service that was necessary to meet ATC's transmission system customers' requirements.

The map set forth below generally describes the location of the proposed new 345 kV transmission line for which ATC seeks authority to construct in this Application (this map does not show the specific route of the line).

Figure 1. Proposed Morgan – Werner West 345 kV Transmission Line.



C. Description

The Project involves construction of a new 345 kV transmission line between the Morgan Substation and the proposed Werner West Substation, double-circuited with a 138 kV transmission line for the Clintonville – Werner West portion of the line and the addition of line terminal equipment at the proposed Werner West Substation, existing Clintonville Substation and existing Morgan substations. Should the proposed Gardner Park – Central Wisconsin Project be constructed, as proposed in PSCW Docket No. 137-CE-122, the proposed Project will also connect at the proposed Central Wisconsin Switching Station. Figure 1 above 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).

1. New Morgan – Werner West 345 kV Transmission Line. The primary component of the proposed Project is a new 345 kV transmission line from the Morgan Substation located near Oconto Falls, Wisconsin, to the proposed Werner West Substation near New London, Wisconsin, a distance of approximately 51 miles. The new transmission line is proposed to be constructed entirely overhead, primarily on single pole steel structures which will be double-circuited on all of the corridors with the exception of the pipeline corridor.

In accordance with the Commission's regulations, ATC is presenting two alternative routes for the Morgan – Werner West 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 is located on a combination of existing transmission ROW, pipeline corridor, road ROW, new ROW and an abandoned railroad ROW. Those facilities begin at the Morgan Substation along an existing 138 kV transmission line corridor (designated by ATC as "line KK26522" Morgan – White Clay), continuing on an existing 138 kV transmission line corridor

(designated by ATC as "line KK26523" White Clay – East Shawano), where it connects with the pipeline corridor going southwest to the area of Cloverleaf Substation, to the northwest along the 138 kV transmission line (designated by ATC as "W75" Cloverleaf – Badger), southeast out of the Badger Substation area following the 138 kV transmission line (designated by ATC as "line KK86502" Badger – Clintonville) and pipeline corridor, and follows new ROW, County Trunk Highway D, and an abandoned railroad corridor to USH 45. The Proposed Route follows USH 45 to the existing ATC transmission line ROW at the Proposed Werner West Substation.

The Alternate Route, approximately 52 miles in length, shares several common segments with the Proposed Route. The Alternate Route is located on existing transmission line ROW and/or along state highways from the existing Morgan Substation southwest to the intersection of the existing 138 kV transmission line designated KK86504. From this intersection, the Proposed Route follows STH 22 and/or Line KK86504 and the existing 138 kV transmission line designated Line KK86502 south. The Alternate Route consists of mostly new ROW south and east of the Clintonville Substation to the Werner West Substation and is agricultural.

There are several additional segments between the Morgan, proposed Central Wisconsin, and proposed Werner West substations. These segments, while possible transmission line locations, utilize second and fourth priority corridors. WIS. STAT. §1.12(6)(2003).

2. Clintonville – Werner West 138 kV Transmission Line. The other major component of this Application is the proposed construction of a new 138 kV transmission line from the existing Clintonville Substation to the Werner West Substation of approximately 18.3 miles in length. The 138 kV circuit is proposed to be entirely overhead construction and will be double-circuited on the Morgan – Werner West Transmission Line structures.

3. Associated Substation Facilities. At ATC's existing Morgan Substation, ATC proposes to add a new 345 kV terminal, including two new 345 kV breakers and the associated bus, all on ATC-owned property. At ATC's proposed Werner West Substation, which is the subject of PSC Docket No. 137-CE-134, ATC proposes to add the necessary electrical and communication equipment to allow the connection of both the 345 kV line to the Morgan Substation, and the 138 kV line to the Clintonville Substation, all within the fenced-in area proposed in Docket No. 137-CE-134. ATC will also add a 138 kV line terminal at the existing Clintonville Substation. ATC also

proposes to establish a fiber communications path between the Central Wisconsin Switching Station (proposed in PSC Docket No. 137-CE-122) and the control house at ATC's adjacent Badger Substation.

D. Estimated Project Cost

The total cost of the Morgan – Werner West Project is dependent on the transmission line route approved by the Commission. ATC estimates that the total cost of the Project using the Proposed Route to be $97.8 million.[*] This includes approximately $3.1 million of construction costs for the Clintonville – Werner West 138 kV Transmission Line proposed as part of the Project. Detailed cost information is provided in Section 5.01.7 and Appendix H-5 of the attached TSD.

E. Construction Schedule

Construction is planned to begin in November, 2006 and the planned in-service date for this Project is December, 2009. A proposed construction schedule is provided in Appendix H-3 to 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 to the counties, towns, and villages as required. *See* WIS. STAT. § 198.491(3)(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.

[*] 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.

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 51 miles of new 345 kV transmission line between the existing Morgan and proposed Werner West substations, together with certain substation modifications at the existing Morgan Substation and the proposed Werner West Substation, along a combination of existing transmission line, gas pipeline, road and new rights-of-way (ROW), depending on the route determined by the Commission. The Werner West Substation is subject to Commission review and approval in Docket No. 137-CE-134. ATC also proposes to construct a new 138 kV circuit, approximately 18.3 miles in length, from the proposed Werner West Substation to the existing Clintonville Substation, jointly used by ATC and the Badger Power Marketing Authority (BPMA), along with certain substation modifications at the proposed Werner West Substation. The proposed 138 kV line would be generally co-located on the same transmission structures as the proposed 345 kV transmission line. Should the Commission approve the Gardner Park – Central Wisconsin Project in Docket No. 137-CE-122, the proposed Morgan – Werner West 345 kV Transmission Line will interconnect with that line at the Central Wisconsin Switching Station proposed in PSC Docket No. 137-CE-122, and for purposes of protective relay communications, a new optical fiber will connect the Central Wisconsin Switching Station to ATC's communications facilities at the existing Badger Substation. If the Commission does not approve the proposed Gardner Park – Central Wisconsin Project, then the line proposed in this Application will not interconnect with other portions of ATC's transmission system except the Morgan Substation and the proposed Werner West Substation.

5.01.2 Size and Configuration of Lines

Size of lines

The Proposed Route for the 345 kV line is approximately 51 miles in length. If the Alternate Route is selected, the 345 kV line would be approximately 52 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 138 kV circuit, the existing structures will be removed and replaced with double-circuit single-pole structures supporting both circuits.

The new 138 kV transmission line between Clintonville and Werner West will be constructed for and operated at 138 kV. The 138 kV line will be constructed with T2-556.5 kcmil ACSR (Dove) conductor or a conductor with similar capacity.

