

In the Matter of the Need for the Wheatland Wind Project Connection

And in the matter of the *Electric Utilities Act*, S.A. 2003, c. E-5.1, the *Alberta Utilities Commission Act*, S.A. 2007, c. A-37.2, the *Hydro and Electric Energy Act*, R.S.A. 2000, c. H-16, the Regulations made thereunder, and *Alberta Utilities Commission Rule 007*

Application of the Alberta Electric System Operator for Approval of the
**Wheatland Wind Project Connection Needs
Identification Document Approval Amendment**

Date: February 24, 2022

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PART A - APPLICATION

1 Introduction

1.1 Background – On March 22, 2019, the Alberta Utilities Commission (Commission) approved the Alberta Electric System Operator’s (AESO) *Wheatland Wind Project Connection Needs Identification Document* in Decision 24040-D01-2019 and NID Approval No. 24040-D02-2019 (NID Approval). The Wheatland Wind Project was approved by the Commission on September 7, 2018.¹

In May 2020, the AESO revised its *Guidelines for T-Tap Connections*² and, in consultation with Wheatland Wind Project L.P., by its General Partner, Wheatland Wind Project Ltd., (market participant) and the legal owner of transmission facilities (TFO) in the area, the AESO re-examined the Approved Development and determined a new T-tap connection would be the preferred technical solution. The AESO hereby submits this *Wheatland Wind Project Connection Needs Identification Document Approval Amendment* (Application) to the Commission for approval. This application is submitted in accordance with AUC Rule 007, Section 7.1.2, *Abbreviated Needs Identification Document Application Information Requirements*.

1.2 Application – In accordance with the NID Approval, which states that, “the Commission may review this approval, in whole or in part, upon its own motion or upon application by an interested party, in accordance with Section 10 of the *Alberta Utilities Commission Act*,” the AESO is applying to the Commission to amend the NID approval described below, pursuant to Section 10 of the *Alberta Utilities Commission Act*.

1.3 Application Overview – The market participant has requested system access service to connect its approved Wheatland Wind Project (the Facility) to the transmission system in the Dorothy area (AESO Planning Area 43, Sheerness). The Facility includes

¹ The *Wheatland Wind Project* was originally approved by the Commission on September 7, 2018, in Decision 22643-D01-2018 and Power Plant Approval 22643-D02-2018.

² Available on the AESO website.

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an approved collector substation, designated as the Badlands 981S substation. The market participant expects the Facility to be commercially operational by December 1, 2022.

The market participant's request includes a new Rate STS, *Supply Transmission Service*, contract capacity of 120 MW and a new Rate DTS, *Demand Transmission Service*, contract capacity of 1 MW in the Dorothy area. The market participant's request can be met by amending the NID approval to replace the in-and-out connection with a T-tap connection (the Amended Proposed Transmission Development, as further described in Section 2.2). The scheduled in-service date for the Amended Proposed Transmission Development is June 30, 2022.

This Application describes the need to respond to the market participant's request for system access service, and the AESO's determination of the manner in which to respond to the request. Having followed the AESO Connection Process,³ the AESO has determined that the Amended Proposed Transmission Development provides a reasonable opportunity for the market participant to exchange electric energy and ancillary services. The Amended Proposed Transmission Development is consistent with the AESO's long-term plans for the South Planning Region, which includes the Dorothy area. The AESO submits this Application to the Commission for approval in accordance with the AESO's responsibility to respond to requests for system access service, having determined that the transmission development is required and is in the public interest.^{4,5}

1.4 AESO Directions to the Legal Owner of Transmission Facilities – During the AESO Connection Process, the AESO issued various directions to the legal owner of transmission facilities (TFO), in this case, ATCO Electric Ltd., including directions to assist the AESO in preparing this Amended Application.⁶

³ For information purposes, refer to note iv of Part C of this Application for more information on the AESO Connection Process.

⁴ For information purposes, some of the legislative provisions relating to the AESO's planning duties and duty to provide system access service are referenced in notes i and ii of Part C of this Application.

