BEFORE THE
PUBLIC SERVICE COMMISSION OF WISCONSIN

Joint Application of American Transmission Company, ITC Midwest LLC, and Dairyland Power Cooperative for Authority to Construct and Operate a New 345 kV Transmission Line from the Existing Hickory Creek Substation in Dubuque County, Iowa, to the Existing Cardinal Substation in Dane County, Wisconsin, to be Known as the Cardinal-Hickory Creek Project	05-CE-146

MOTION FOR EIS SUPPLEMENT TO INCLUDE HIGHWAY 151 ROUTE

JEWELL JINKINS INTERVENORS

On April 26, 2019, Alexander J. Vedvik, electrical engineer in the Division of Energy Regulation Public Service Commission of Wisconsin, submitted Direct Testimony in the above-captioned docket. In this testimony, he proposed a route alternative along U.S. Highway 151 corridor. Direct-PSC-Vedvik-25-26. This route alternative was discussed in the Environmental Impact Statement, but not in enough detail for the Commission to formally consider it as a route. The EIS stated that "If the proposed Hill Valley Substation could instead be placed in the Platteville area, the USH 151 corridor from Platteville to Dodgeville could be a viable route alternative that may have a lower cost than Western-South and may have less associated impacts than Western-North." EIS-PSC-31.

This proposal of an alternative is significant new information which is relevant to environmental concerns and has bearing on the transmission project proposed -- it provides a

means to avoid substantial impacts to Wisconsin agricultural landowners potentially affected by other routes and it does so at a nominal cost to Wisconsin electric customers due to the MISO MVP cost allocation scheme, which would allocate only a small percentage of increased cost to Wisconsin electric customers. In short, Wisconsin would benefit through fewer harmful impacts achieved at a relatively low cost. This is sufficient reason to supplement the EIS. Wis. Code PSC 4.35 (2)(a)1, 2. The purpose of an EIS is to address alternatives to the proposed action and should "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available." Wis. Stat. §1.11(2)(c)3; Wis. Stat. §1.11(2)e. This route is a reasonable alternative that could provide benefits to Wisconsin landowners that outweigh the nominal costs to Wisconsin electric customers.

With this Motion, Jewell Jinkins Intervenors requests that the U.S. Highway 151 alternate route from a Platteville, Wisconsin Hill Valley Substation along U.S. Highway 151 to Dodgeville, towards the Cardinal substation be fully developed and analyzed in a supplement to the Environmental Impact Statement. Because the Final EIS has been issued, JJI requests that the commission prepare both a draft Supplement and a final as required by rule. Wis. Code PSC 4.35(2)c.

Some of the specifics of the route were described by Vedvik in his Direct testimony:

Q. Are there any other locations where the applicants considered siting the proposed Hill Valley Substation in southwestern Wisconsin?

A. Ex.-PSC-Data Request: Response 4.73 stated that ATC considered siting the intermediate substation adjacent to: the Dodgeville 69 kV Substation; the Darlington 138 kV Substation; or, the Eden 138/69 kV Substation. The applicants provided various reasons as to why the Montfort, Wisconsin area was selected as the best available option of these three locations for siting the intermediate substation, namely that locating the substation near Dodgeville or Darlington would be more expensive due to the need to construct

additional transmission lines in Dodgeville, and the fact that Darlington would require an extensive amount of additional 345 kV transmission line construction. Ex.-PSC-Data Request: Response 8.1 stated that another potential site adjacent to the existing Hillman 138/69 kV Substation in Platteville, Wisconsin area was excluded from consideration. However, given the apparent lack of electrical constraints, a location like Platteville would potentially avoid transmission routing challenges created by the topography of the proposed route alternatives and may impact project costs.

Q. If the proposed Hill Valley Substation were to be located in the Platteville, Wisconsin area, as opposed to the Montfort, Wisconsin area, how could this impact the general routing of the proposed Cardinal-Hickory Creek project and its cost?