Configuration of lines

The lines will be constructed on weathering steel single-pole structures utilizing arms with I-string or V-string insulators. All 345 kV steel pole structures are proposed to 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

The transmission system studies performed by ATC indicate that the northern portion of ATC's transmission system beginning in the Appleton area is the most constrained portion of ATC's system. Potential overloads have caused 108 incidents of transmission system overloading in 2003 alone, where the transmission system had to be reconfigured, generation redispatched, or transmission service curtailed or interrupted in order to maintain firm transmission service to ATC's transmission customers. In 2003 alone, approximately 4 million megawatt-hours (over 450 MW

average per hour) of transmission service requested by ATC's transmission customers could not be provided based on the transmission system operating limits under certain contingencies in the Green Bay area and areas north and west of Green Bay. In addition, the reliability of the northern portion of ATC's transmission system has proven to be inadequate, with three incidents in recent years in which partial or total blackouts have occurred. The transmission studies performed by ATC are set forth in Appendix B to this Application.

American Transmission Company has developed a comprehensive plan, called the Northern Umbrella Plan (NUP), consisting of eight distinct transmission system projects to address the numerous constraints and reliability issues in the northern portion of its transmission system. ATC has completed or is in the process of constructing seven of the projects. The key and final project of the NUP is the Project proposed here: the Morgan – Werner West Project. The two new transmission lines that comprise the Project will provide a high capacity parallel path around the Green Bay area, relieving flows on the constrained 345/138 kV transformers and 138 kV lines in the Fox River Valley area.

The proposed Morgan-Werner West 345 kV Transmission Line will:

- Tie the 345 kV network in the northern-most part of the ATC system to the southern portion of the system, thereby improving system reliability in northern portion of ATC's transmission system, and reducing the likelihood of future blackouts;
- Significantly reduce system losses;
- Significantly increase transfer capability in the northern portion of ATC's transmission system;
- Resolve numerous constraints in and around the Green Bay area;
- Provide a tie to the proposed Gardner Park – Central Wisconsin 345 kV Transmission Line, which provides a strategic interconnection point for the transmission facilities required to interconnect and provide transmission service for the planned new Weston 4 generator at Weston;
- Enhance the performance and effectiveness of the other seven NUP projects; and

- Significantly improve operating flexibility in northern Wisconsin, allowing for scheduled maintenance outages of other portions of the transmission system in the area.

As part of the proposed construction, a new 138 kV circuit is to be installed on the same structures as the proposed 345 kV line, from Clintonville south to the proposed Werner West Substation. The proposed Clintonville – Werner West 138 kV Transmission Line will:

- Reduce contingency loading on four 138 kV circuits, a 115 kV line and a 138/115 kV transformer in and west of the Green Bay area;
- Provide a second 138 kV source to Clintonville, and increase reliability by eliminating the radial supply to the Clintonville Substation; and
- Facilitate a future de-energized rebuild of the Pulliam-Stiles double-circuit 138 kV line which would not be possible under current system conditions without unduly risking loss of load in northern Wisconsin and the Upper Peninsula of Michigan.

In order to evaluate alternative solutions, ATC made certain assumptions regarding the status of future projects. ATC is planning several reinforcements throughout its service territory between 2005 and 2009 that will have a direct or indirect impact on system operations in northern Wisconsin. Those reinforcements, listed below with their in-service dates, were included in the system models developed.

- Completion of the Morgan – White Clay 138 kV line clearance improvement project (2004/05);
- Completion of the second Wempletown – Paddock 345 kV line (2005);
- Completion of the Fox Energy generation plant (2005);
- Completion of a Fox Energy – Forest Junction 345 kV line (2005);
- Addition of the 5-ohm reactor in the Highway V – Preble 138 kV line (2005);
- Completion of the North Appleton 345 kV ring bus (2005);

- Completion of the North Appleton – Rocky Run 345 kV line clearance improvement project (2005);
- Completion of the Sheboygan Energy Center interconnection substation (2005);
- Completion of the Hiawatha-Indian Lake 69 kV line project (2005);
- Completion of the Blue Sky Wind Farm LLC and Green Field Wind Farm LLC wind generation projects interconnection at the Cyprus Substation (2005/06);
- Completion of the Werner West 345/138 kV Substation (2006);
- Completion of the Weston – Hilltop 115 kV line (2007);
- Completion of the Cranberry – Conover – Plains 138 kV line project (2008);
- Completion of the Weston 4 interconnection facilities (Gardner Park Substation) (2008);
- Completion of the Arrowhead – Weston 345 kV line (2008);
- Conversion of the Hiawatha – Indian Lake 69 kV line to 138 kV operation (2009); and
- Completion of an Indian Lake – Pine River – Straits 138 kV line (2009).

5.01.3.A System Normal

While several transmission facilities in and around the Green Bay area can be heavily loaded under system normal conditions (all facilities in service), no facility overloads have been or are projected under system normal conditions.

5.01.3.B Single Contingencies

During single contingency conditions,* several lines in the Green Bay area (generally south and west of Green Bay) will experience loads over 100% of their summer emergency ratings by 2009 unless ATC reinforces its system. Appendix B-1 shows the loadings for these lines, as well as other lines that will be near overloads under the worst contingency condition. Appendix B-1 also shows the single contingency loading assuming the Morgan – Werner West Project is built as proposed. In each case, the proposed construction will eliminate the overload condition.

5.01.3.C Alternative Solutions

The planning studies performed by ATC have identified numerous benefits of a 345 kV circuit tying its northern and southern 345 kV systems together. To ensure that other viable alternatives were not overlooked, ATC considered, developed and evaluated a number of alternatives to the proposed Morgan-Werner West Project. Each alternative was evaluated on the basis of its ability to address all of the transmission service constraints to the same level, thereby allowing a direct comparison of the alternatives. The primary concern addressed is relief of the loading of lines and transformers in the area under contingency conditions.

The transmission system constraints experienced in and around the Green Bay area occur primarily during shoulder peak periods, when load levels are at 70 to 90% of peak and certain generators normally operated during peak load conditions are not operating. In addition, certain constraints can occur during peak load conditions in the area when transfers to the northernmost segment of ATC's transmission system are at or near operating limits. As such, system models were developed simulating these operating conditions for year 2009 and a system model of peak load conditions for year 2013.

* 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.

Based on this analysis, ATC settled on three alternative groups of projects, all with roughly equivalent benefit in relieving system constraints. Those alternatives are:

System Alternative 1 (the proposed Project): Morgan-Werner West Project.

- Construct a new 345 kV line from Morgan Substation to the proposed Werner West 345 kV Substation; and
- Construct a new Clintonville – Werner West 138 kV line to be installed on the same structures as the Morgan-Werner West 345 kV line.

System Alternative 2: Morgan-North Appleton 345 kV line.

- Construct a new 345 kV line from Morgan Substation to North Appleton Substation; and
- Rebuild the North Appleton – Lawn Road – White Clay 138 kV line and the White Clay – Morgan 138 kV line as a 345/138 kV double-circuit line from the Morgan Substation to the North Appleton Substation on existing 138 kV ROW.