⁵ Note v of Part C of this Application describes the Application scope in more detail.

⁶ The directions are described in more detail in the following sections of this Application and in Part C, note vi.

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2 Need Overview and Proposed Transmission Development

2.1 Duty to Provide Transmission System Access Service – The AESO, pursuant to its responsibilities under Section 29 of the *Electric Utilities Act* (the Act), must provide system access service on the transmission system in a manner that gives all market participants a reasonable opportunity to exchange electric energy and ancillary services.

The AESO, in consultation with the market participant and the TFO, has determined that the Amended Proposed Transmission Development is the preferred option to provide the market participant with a reasonable opportunity to exchange electric energy and ancillary services. In accordance with Section 34 of the Act, the AESO has determined that the Amended Proposed Transmission Development will result in an expansion or enhancement of the transmission system thereby establishing the need for this Application. The market participant has made the appropriate applications to the AESO to obtain transmission system access service.

Through the AESO Connection Process, the AESO, in consultation with the market participant and the TFO, has determined the Amended Proposed Transmission Development and assessed the impacts that the Amended Proposed Transmission Development and the associated generation would have on the Alberta interconnected electric system. The AESO has issued directions to ATCO to prepare a transmission facility proposal⁷ (Facility Proposal) that corresponds with this Application.

2.2 Amended Proposed Transmission Development – The AESO is applying to amend the NID Approval by removing the entirety of parts a) and c) and amending part b) as follows:

- a) ~~The addition of a new switching station, to be designated as Parker 2072S substation, including three 144 kilovolt (kV) circuit breakers.~~
- b) The addition of one ~~two~~ 144 kV transmission lines to connect the ~~Parker 2072S substation~~ the Badlands 981S substation to the existing

⁷ Also referred to as facility application, or FA, under AUC Rule 007.

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144 kV transmission line 7L85 using ~~an in-and-out~~ a T-tap configuration with a minimum normal rating the same as, or higher than, the normal rating of the existing 144 kV transmission line 7L85.

- ~~c) The addition of one new 144 kV transmission line to connect the Parker 2072S substation to Wheatland Wind Project's Ltd.'s Badlands 981S substation with a minimum rating of 134 MVA.~~

2.3 Cost Estimate – The AESO directed the TFO to prepare a cost estimate for the Amended Proposed Transmission Development, described in Section 2.2. The TFO has estimated the cost of its scope of work to be approximately \$5 million.⁸ In accordance with the ISO tariff, the AESO has determined that all costs associated with the Amended Proposed Transmission Development will be classified as participant-related costs.

2.4 Transmission Development Alternatives – In addition to the Amended Proposed Transmission Development, the AESO, in consultation with the market participant and the TFO, examined one other transmission development alternative to respond to the market participant's request for system access service:

- 1. In-and-out connection to the 144 kV transmission line 7L85** – This alternative involves adding a new switching station, to be designated as the Parker 2072S substation with three 144 kilovolt (kV) circuit breakers; adding two 144 kV circuits to connect the proposed Parker 2072S substation to the existing 144 kV transmission line 7L85 using an in-and-out configuration; and adding a 144 kV circuit to connect the Facility to the proposed Parker 2072S substation.

The Commission approved this alternative in Decision 24040-D01-2019 and NID Approval No. 24040-D02-2019 (Approved Development). However, the AESO subsequently determined, in consultation with the market participant and the TFO, that the Approved Development required increased transmission development, and hence

⁸ The cost is in nominal dollars using a base year of 2021 with escalation considered. Further details of this cost estimate, which has an accuracy level of +20%/-10%, can be found in Appendix B.

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overall increased cost, compared to the Amended Proposed Transmission Development.