A. Locating the intermediate substation in the Platteville, Wisconsin area would enable additional routing options for the 345 kV transmission line from the proposed Hill Valley Substation to the Cardinal Substation. One route for study that is electrically viable could include the U.S. Highway 151 corridor from Platteville, Wisconsin to Dodgeville, Wisconsin. For purposes of assessing whether the location of the Hill Valley substation could have a meaningful impact on the proposed project's costs, I assumed a hypothetical route that would follow the applicants' alternative route from Cassville, Wisconsin to a new Hill Valley Substation located near Platteville, Wisconsin, then follow the U.S. Highway 151 corridor from Platteville, Wisconsin to Dodgeville, Wisconsin, and then follow the applicants' preferred route along the U.S. Highway 151 corridor from there on.

Ex.-PSC-Data Request: Response 8.3[31] states that this route would add approximately 5.5 miles of 345 kV transmission line, as compared to the applicants' preferred route. The applicants' applied an approximately $3.6 million/mile cost to calculate the cost of this route to be $19.8 million more than the preferred route. However, the applicants have pointed out that as the project is eligible for MVP cost sharing, this $19.8 million increase in capital cost would cost Wisconsin transmission network customers approximately $2 million on a net present value basis. The applicants' alternative route is approximately $51 million more than the applicants' preferred route.

Q. Would siting the proposed Hill Valley Substation adjacent to, and electrically connected to, the existing Hillman 138 kV Substation in the Platteville, Wisconsin area, impact the performance of the proposed Cardinal-Hickory Creek project?

A. No. Ex.-PSC-Data Request: Response 8.2 provided PowerWorld modeling of the proposed Cardinal-Hickory Creek project, with the proposed Hill Valley Substation located adjacent to the Hillman 138/69 kV Substation. The applicants' response also states that "changing the intermediate

> substation location from Montfort to Platteville would not impact the avoided reliability benefits included in the joint application." In summary, siting the proposed Hill Valley Substation adjacent to the Hillman 138/69 kV Substation would not impact the performance or general electrical characteristics of the proposed Cardinal-Hickory Creek project.

Direct-PSC-Vedvik-25-26 (fn. omitted); see Ex.-PSC-Data Request: Response 8.1; Ex.-PSC-Data Request: Response 8.2 and Ex.-PSC-Data Request: Response 8.3, attached.

The proposed route, its practicality, electrical impact, and PowerWorld modeling as described by PSC staff and applicants' Data Request responses showed that siting of the substation "would not impact the performance or general electrical characteristics of the proposed Cardinal-Hickory Creek project.

The later released Final Environmental Impact Statement had the following comments regarding this Highway 151 route alternative:

> The applicants' stated in the response to Data Request 8.1 that they "did not consider a new 345/138 kV substation in the vicinity of the Hillman 138/69 kV Substation in Platteville, Wisconsin. The Montfort/Eden Substation area is stronger electrically and is therefore better situated to provide regional support to the ATC system." The applicants' response to Data Request 8.2 included PowerWorld modeling with the proposed Hill Valley Substation located in the Platteville area. The modeling showed no significant changes to power flows in southwestern Wisconsin. The applicants' response states that "based on these results, changing the intermediate substation location from Montfort to Platteville would not impact the Avoided Reliability Benefits included in the Joint Application." If the proposed Hill Valley Substation could instead be placed in the Platteville area, the USH 151 corridor from Platteville to Dodgeville could be a viable route alternative that may have a lower cost than Western-South and may have less associated impacts than Western-North. This route alternative was not considered by the applicants.
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> The applicants siting process included a multi-stage process to narrow the initial project corridor down to the proposed route alternatives presented in docket 5-CE-146. As stated by the applicants, the preliminary route corridors were based on the siting priorities listed in Wis. Stat. § 1.12(6).

FEIS-PSC-31 (fn. omitted) (see Ex.-PSC-Data Request: Response 8.1. 8.2 and 8.3, attached).