System Alternative 3: Lower Voltage Enhancements.

- Rebuild the existing Highway V – Preble 138 kV line;
- Add a fourth 345/138 kV transformer at North Appleton Substation and construct a 138 kV ring bus;
- Rebuild the existing Pulliam-Stiles double-circuit 138 kV lines;
- Construct a new Clintonville – Werner West 138 kV line;
- Re-conductor the White Clay – Morgan 138 kV line;
- Rebuild the North Appleton – Pulliam 138 kV line as double-circuit 138 kV;
- Replace terminal equipment at Oconto Substation for the Stiles-Oconto 138 kV line;

- Replace terminal equipment at East Krok Substation for the East Krok-Kewaunee 138 kV line;
- Rebuild the North Appleton – Lost Dauphin 138 kV line as double-circuit 138 kV; and
- Uprate (conductor ground clearance) the North Appleton – Ellington 138 kV line.

Discussion of System Alternatives

Each system alternative was evaluated on its ability to address the transmission system constraints that ATC is experiencing in the northern portion of its transmission system. Based on the evaluation of these alternatives, the construction of a new, 345 kV Morgan – Werner West transmission line together with the construction of a new 138 kV circuit from the Clintonville Substation to the proposed Werner West Substation is the most appropriate system alternative. A comparison of the system alternatives is set forth below.

Cost, including Life Cycle Cost. The estimated Project capital cost of the Morgan-Werner West Project is less than that of the system alternatives. The life cycle cost comparison, including capital costs, projected redispatch costs during construction, and the projected costs of loss savings, demonstrate that the proposed Morgan-Werner West 345 kV Transmission Line together with the proposed Clintonville – Werner West 138 kV line is the overall least-cost alternative. Appendix B-1 (in its attached appendix labeled Appendix B) contains ATC's life cycle cost analysis for the system alternatives.

Constructability Issues. All three system alternatives would likely require that portions of ATC's existing 138 kV transmission lines be taken out of service during construction. However, the proposed Morgan – Werner West transmission lines require the least amount of transmission outages, by both number and duration of outages, and is estimated to require, by far, the least cost of generation redispatch during construction. (Please refer to Appendix B-1 for a calculation of redispatch cost savings.)

Construction of System Alternative 1, the proposed Project, will require the building of a temporary Morgan – White Clay line and various

outages on the White Clay-East Shawano, Badger-Clintonville, Maplewood-Badger, Hintz-White Lake and the North Appleton – Rocky Run lines.

Construction of System Alternative 2 (Morgan – North Appleton 345 kV line), if utilizing existing 138 kV transmission line rights-of-way between the Morgan to North Appleton substations, may require that some or all of the Morgan-White Clay, White Clay – Lawn Road and Lawn Road – North Appleton line segments be taken out of service. These outages may require significant amounts of generation redispatch. They could also require the construction of a temporary 138 kV line over these segments.

System Alternative 3 (lower voltage enhancements) would require a significant amount of line construction – approximately 106 miles – much of it tearing down and rebuilding existing lines. This would be difficult to complete in a timely fashion given the extensive outage coordination that would be required.

Compatibility with Northern Umbrella Plan. The proposed construction is an integral part of the NUP, described above, and in conjunction with the other seven elements of the NUP that have been completed, will, if approved, further assure a robust and reliable system in the northeast Wisconsin area, and provide a much needed significant increase in transfer capability to the northern most elements of ATC's transmission system.

System Diversity. The construction of System Alternative 2, the Morgan – North Appleton line, while addressing the system reliability and service needs of ATC's customers, would require an additional 345/138 kV transformer at North Appleton Substation, further concentrating critical 345/138 kV transformer capacity at a single site. The Morgan-Werner West Project, in conjunction with the construction of the proposed Werner West Substation, would provide diversity of 345/138 kV capacity in the area.

Based on a comparison of the system alternatives, the proposed Morgan-Werner West Project provides the greatest amount of system benefits, overall, at a comparatively lower cost and is the most appropriate alternative to meeting ATC's transmission customers' needs.

5.01.3.D Electrical Losses for Each Alternative

System loss analyses were performed to estimate and compare the loss reductions and the value of those reductions for each of the three system alternatives. Capacity loss costs were based on loss differentials during peak load conditions and the cost of replacement generating 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% annually. 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 for those system conditions are shown in the table below. In all three alternatives, the most significant loss reductions occurred during shoulder peak load conditions. System Alternative 2 provided the greatest improvement in losses for both peak and off peak conditions with a reduction of 8.1 MW for the peak load conditions and 31.2 MW for the shoulder peak load conditions. The loss reductions for the preferred alternative were slightly less.

Table 1

System Alternative	2009 Summer Peak Loss Reduction	2009 Shoulder Peak Loss Reduction	Estimated Annual GWh Savings
1 Morgan-W. West 345 kV line	7.8	30.8	263.1
2 Morgan-N. Appleton 345 kV line	8.1	31.2	266.6
3 Low Voltage Enhancements	5.4	22.0	187.9

Note: System Loss reduction values are in MW.

A comparison of projected cost of system losses is shown in the table below. Since peak load periods occur relatively a small percentage of the year and shoulder peak load conditions are a far more frequent

operating condition, energy loss reductions are driven by shoulder peak conditions. This results in the total loss cost savings being driven largely by energy loss reductions.

Table 2

System Alternative	2009 Summer Peak Loss Reduction	2009 Shoulder Peak Loss Reduction	Estimated NPV of Loss Cost Savings
1 Morgan-W. West 345 kV line	7.8	30.8	$88,778,400
2 Morgan-N. Appleton 345 kV line	8.1	31.2	$90,694,200
3 Low Voltage Enhancements	5.4	22.0	$62,970,500

Note: PV = Present Value.

System loss costs were projected and reduced to a net present value over a 20-year period based on the market prices set forth in the analysis included in Appendix B-2. This resulted in an estimated present valued loss cost savings of $88,778,400 for System Alternative 1, which was slightly less than System Alternative 2. The value of loss savings for System Alternative 3 was well below the other two alternatives.

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

The proposed new Morgan-Werner West Project will have only positive impacts on stability. No circuit breakers in the affected area were shown to be over-dutied as a result of the proposed Project. Short-circuit and fault duty analyses, routinely done for generator interconnections, are not required for transmission system improvements and are not routinely done.

System thermal loading under normal and contingency conditions is presented in Section 5.01.3.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 Morgan-Werner West transmission line in Appendix A to the Midwest ISO's regional transmission expansion plan.

5.01.3.G Regional Access Studies

The proposed Morgan-Werner West 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

At ATC's proposed Werner West Substation, which is the subject of Docket No. 137-CE-134, ATC proposes to add one 345 kV breaker and the line connections to a new dead-end structure above the Werner West 345 kV bus. One 345 kV line disconnect switch and protective relay and communication equipment will also be added to the substation. To accommodate the connection with the 138 kV transmission line to Clintonville, ATC proposes to add one 138 kV breaker and the line connections to a new dead end structure mounted near the northeast corner of the 138 kV bus. One 138 kV line disconnect switch and protective relay and communication equipment will also be added to the substation. No expansion of the fence will be required beyond what will be constructed pursuant to ATC's application in Docket No. 137-CE-134.

At the Morgan Substation, ATC proposes to add a new 345 kV terminal. This includes two new 345 kV breakers (one line, and one bus breaker) and associated disconnect switches and bus work. New protective relay and control equipment will be installed for the new line to Werner West. Minor revisions will be required on the existing Morgan to Plains 345 kV line protective relaying and the Morgan 345/138 kV Transformer 1 protective relaying. The existing fenced area will be expanded to add an area on the northwest corner of 280 feet by 145 feet (approximately 0.9 acres) to accommodate the new line terminal and maintain vehicle access. The proposed expansion of the Morgan Substation will occur on ATC-owned property.

American Transmission Company also proposes to add a new 138 kV terminal at the Clintonville Substation. This would include the addition of a new circuit breaker on the Clintonville to Badger line to provide isolation of each network element. The existing control building at the Clintonville Substation will be used to house the relay and control equipment. No changes to the fence boundary are required. ATC proposes to obtain an easement from Badger Power Marketing Authority for the additional facilities.

At the existing Badger Substation, ATC proposes to establish a fiber optic communications path between the Central Wisconsin Switching Station (proposed in Docket No. 137-CE-122) and the control house at the adjacent Badger Substation. This will require the installation of a Coupling Capacitor Voltage Transformer (CCVT) and an information fiber optic communication cabinet and communications capability in the existing Badger Substation control house. The existing AC and DC electrical systems have adequate panel space and will be used by the new equipment, protective relay panels, and communications equipment.

The physical layout of the substations to be modified is provided in Appendix H-1, and electric schematic diagrams are provided in Appendix H-2. Additional information regarding substations is located in Section 5.06.

5.01.5 Contractual Agreements

American Transmission Company has not contracted with another entity to provide or own the facilities proposed in this Application.

5.01.6 Transmission Service Agreements

The Morgan – Werner West Project is required to resolve system-loading concerns and is not the result of any transmission service agreement or new transmission service request. The proposed Morgan-Werner West Project is to resolve transmission system constraints that affect ATC's ability to provide transmission service to its transmission service customers in a reliable manner, as well as enhance the overall reliability of its transmission system and to enhance the benefits derived from seven other transmission line projects. ATC's transmission customers that receive network integrated transmission service under transmission service agreements utilizing ATC's transmission facilities will be affected by the proposed changes. However, no new agreements are anticipated or required.

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:

* The estimated costs included above 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, and 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.

Table 3

			Proposed Route		Alternate Route
Capital Cost					
Transmission Lines					
345KV Line	Morgan - Werner West	$	78,295,000	$	79,514,000
345KV Line	North Appleton-Rocky Run (L6831)	$	1,251,000	$	-
138kV Line	Clintonville - Werner West	$	1,740,000	$	1,505,000
138kV Line	Badger-Cloverleaf (W-75)	$	359,000	$	-
138kV Line	Morgan-White Clay (KK26522)	$	1,051,000	$	1,334,000
138kV Line	Badger - Clintonville (KK86502)	$	669,000	$	720,000
138kV Line	Hintz-White Lake (KK65551)	$	17,000	$	-
138kV Line	West Shawano-Badger (KK66504)	$	-	$	440,000
138kV Line	White Clay-E Shawano (KK25523)	$	381,000	$	259,000
	Subtotal, Transmission	$	83,763,000	$	83,772,000
Substations					
Morgan Substation					
	ATC-owned 345kV	$	2,220,000	$	2,220,000
	Subtotal	$	2,220,000	$	2,220,000
Badger Substation					
	ATC-owned 138kV	$	94,000	$	94,000
	Subtotal	$	94,000	$	94,000
Clintonville Substation					
	ATC-owned 138kV	$	1,340,000	$	1,340,000
	Common Facilities	$	55,000	$	55,000
	Subtotal	$	1,395,000	$	1,395,000
Werner West Substation					
	ATC-owned 138kV	$	702,000	$	702,000
	ATC-owned 345kV	$	1,266,000	$	1,266,000
	Subtotal	$	1,968,000	$	1,968,000
	Subtotal, Substations	$	5,677,000	$	5,677,000
Precertification (planning, studies applications & regulatory approval)		$	4,000,000	$	4,000,000
	Total Capital Cost	$	93,440,000	$	93,449,000

			Proposed Route		Alternate Route
Environmental Fee (5% of 345kV capital costs)		$	4,342,000	$	4,340,000
	Precertification costs split by 345kV vs 138kV capital costs				
	Total Capital Cost plus Environmental Fee	$	97,782,000	$	97,789,000
Removal Cost					
	Transmission Line Removal				
345KV Line	Morgan - Werner West	$	-	$	-
345KV Line	North Appleton-Rocky Run (L6831)	$	62,000	$	-
138kV Line	Clintonville - Werner West		-	$	15,000
138kV Line	Badger-Cloverleaf (W-75)	$	173,000	$	-
138kV Line	Morgan-White Clay (KK26522)	$	452,000	$	555,000
138kV Line	Badger - Clintonville (KK86502)	$	326,000	$	326,300
138kV Line	Hintz-White Lake (KK65551)	$	62,000	$	-
138kV Line	White Clay-E Shawano (KK25523)	$	4,000	$	194,000
138kV Line	West Shawano-Badger (KK66504)	$	-	$	156,000
	Substation Removal	$			
345/138KV	Morgan - Werner West	$	-	$	-
345/138KV	Morgan	$	-	$	-
138KV	Badger	$	1,500	$	1,500
138KV	Clintonville	$	-	$	-
	Total Removal Cost	$	1,080,500	$	1,247,800
Retirement Cost					
	Transmission Line retirement				
345KV Line	Morgan - Werner West	$	-	$	-
345KV Line	North Appleton-Rocky Run (L6831)	$	(11,000)	$	-
138kV Line	Clintonville - Werner West	$	-	$	-
138kV Line	Badger-Cloverleaf (W-75)	$	(62,000)	$	-
138kV Line	Morgan-White Clay (KK26522)	$	-	$	(138,000)
138kV Line	Badger - Clintonville (KK86502)	$	(2,583,000)	$	(2,583,000)
138kV Line	Hintz-White Lake (KK65551)	$	-	$	-
138kV Line	White Clay-E Shawano (KK25523)	$	(980,000)	$	(980,000)
138kV Line	West Shawano-Badger (KK66504)	$	-	$	(766,000)
	Total Retirement Cost	$	(3,636,000)	$	(4,467,000)
Operation and Maintenance Cost					
345KV Line	Morgan - Werner West	$	-	$	-
345KV Line	North Appleton-Rocky Run (L6831)	$	11,000	$	-
138kV Line	Clintonville - Werner West	$	-	$	4,000
138kV Line	Badger-Cloverleaf (W-75)	$	31,000	$	-
138kV Line	Morgan-White Clay (KK26522)	$	155,000	$	187,000
138kV Line	Badger - Clintonville (KK86502)	$	51,000	$	55,000
138kV Line	Hintz-White Lake (KK65551)	$	11,000	$	-

			Proposed Route		Alternate Route
138kV Line	West Shawano-Badger (KK66504)	$	-	$	36,000
138kV Line	White Clay-E Shawano (KK25523)	$	32,000	$	24,000
	Total O&M Cost	$	291,000	$	306,000

Cost estimates by segment for the various line segments are located in Appendix H-5.