> Locating the intermediate substation in the Platteville area could enable additional routing options for the 345 kV transmission line from the proposed substation to the Cardinal Substation. One such route could include the USH 151 corridor from Platteville to Dodgeville. For purposes of assessing whether the location of the proposed substation could have a meaningful impact on project costs, this route alternative could follow Western-South from Cassville to a new substation near Platteville, then follow the USH 151 corridor from Platteville to Dodgeville, and then follow Eastern-South along the USH 151 corridor from there on. The applicants' response to Data Request 8.3 states that this route would add approximately 5.5 miles of 345 kV transmission line, as compared to the Western-North with Eastern-South alternative.
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> The estimated total increase in cost for such an option is estimated to be approximately $19.8 million, for a total estimated cost of approximately $512 million. For comparison, this route would be less costly than any route alternative supplied by the applicants that uses the entire Western-South route from Cassville to Montfort, since the lowest cost proposed route alternative involving Western-South is estimated to be approximately $51 million more than using the Western-North with Eastern-South alternative. Wis. Stat. § 1.12(6) requires as a first priority use of existing utility corridors to the greatest extent feasible for new transmission lines. The second-highest priority listed in Wis. Stat. § 1.12(6) is highway and railroad corridors. Much of Western-North is existing transmission corridor, and the USH 151 corridor is a highway corridor.

FEIS-PSC-31-32 (fn. omitted)(see Ex.-PSC-Data Request: Response 8.1. 8.2 and 8.3, attached)..

> Commission staff worked with the applicants to refine their PowerWorld modeling to ensure that it accurately reflects the configuration of the current electric system, specifically around the proposed new Nelson Dewey Mississippi River crossing location in the models, and other changes proposed as part of the Cardinal-Hickory Creek project. The applicants' response to Data Request 8.2 stated that "changing the intermediate substation location from Montfort to Platteville would not impact the Avoided Reliability Benefits included in the Joint Application." If the proposed Hill Valley Substation could be located in the Platteville area with no change to the electrical performance of the Cardinal-Hickory Creek project, then the USH 151 corridor from Platteville to Dodgeville could be a viable route alternative.
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> In order to consider such a route, potentially affected landowners along the corridor would need to be given notice in this proceeding, and the applicants would need to develop a route alternative that follows this corridor. For the Commission to authorize such a route, the route would need to fit within the siting priorities listed in Wis. Stat. § 1.12(6). The proposed Cardinal-Hickory Creek project would likely be delayed due to the time required to develop this route alternative and give landowners along this possible route alternative notice and a

> chance to participate in the CPCN process. While it is unknown how much this could delay the in-service date of the proposed Cardinal-Hickory Creek project, a delay in the in-service date could impact the costs and benefits associated with the proposed Cardinal-Hickory Creek project.

FEIS-PSC-93-94 (fn. omitted)(see Ex.-PSC-Data Request: Response 8.1. 8.2 and 8.3, attached).

And finally, in the FEIS summary:

> If the proposed Hill Valley Substation could instead be placed in the Platteville area, the USH 151 corridor from Platteville to Dodgeville could be a viable route alternative that may have a lower cost than Western-South and less associated impacts than Western-North. This route option was not considered by the applicants. The applicants siting process for the proposed project is discussed in Section 2.1. In order for the Commission to consider such a route, potentially affected landowners along the corridor would need to be given notice in this proceeding, and the applicants would need to develop a route alternative that follows this corridor. For the Commission to authorize such a route, the route would need to fit within the siting priorities listed in Wis. Stats. 1.12(6).

FEIS-PSC-538.

Because this route alternative, as a highway corridor, falls within the siting priorities listed in Wis. Stats. 1.12(6), and because of the benefits of this routing alternative proposed by PSC staff to Wisconsin landowners relieved of route alternatives on new corridors, and because this route alternative is only described, but not fully analyzed in the FEIS, the FEIS should be supplemented with a thorough analysis of this alternative.

Noteworthy is that this alternative route is one raised by PSC staff and demonstrated through modeling by applicants to not have a detrimental impact on avoidable reliability benefits, performance or electrical characteristics. This is not a last minute Intervenor's back-of-the-napkin route alternative tossed out by intervenors seeking to delay the process – PSC staff developed this information over time through analysis of the application and presentation of scenarios in Data Requests with applicant modeling demonstrating its potential.

A route alternative with the benefits as described above should have been incorporated

into the EIS immediately upon discovery, and although the PSC had this information, it was not. The hearing has not yet been held, and there has been no determination by the Commission regarding the adequacy of the EIS. At this point, it is only "progress towards compliance with the Public Service Commission's requirement under Wis. Stat. § 1.11 and Wis. Admin. Code § PSC 4.30." PSC statutes, regulations, rules and the EIS state that for the Commission to consider a route alternative, potentially affected landowners along the corridor would need to be given notice in this proceeding, and the applicants and the Commission would need to develop a route alternative that follows this corridor. That work has only been described in the EIS and not yet been done, and should be, post haste. The Commission should not let this reasonable, viable, and economic route alternative be rejected by default.

At this time, Jewell Jinkins Intervenors request an Order directing PSC staff to immediately supplement the FEIS with a full analysis of the Highway 151 route alternative, from Platteville, Wisconsin and the proposed Hill Valley Substation along U.S. Highway 151 to Dodgeville, Wisconsin, as provided by PSC 4.35 (2)(a)1 and PSC 4.35(2)(a)2, which requires both a draft Supplement and a final Supplement to the Environmental Impact Statement.

Dated this 28th day of May, 2019.

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CARDINAL-HICKORY CREEK PROJECT
Docket No. 05-CE-146

Response to PSCW Data Request 8.1

Data Request No. 8.1:

The applicants' response to Data Request 4.73 (PSC REF#: 354949) states that they considered siting the proposed Hill Valley Substation adjacent to the existing 138/69 kilovolt (kV) Eden Substation, the existing 69 kV Dodgeville Substation, and the existing 138/69 kV Darlington Substation. In addition, the applicants' response to Data Request 4.74 (PSC REF#: 353712) states that following U.S. Highway (USH) 151 would unnecessarily add cost to the proposed Cardinal-Hickory Creek project due to the need to construct an additional 138 kV transmission line.

Explain whether the applicants considered siting the Hill Valley Substation in the Platteville, Wisconsin area which has significant existing 138 kV infrastructure. If the Platteville area was not considered, or considered and rejected as a siting option for the Hill Valley Substation, provide reasons for doing so.

Response to Data Request No. 8.1:

The Applicants did not consider siting a new 345/138 kV substation in the vicinity of the Hillman 138/69 kV Substation in Platteville, Wisconsin. The Montfort/Eden Substation area is stronger electrically and is therefore better situated to provide regional support to the ATC system. While both the Hillman and Eden substations have a 138 kV connection, the Eden Substation supports three networked 69 kV lines within the ATC network: one going toward Dodgeville, one going toward Mineral Point, and one toward Platteville via the Belmont area. The Hillman Substation supports two networked 69 kV lines: one connects to the Eden Substation via the Belmont area, the other goes south to Illinois.

Steady State Reliability Results Update for Data Requests 8.2

The Applicants made the following changes to the 2027 90/10 Summer Peak and 2027 West-to-East Bias Shoulder reliability models originally provided as the Updated Reliability Analysis (PSCW REF#: 350642) that was requested by the PSCW in the first set of data requests (described in more detail in PSCW Ref. #347526).

1. Transmission Updates
    a. Move the Hill Valley 345/138 kV substation from Montfort (connected to Eden 138 kV) to Platteville (connected to Hillman 138 kV).
    b. Update the Hickory Creek – Hill Valley – Cardinal 345 kV line impedance data to represent the change in line length.

2. Generator Updates
    a. None

3. Load Updates
    a. None

After making these changes, the Applicants then performed DC contingency analysis on the updated models as described in the following sections.

The associated results are in the columns titled "CHC HLM" in the tables that follow. For comparison purposes, the results of the Updated Reliability Analysis (PSCW REF#: 350642) are listed as "NA Sept18" and "CHC Sept18" for the No-Action alternative and Cardinal – Hickory Creek alternative, respectively.

Summary of Updated Reliability Results

In comparison to the updated results provided in September 2018, the Cardinal – Hillman – Hickory Creek 345 kV alternative performs similarly in terms of the overloaded branches except that it results in slightly greater loading on these elements for each of the worst contingencies. More specifically, the following table shows the overloaded branches in the updated analysis.