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 associated with both the proposed 345 kV line and the 138 kV circuit. 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

American Transmission Company's planning studies are attached at Appendix B.

5.02.2 Local Level Alternatives

The purpose of the proposed construction is to alleviate transmission constraints. ATC does not believe that any distribution system modifications would address the problems being experienced.

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 Gardner Park – Central Wisconsin 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, Public Participation, and Corridor 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 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;

* As noted previously, ATC's public outreach efforts combined the proposed Project with the Gardner Park – Central Wisconsin 345 Project. The discussion in this section combines the public outreach and resulting routing efforts of both projects.

- 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.

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 138 kV transmission lines (KK26522 and KK86504/86502) and a primary transportation corridor (STH 22 and 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.

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 (the latter being the subject of Docket 137-CE-122); 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 proposed new Morgan-Werner West 345 kV Transmission Line and companion Clintonville – Werner West 138 kV Transmission Line.

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.

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 (N140-N91-N114-N118-N85-N83-N150-N79-N66-N74-N125-N76-N144-N97-N136-N139-N100-N146-N103-N143) would utilize primary and secondary corridor preferences under for approximately 39 miles, which is over 77% of its length. *See* WIS STAT. § 1.12(6)(2003). Approximately eight miles of new corridors would be utilized. The total length of the Proposed Route is approximately 51 miles. Where the Proposed Route would utilize existing transmission line corridors, the proposed double-circuit 345/138 kV transmission line would be rebuilt in approximately the same location as the existing single-circuit 138 kV lines. Additional ROW would only be required where the Proposed Route would utilize new corridors, or where the existing utility easement is less than 100 feet wide. Cumulatively, there are 322 existing structures within 300 feet of the proposed centerline. The proposed transmission line route would cross approximately 78 acres of wetlands identified by the Wisconsin Wetland Inventory (WWI) and permanently impact approximately 0.08 acres of field-delineated/off-site delineated wetlands. (Details on wetlands impacts are provided 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 105 acres of forested lands and 646 acres of agricultural use lands would be crossed, based on 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 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 (N140-N91-N114-N118-N85-N82-N62-N66-N74-N125-N148-N76-N144-N145-N137-N143) would utilize primary and secondary corridor preferences under § 1.12(6) for approximately 35 miles. The remaining 17 miles would utilize new corridors. The total length of the Alternate Route is approximately 52 miles. Cumulatively, additional ROW would be greater due to the increased length of new corridor. There are a number of site-specific design and engineering considerations, including interchange crossings and encroachment or development along the highways paralleled. Cumulatively, there are 375

existing structures within 300 feet of the proposed centerline. The Alternate Route would cross approximately 53 acres of wetlands identified by the WWI and permanently impact approximately 0.07 acres of field-delineated/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 107 acres of forested lands and 557 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.

The other segment alternatives within the Morgan – Werner West study area were identified only to provide for two distinct routes for interconnection with any future or proposed switching station facility, or perpendicular movement between two predominant routes. The summary of impacts associated with the other segment alternatives, cumulatively providing an additional approximately 52 miles, are also included within Appendix J, Table 3.

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.

American Transmission Company has communicated with the WDNR's "Rails to Trails" coordinator in connection with segments N146-N100, N100-N139 and N139-N136, owned in part by WDNR.

American Transmission Company has also consulted with the Wisconsin Department of Transportation (WisDOT), for the routes along State Trunk Highway (STH) 29 and US Highway (USH) 45. 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 STH 29 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.

Resolution Regarding the Projects. ATC received a resolution from one governmental body, the Town of Green Valley with respect to the proposed Project. The Town of Green Valley requests that the transmission line route follow existing transmission corridors to the extent possible. This resolution is included in Appendix G-2.

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 (~51 miles). The Proposed Route, approximately 51 miles in length, is located on existing transmission line ROW or along a gas pipeline from the existing Morgan Substation at N140 southwest to the intersection of the existing ATC 138 kV transmission line designated W-75.

From this intersection, the Proposed Route follows existing line W-75 (except for a short section northwest of node N79) to the intersection of the existing 138 kV transmission line designated KK86502. The Proposed Route then follows KK86502 and STH 22 south to node N125. From N125, the Proposed Route follows a gas pipeline to N76. From N76, the Proposed Route follows new ROW, County Trunk Highway D, and an abandoned railroad corridor to USH 45 at N146. From N146, the Proposed Route follows USH 45 to the existing ATC transmission line ROW at N103 to the Werner West Substation at N143. The Clintonville - Werner West 138 kV Transmission Line is co-located with the Morgan - Werner West 345 kV Transmission Line from N125 to N143. It then would follow an 80-foot-wide existing transmission line ROW, using existing transmission structures, from N125 to N110 and on to the Clintonville Substation, N105.

Alternate Route (~52 miles). The Alternate Route, approximately 52 miles in length, shares several common segments with the Proposed Route. The Alternate Route is located on existing transmission line ROW and/or along state highways from the existing Morgan Substation at N140 southwest to the intersection of the existing ATC 138 kV transmission line designated KK86504. From this intersection, the Proposed Route follows STH 22 and/or Line KK86504 and the existing ATC 138 kV transmission line designated Line KK86502 south to N125. From N125, the Alternate Route consists of mostly new ROW on agricultural land south to the Werner West Substation at N143.

Other Segments. There are several additional segments (N91-N83, N114-N121-N118, N82-N83, N82-N150, N66-N59-N55, N55-N74, N136-N137, N97-N145, N139-N149-N100, and N110-N146) that can also be used to route between the Morgan Substation, proposed Central Wisconsin Switching Station, and proposed Werner West Substation. These segments, while possible transmission line locations, utilize second and fourth priority corridors according to the energy policy statute. WIS. STAT. § 1.12(6)(2003).

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. Approximately eight miles of the Proposed Route will require new right-of-way and approximately seventeen miles of the Alternate Route will require new right-of-way.