Table 1 – Overloaded Branches for No Load Loss Allowed Contingencies

		Worst Branch Flow (%)		
Monitored Branch [1]	Rating (MVA)	NA Sept18	CHC Sept18	CHC HLM
Turkey River – Stoneman 161 kV	248.0	115.7	73.2	75.4
Stoneman – Nelson Dewey 161 kV	221.0	121.8	72.1	75.1
West Middleton – Timberlane Tap 69 kV	86.0	101.8	96.8	101.4
Portage – Columbia 138 kV ckt 2	335.0	109.8	104.3	110.7
Portage – Columbia 138 kV ckt 1	335.0	109.7	104.3	110.7
Columbia 138/69 kV	96.0	98.1	100.1	101.5
Columbia 345/138 kV ckt 2	527.0	99.4	96.9	101.9

1. Branches only shown if there is an alternative with loading greater than or equal to 100%.

In sum, based on these results, changing the intermediate substation location from Montfort to Platteville would not impact the Avoided Reliability Benefits included in the Joint Application.

Steady State Reliability Results Tables for 2027 90/10 Summer Peak

Steady state thermal results are presented for the worst contingency for each monitored branch if there is at least one alternative, including the No Action Alternative, in which the flow exceeds 90% of the applicable rating. DC contingency analysis was used to identify all Branch Flow (%) values.

Table D-1-7 – Voltage Results for All P0-P7 Contingencies (2027S_90/10)

			Bus Voltage (p.u.)		
Monitored Bus	Worst Contingency	Voltage Limit (p.u.)	NA Sept18	CHC Sept18	CHC HLM
Not Applicable – All updated results were found using DC contingency analysis.					

Table D-1-8 – Thermal Results for P11 Contingencies (2027S_90/10)

			Branch Flow (%)		
Monitored Branch	Worst NLL Contingency	Rating (MVA)	NA Sept18	CHC Sept18	CHC HLM
Turkey River – Stoneman 161 kV	[redacted]	248.0	101.7	61.8	61.9
Stoneman – Nelson Dewey 161 kV	[redacted]	221.0	106.9	60.1	60.7

Table D-1-9 – Thermal Results for P0-P2 Contingencies with No Load Loss Allowed (2027S_90/10)

			Branch Flow (%)		
Monitored Branch	Worst NLL Contingency	Rating (MVA)	NA Sept18	CHC Sept18	CHC HLM
Turkey River – Stoneman 161 kV	[redacted]	248.0	115.7	73.2	75.4
Turkey River – Stoneman 161 kV	[redacted]	223.0	102.2	61.3	64.4
Stoneman – Nelson Dewey 161 kV	[redacted]	221.0	121.8	72.1	75.1
Stoneman – Nelson Dewey 161 kV	[redacted]	201.0	104.8	57.4	61.5
Nelson Dewey 161/138 kV	[redacted]	210.0	90.1	41.0	43.2
Columbia 345/138 kV ckt 1	[redacted]	250.0	90.3	86.6	91.9
Columbia 345/138 kV ckt 2	[redacted]	527.0	99.4	96.9	101.9
Columbia 345/138 kV ckt 3	[redacted]	250.0	90.3	86.6	91.9
Portage – Columbia 138 kV ckt 2	[redacted]	335.0	109.8	104.3	110.7
Portage – Columbia 138 kV ckt 1	[redacted]	335.0	109.7	104.3	110.7
Columbia 138/69 kV	[redacted]	96.0	98.1	100.1	101.5
Kegonsa – Cottage Grove 69 kV	[redacted]	74.0	91.9	91.0	91.4
West Middleton – Timberlane Tap 69 kV	[redacted]	68.0	101.5	84.4	101.4
West Middleton – Timberlane Tap 69 kV	[redacted]	86.0	91.3	96.8	98.9
West Middleton – Timberlane Tap 69 kV	[redacted]	86.0	101.8	86.8	96.9
Timberlane Tap – Stagecoach 69 kV	[redacted]	86.0	91.2	87.4	90.5
Timberlane Tap – Stagecoach 69 kV	[redacted]	86.0	92.3	77.5	88.5
Townline Road – Bass Creek 138 kV	[redacted]	161.0	90.4	65.3	50.9
Paddock 138/69 kV	[redacted]	93.0	94.6	92.1	90.3
Colley Road 138/69 kV	[redacted]	93.0	91.1	91.3	97.7
Colley Road 138/69 kV	[redacted]	135.0	91.3	92.1	95.6
Paddock – Shirland Avenue Tap 69 kV	[redacted]	108.0	92.0	93.7	92.8
Shirland Avenue Tap – Shaw 69 kV	[redacted]	95.0	97.5	98.8	98.9