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):

- **N140-N91 (0.9 miles)** (Proposed and Alternate routes) is a 120-foot-wide new transmission line ROW out of the Morgan Substation south through agricultural fields until it intersects the existing transmission line corridor. ATC proposes to build single-circuit steel pole structures.

- **N76-N144 (4.7 miles)** (Proposed and Alternate routes) is a 120-foot-wide new ROW on agricultural land. ATC proposes to build double-circuit steel single pole structures.

- **N144-N97 (0.5 miles)** (Proposed Route) is a 120-foot-wide new ROW to County Trunk Highway D. A new 45-foot-wide ROW south along County Trunk Highway D would be immediately adjacent to and parallel to the existing road. ATC proposes to build double-circuit steel single pole structures with the 345 kV conductors on the road side of the structures.

- **N136-N139 (1.8 miles)** (Proposed Route) is a 120-foot-wide new ROW to the intersection of the abandoned railroad corridor. This segment then follows the existing 100-foot-wide abandoned railroad corridor to N139. Approximately 0.4 miles of this segment would be on new ROW, and 1.4 miles would be a shared corridor. ATC proposes to build double-circuit steel single pole structures on the new 120-foot-wide ROW and the 100-foot-wide abandoned railroad corridor.

- **N125-N148 (0.6 miles)** (Alternate Route) is a 120-foot-wide new ROW through rural areas. ATC proposes to build double-circuit steel single pole structures.

- **N144-N145 (0.2 miles)** (Alternate Route) is a 120-foot-wide new ROW on agricultural land. ATC proposes to build double-circuit steel single pole structures.

- **N145-N137 (3.6 miles)** (Alternate Route) is a 120-foot-wide new ROW on agricultural land. ATC proposes to build double-circuit steel single pole structures.

- **N137-N143 (7.0 miles)** (Alternate Route) is a 120-foot-wide new ROW on agricultural land to the Werner West Substation. ATC proposes to build double-circuit steel single pole structures.

- **N91-N83 (22.2 miles)** (not part of Proposed or Alternate Route) is a combination of a 45-foot-wide new ROW along roads and a 120-foot-wide new ROW through rural areas that provides an alternative between the Morgan Substation and N83 on the Proposed Route. ATC would build double-circuit steel single pole structures with the 345 kV conductors on the road side of the structures.

- **N114-N121-N118 (3 miles)** (not part of Proposed or Alternate Route) is a combination of a 45-foot-wide new ROW along roads and a 120-foot-wide new ROW through rural areas in the vicinity of the Pensaukee River. ATC would build double-circuit steel single pole structures with the 345 kV conductors on the road side of the structures.

- **N55-N74 (5.9 miles)** (not part of Proposed or Alternate Route) is a 120-foot-wide new ROW that would provide another connection between the Clintonville Substation and the other alternate Central Wisconsin Switching Station site (currently the Englehardt property, west of N55). This segment consists of road ROW and new ROW in rural areas. ATC would build double-circuit steel single pole structures on the new ROW, and when along the road ROW, double-circuit 345 kV single pole steel structures with the 345 kV conductors on the road side of the structures.

- **N110-N146 (20.4 miles)** (not part of Proposed or Alternate Route) is predominantly a 120-foot-wide new ROW that creates a western route around Clintonville to the southern end of the Project along US Highway 45. ATC would build double-circuit steel single pole structures on the new 120-foot-wide ROW, and when along the road ROW, double-circuit 345 kV single pole steel structures with the 345 kV conductors on the road side of the structures.

- **N139-N149-N100 (1.3 miles)** (not part of Proposed or Alternate Route) is a 120-foot-wide new ROW providing an alternative to the Proposed Route. ATC would build double-circuit single pole steel structures.

- **N136-N137 (0.3 miles)** (not part of Proposed or Alternate Route) is a 45-foot-wide new ROW along County Trunk Highway F and a 120-foot-wide new ROW where no road is paralleled. This segment provides an alternative to transition from the Proposed Route to the Alternate Route. ATC would build double-circuit steel single pole structures on the new 120-foot-wide ROW, and when along the road ROW, double-circuit 345 kV single pole steel structures with the 345 kV conductors on the road side of the structures.

5.04.1.B Existing Right-of-Way

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):

- **N91-N114 (3.4 miles)** (Proposed and Alternate routes) is a 120-foot-wide existing transmission line ROW through rural properties. ATC proposes to rebuild the single-circuit wood H-frame structures as steel double-circuit single poles on the existing ROW.

- **N114-N118 (2.8 miles)** (Proposed and Alternate routes) is a 120-foot-wide existing transmission line ROW through rural properties. ATC proposes to rebuild the single-circuit wood H-frame structures as steel double-circuit single poles on the existing ROW.

- **N118-N85 (7.8 miles)** (Proposed and Alternate routes) is a 120-foot-wide existing transmission line ROW through rural properties to the existing White Clay Substation. ATC proposes to rebuild the single-circuit wood H-frame structures as steel double-circuit single poles on the existing ROW. From the White Clay Substation to N85 is an existing 60-foot-wide ROW through rural properties. ATC proposes to rebuild the existing double-circuit wood single pole structures as double-circuit steel single pole structures with distribution underbuild on the existing ROW. An additional 60 feet of ROW is required.

- **N85-N83 (2.3 miles)** (Proposed Route) is a 50-foot-wide existing gas pipeline ROW through rural properties. ATC proposes to build single-circuit steel single poles adjacent to the pipeline requiring an additional 72 feet of new ROW.

- **N83-N150 (0.9 miles)** (Proposed Route) is a 50-foot-wide existing gas pipeline ROW through rural properties. ATC proposes to build single- circuit steel single poles adjacent to the pipeline requiring an additional 72 feet of new ROW.

- **N150-N79 (4.9 miles)** (Proposed Route) is a 50-foot-wide existing gas pipeline ROW through rural properties. ATC proposes to build single-circuit steel single poles adjacent to the pipeline requiring an additional 72 feet of new ROW.

- **N79-N66 (4 miles)** (Proposed Route) is a 100-foot-wide existing transmission line ROW for the 138 kV line designated W-75 through rural areas. ATC proposes to rebuild the single-circuit wood H-frame structures as double-circuit steel single poles, and most of the line will be located on the existing ROW.

- **N66-N74 (6.3 miles)** (Proposed and Alternate routes) is a 44-foot-wide existing 138 kV ROW (KK86502) immediately adjacent to and co-located with the existing road ROW. ATC proposes to rebuild the double-circuit (one circuit installed) steel single pole

structures as double-circuit steel single pole structures with the 345 kV circuit toward the highway on the existing ROW. In the area of the Village of Embarrass, the line will be rebuilt on the existing 80-foot transmission line ROW with double-circuit steel single pole structures. An additional 40 feet of new ROW will be required.

- **N74-N125 (0.4 miles)** (Proposed and Alternate routes) is a 44-foot-wide existing 138 kV ROW (KK86502) immediately adjacent to and co-located with the existing road ROW. ATC proposes to rebuild the double-circuit (one circuit installed) steel single pole structures as double-circuit steel single pole structures with the 345 kV circuit toward the highway on the existing ROW.

- **N125-N76 (1.1 miles)** (Proposed Route) is a 50-foot-wide existing gas pipeline ROW through rural properties. ATC proposes to build double-circuit steel single poles adjacent to the pipeline requiring an additional 72 feet of new ROW.

- **N103-143 (1.4 miles)** (Proposed Route) is a 205-foot-wide existing transmission line ROW between US Highway 45 and the Werner West Substation. ATC proposes to rebuild the existing lines on double-circuit steel single pole structures and then add the new 345 kV and 138 kV lines on the same ROW, also using double-circuit steel single pole structures. An additional 10 feet of new ROW is required.

- **N125-N110-N105 (0.9 miles)** (Proposed and Alternate routes) is an 80-foot-wide existing transmission line ROW. ATC proposes utilizing the existing structures for the Clintonville – Werner West 138 kV Transmission Line.

- **N85-N82 (3.1 miles)** (Alternate Route) is a 60-foot-wide existing transmission line ROW through rural areas. ATC proposes to rebuild the existing double-circuit wood structures as double-circuit steel single pole structures with distribution underbuild on the existing ROW. An additional 60 feet of new ROW is required.

- **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.

- **N66-N59-N55 (2.9 miles)** (Alternate 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. (Note that this is part of the Proposed Route of the Gardner Park – Central Wisconsin Project. It would be constructed as part of the Morgan – Werner West Project if the Alternate Central Wisconsin Switching Station site, near N55, is selected.)

5.04.1.C Corridor Sharing

A portion of the Alternate Route, the segment N82-N62, would be located in or along the STH 29 ROW, and both the Proposed and Alternate routes would be located, in part, along the STH 22 ROW. As noted above, ATC worked with the WisDOT in an effort to locate as much of this portion 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 easement rights from adjacent property owners.

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):

- **N139-N100 (1.2 miles)** (Proposed Route) is a 100-foot-wide abandoned railroad corridor. ATC proposes to construct double-circuit steel single pole structures on the corridor.

- **N100-N146 (2.8 miles)** (Proposed Route) is a 100-foot-wide abandoned railroad corridor. ATC proposes to construct double-circuit steel single pole structures on the corridor.

- **N146-N103 (.4 miles)** (Proposed Route) is a 45-foot-wide new ROW immediately adjacent to and co-located with the existing US Highway 45 ROW. ATC proposes to build double-circuit steel single pole structures with the 345 kV conductors on the road side of the structures.

- **N148-N76 (.8 miles)** (Alternate Route) is a 45-foot-wide new ROW along STH 156. ATC proposes to build double-circuit steel single pole structures with 345 kV conductors toward the road.

- **N144-N97 (.5 miles)** (Proposed Route) is a 120-foot-wide new ROW to County Trunk Highway D. A new 45-foot-wide ROW south along County Trunk Highway D would be immediately adjacent to and co-located with the existing road. ATC proposes to build double-circuit steel single pole structures with the 345 kV conductors on the road side of the structures.

- **N97-N136 (3.5 miles)** (Proposed Route) is a 45-foot-wide new ROW immediately adjacent to and co-located with the existing County Trunk Highway D ROW, to just north of County Trunk Highway F. At this point, a new 120-foot-wide ROW is required to N136. ATC proposes to build double-circuit steel single pole structures with the 345 kV conductors on the road side of the structures.

- **N82-N62 (5.3 miles)** (Alternate Route) is a nominal 50-foot-wide new ROW adjacent to and co-located with the existing STH 29, Shawano Bypass ROW. ATC proposes to build single-circuit steel single pole structures along STH 29 with conductors toward the highway.

- **N82-N83 (.8 miles)** (not part of the Proposed or Alternate Route) is a nominal 50-foot-wide new ROW adjacent to STH 29 that provides a crossover between the Proposed and Alternate routes. ATC would build 345 kV single-circuit steel single pole structures with conductors on the road side of the structures.

- **N82-N150 (.8 miles)** (not part of the Proposed or Alternate Route) is a 45-foot-wide new ROW along County Trunk Highway T that provides an alternative to the Proposed and Alternate routes.

ATC would build 345 kV single-circuit steel single pole structures with conductors on the road side of the structures.

- **N97-N145 (.2 miles)** (not part of the Proposed or Alternate Route) is a 45-foot-wide new ROW along a road that provides an alternative to transition from the Proposed Route to the Alternate Route. ATC would build 345 kV single-circuit steel single pole structures with conductors on the road side of the structures.

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 public ROW, and where access to private property could be obtained, were field-survey inventoried. Field inventories, supplemental to initial field reconnaissance effort concluded in early 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 cumulatively traverse over five acres of 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 N82-N85) would traverse less than 0.5 miles (approximately 3.0 acres in area) of land owned by Shawano County, not including highway crossings.

5.04.2.F State Properties

A segment of the Proposed Route (N83-N85) would traverse less than a half mile of lands administered by the WDNR. Along the abandoned railroad corridor (N100-N139-N136), the Proposed Route traverses approximately 0.3 miles, or 3.6 acres, of lands administered by the WDNR. The Alternate Route would traverse less than a half-mile of lands administered by the WDNR between nodes 82 and 85. An other segment alternative, N83-N91, would traverse less than a half mile of lands administered by the WDNR. Along STH 29, the WisDOT ROW will be utilized to the maximum extent allowable for the construction of the

Alternate Route. Along STH 22 and US Highway 45, 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 2.2 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 0.2 miles, or one acre, of residential use lands. N110-N146 would traverse approximately 0.8 miles, or 4.4 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 in 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

No center-pivot irrigation systems were identified. ATC will work with landowners to avoid disruption of current farming practices.

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 Shawano or Oconto 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 Program and the Managed Forest Land Program (MFL). *See* WIS. STAT. Ch. 77 (2003). The MFL replaced the Woodland Tax Law and the Forest

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

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. The Clintonville

Municipal Airport is approximately one mile west of the Proposed or Alternate Route (N76-N144). The landing strip oriented in a northeast to southwest direction. It is the closest airport or landing strip to any route segment or segment alternative. ATC's preliminary engineering indicates that the proposed transmission line will comply with all regulations related to the airport. Upon the final selection of a route and more detailed engineering, ATC will submit the appropriate information to the FAA for confirmation that the Project will not create a hazard to aircraft, or impact airport safety and operations, by complying with FAA and WisDOT height restrictions.