Steady State Reliability Results Tables for 2027 Shoulder with West-to-East Flow Bias

Steady state thermal results are presented for the worst contingency for each monitored branch if there is at least one alternative, including the No Action Alternative, in which the flow exceeds 90% of the applicable rating. DC contingency analysis was used to identify all Branch Flow (%) values.

Table D-3-1 – Voltage Results for All P0-P7 Contingencies (2027SH_W-E_Bias)

			Bus Voltage (p.u.)		
Monitored Bus	Worst Contingency	Voltage Limit (p.u.)	NA Sept18	CHC Sept18	CHC HLM
Not Applicable – All updated results were found using DC contingency analysis.					

Table D-3-2 – Thermal Results for P11 Contingencies (2027SH_W-E_Bias)

			Branch Flow (%)		
Monitored Branch	Worst NLL Contingency	Rating (MVA)	NA Sept18	CHC Sept18	CHC HLM
No branches were loaded to greater than or equal to 90% with P11 in the 2027SH_W-E_Bias models.					

Table D-3-3 – Thermal Results for P0-P2 Contingencies with No Load Loss Allowed (2027SH_W-E_Bias)

			Branch Flow (%)		
Monitored Branch	Worst NLL Contingency	Rating (MVA)	NA Sept18	CHC Sept18	CHC HLM
Turkey River – Stoneman 161 kV	[redacted]	248.0	92.5	55.3	55.2
Stoneman – Nelson Dewey 161 kV	[redacted]	221.0	95.4	51.9	52.1
East Campus – Walnut 69 kV	[redacted]	100.0	89.7	95.9	93.3

CARDINAL-HICKORY CREEK PROJECT
Docket No. 05-CE-146

Response to PSCW Data Request 8.3

Data Request No. 8.3:

Provide the estimated cost to construct a route alternative that would locate the proposed Hill Valley Substation near Platteville, Wisconsin, in the vicinity of the existing Hillman Substation, electrically connecting the proposed substation to the existing Hillman Substation. Assume that this route in its entirety would follow the applicants' Alternate Route from Cassville to Platteville, USH 151 from Platteville to Dodgeville, and the Preferred Route from Dodgeville to the town of Middleton.

Response to Data Request No. 8.3:

As discussed in response to Data Request 8.1, a substation in the Montfort area is better situated for providing regional support to the ATC network, and the Applicants are not proposing that a substation be located near the existing Hillman Substation.

Assuming a new 345/138 kV substation can be located within a reasonable distance of the existing Hillman Substation and 138 kV transmission lines, approximately 5.5-miles of 345 kV transmission line would be added to the overall length as compared to the Applicants' Preferred Route. Applying an approximate $3.6M/mile cost that was utilized for Segment S, this alternative would cost approximately $20-million more than the Applicants' Preferred Route. Please note that several unknown potential cost impacts have not been accounted for in that value, including reviews or analysis to confirm if:

(1) Segment S and this USH151 section from Dodgeville to Platteville have a similar cost-per-mile when accounting for such detailed characteristics as number of transmission line angle structures, terrain and access, soil type, existing vegetation, and land value;

(2) Whether ATC could sell its recommended Hill Valley site and, in turn, purchase a new site within a reasonable proximity to the Hillman Substation that is similar in size and cost;

(3) All Substation costs (including remote-end) would be unchanged; and

(4) 138 kV connections to the Hillman Substation are of similar scope and cost as those proposed to connect Hill Valley and Eden Substations.