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)

No substation construction included in the proposed Project will disturb more than one acre of land. The proposed expansion of the Morgan Substation is slightly less than one acre, but ATC has nonetheless made application for the Storm Water Discharge permits in its WDNR Utility Permit Application under *Wis Stat*. § 30.025 (1s). 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. The improvements to the Clintonville and Badger substations would be within the existing fence, and the improvements to the Werner West Substation would be within the fence as proposed in Docket No. 137-CE-134. 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 the expansion of the Morgan Substation is presented in Appendix H-4. 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 substation (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 expansion of the existing Morgan Substation 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 the expansion of the Morgan Substation, some graded material may be temporarily stockpiled at the substation site. The precise location and amount of material of stockpiles is not known at this time. Stockpiled materials will be managed in such a manner as to minimize impacts to water bodies, roads, and sensitive environments. Stockpiled materials will be managed as provided 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 Morgan Substation site and will likely be installed soon after delivery. None of the equipment has the potential to spill potential contaminants as all substation 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 along any of the potential routes. 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

It is unknown at this time if contaminated materials exist at any area to be excavated. 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

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 protective mats before removal to a suitable upland site by truck.

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 Werner West, Clintonville, Badger, and Morgan substations. An application to construct the Werner West Substation has been submitted to the Commission in Docket 137-CE-134. Refer to Appendix H-1 for the substation plan view drawings.

5.06.2 Size and Orientation

The Werner West Substation will require the installation of a new 345 kV line terminal, and other associated facilities. The existing bus is designed for the additional terminal in its ring bus configuration. No expansion of the previously proposed fence is required. The control house will be used to house the new relay and control panels, and communication equipment. The previously proposed 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, and disconnect switches will be designed for 3000 Amps continuous. Three surge arrestors will be installed on the outgoing line to Morgan Substation. Fiber optic communications will be used for one independent relay channel with Power Line Carrier used for the other channel.

A new 138 kV terminal will also be added at Werner West for the line to Clintonville. A 138 kV line disconnect and bus will be required. The 138 kV disconnect will be sized for 2000 Amps continuous, and the bus will be designed for 3000 Amps continuous. The planned AC and DC electrical systems will have the capacity for the new 138 kV facilities.

The Morgan Substation will require the addition of one new 345 kV line terminal, two 345 kV breakers and associated disconnects and other associated equipment. The new circuit breakers, disconnect switches and bus will be sized for 3000 Amps continuous. Three new surge arrestors will be installed on the new line terminal. Six capacitor coupled voltage

transformers (CCVTs) will be installed to provide protective relaying and control.

The existing 24-foot by 44-foot control building will be used to house the new relay panel and control equipment. The existing AC and DC systems equipment will be utilized to support the new equipment. An addition to the existing fenced area of 145 feet by 205 feet will be required to accommodate the new facilities. This can be accomplished on the existing parcel, which is over eleven acres in area, that is owned by ATC.

The Clintonville Substation will require the installation of a new 138 kV line terminal plus two circuit breakers and associated equipment. Two new 138 kV circuit breakers will be installed along with associated disconnect switches and bus. The circuit breakers, disconnect switches, and bus will be sized for 2000 Amps continuous. Three new surge arrestors will be installed on the line from Werner West. Communication will be by fiber optics for Clintonville to Werner West substations and by either Power Line Carrier or fiber optics from Clintonville to Badger. A line position in the Badger line will be modified to remove 25 feet of bus and replace a bus support with a disconnect switch on the existing stand.

The new facilities will fit in the existing 305-foot by 280-foot substation fenced area owned by BPMA. ATC will obtain and easement for its new facilities from Badger Power Marketing Authority.

The existing control building will be used for the new control and relay panel required as well and a new ATC supervisory control and data acquisition (SCADA) system. The existing AC and DC electrical systems will be used for the new equipment, relay panels, Communication, and SCADA.

The Badger Substation will require a fiber optic connection to the Central Wisconsin Switching Station (proposed in Docket No. 137-CE-122). ATC proposes to install a CCVT and a fiber optic communication cabinet and fiber optic communications capability in the existing Badger Substation control house. The existing AC and DC electrical systems have adequate panel space and will be used by the new equipment, protective relay panels, and communications equipment. This will not require physical expansion of the Badger Substation.

5.06.3 Landscaping

No special landscaping provisions have been made due to the character of the surrounding area. All substation sites are already in use as substations.

5.06.4 Ownership and Topography

All substation sites that require modification are owned by ATC. Upon approval of the Project, a detailed survey will be completed to establish site elevations for construction planning and stormwater management design.

5.06.5 Transmission Lines and Structures

Existing and proposed transmission line structures are shown on the figures in Appendix H-1.

5.06.6 Access Roads

The transmission lines and structures on each of the proposed substation sites is depicted on Appendix H-1, Figures 1 through 4.

5.06.7 Construction Procedures

This project includes modifications to the existing Morgan Substation and to the Werner West Substation proposed in Docket 137-CE-134, as well as some modifications to the Clintonville and Badger substations. Preliminary site plans have been developed for the relatively minor modifications to the existing Morgan, Werner West, Clintonville and Badger Substation sites. No site plan has been developed for the Badger Substation because the work anticipated there is only to the communications facilities. Erosion control plans for the substations 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 substation area indicates sufficient space for the site modifications, 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.

No similar plan has been made for Badger Substation, as the only modifications relate to the fiber optic connections.

5.06.8 Environmental Information

American Transmission Company does not anticipate any effect on the environment at the existing Morgan, Werner West, Badger, or Clintonville substations. The expansion area at the Morgan Substation site is less than one acre in area, and is presently used for row crop production.

5.07 (1-3) EMF INFORMATION

Magnetic field calculations were performed using the ENVIRO program developed by the Electric Power Research Institute (EPRI). In addition,

magnetic field measurements were taken at Morgan and Clintonville substations. This information is 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 (2004)(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 Route as well as other segments that could be used to modify the routes. Section 5.02 and Appendix E-1 provide additional detail regarding the Proposed Route, the Alternate Route, and other segments. 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, 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 Project. 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).

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 Wisconsin Natural Heritage Inventory 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. Morgan-Werner West 345 kV Transmission Line, Project Planning Document, dated 01/03/05

B-2. NPV Analysis of System Losses

APPENDIX C – EMF STUDIES

C-1. EMF Segment Map

C-2. EMF Cross-reference table

C-3. EMF Readings, Morgan Substation

C-4. EMF Readings, Clintonville Substation

Figures 1-39

Tables 1-19

APPENDIX D – AGENCY CORRESPONDENCE

D-1. Letter of March 2, 2005 to WDNR

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

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 AND 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. Substation Layout Diagrams

- Exhibit 1 Morgan Substation
- Exhibit 2 Clintonville
- Exhibit 3 Werner West - Schmude Property
- Exhibit 4 Werner West - Frederick Property

H-2. One-line diagram(s)

H-3. Preliminary Construction Schedule

H-4. Substation Conceptual Erosion Control Plan, Morgan Substation

H-5. Cost Estimates 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)