2.5 Connection Assessment – Power flow, transient stability and short-circuit studies were conducted to assess the impact that the Amended Proposed Transmission Development and the associated generation would have on the transmission system. Power flow and short-circuit studies were conducted prior to and following the connection of the Amended Proposed Transmission Development and transient stability studies were performed following connection of the Amended Proposed Transmission Development.⁹

The pre-connection assessment identified system performance issues. Under certain Category B conditions, thermal criteria violations were observed. Real-time operational practices and remedial action schemes (RASs) 134, 138, and 139 will be used to mitigate the pre-connection system performance issues.

All of the system performance issues identified in the pre-connection assessment were also identified in the post-connection assessment, and new system performance issues were observed.

A thermal criteria violation was observed under the Category A condition. Should Category A thermal criteria violations materialize, the AESO will use operational procedures or other mitigation measures, to reduce the thermal criteria violations to acceptable levels, which may include the application of Section 302.1 of the ISO rules, *Real Time Transmission Constraint Management* (TCM Rule). If the AESO determines in the future that congestion is reasonably anticipated to arise, the AESO will make an application to the Commission to obtain approval for an exception under Section 15(2) of the *Transmission Regulation* and include the AESO's mitigation plan within the application. The AESO will notify market participants if and when the AESO determines that it is necessary to apply to the Commission for approval of such an exception.

⁹ The connection assessment is included as Appendix A.

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Under certain Category B conditions, all the thermal criteria violations that were observed in the pre-connection assessment were exacerbated in the post-connection assessment and new thermal criteria violations were observed. The following mitigation measures can be used to mitigate the post-connection system performance issues:

- real-time operational practices;
- existing RAS 138
- new RAS 7L171;
- new RAS Anderson 801S; and
- modification of RASs 134 and 139.

Modification of RASs 134 and 139 and use of existing RAS 138 could result in generation curtailment in excess of the Most Severe Single Contingency (MSSC) limit of 466 MW. Pre-contingency generation curtailment under the Category A condition may be required using real-time operational practices to prevent generation curtailment above the MSSC limit during Category B conditions.

2.6 Transmission Dependencies – The Proposed Transmission Development does not require the completion of any other AESO plans to expand or enhance the transmission system prior to connection.

2.7 AESO Participant Involvement Program – The AESO directed the TFO to assist the AESO in conducting the AESO’s participant involvement program (PIP). From June 2021 to December 2021, the TFO and the AESO used various methods to notify stakeholders about the need for development and the AESO’s revised preferred option to respond to the system access service request. This included a notification to market participants that may be affected by the Amended Proposed Transmission Development. The AESO has not received any indication of concerns or objections regarding the need for the Amended Proposed Transmission Development or the AESO’s preferred option

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to respond to the system access service request. In January 2022, the AESO notified stakeholders of its intention to file this Application with the Commission.¹⁰

2.8 Environmental and Land Use Effects – The TFO has advised that the Amended Proposed Transmission Development is not expected to result in significant environmental effects.

2.9 Approval is in the Public Interest – Having regard to the following:

- the transmission planning duties of the AESO as described in Sections 29, 33 and 34 of the Act;
- the market participant’s request for system access service and the AESO’s assessment thereof;
- the TFO’s cost estimate for the Amended Proposed Transmission Development;
- the AESO’s connection assessment;
- the TFOs’ confirmation that no significant environmental effects are expected;
- information obtained from AESO PIP activities; and
- the AESO’s long-term transmission system plans;

it is the conclusion of the AESO that the Amended Proposed Transmission Development provides a reasonable opportunity for the market participant to exchange electric energy and ancillary services. In consideration of these factors, the AESO submits that approval of this Application is in the public interest.

¹⁰ Further information regarding the AESO’s PIP for this Application is included in Appendix C.

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3 Request to Combine this Application with the Facility Proposal for Consideration in a Single Process

3.1 Pursuant to Subsection 35(1) of the Act, the AESO has directed the TFO to prepare a Facility Proposal to meet the need identified. The AESO understands that ATCO's Facility Proposal will be filed shortly.¹¹ The AESO requests, and expects the TFO will request, that this Application be combined with the Facility Proposal for consideration by the Commission in a single process. This request is consistent with Section 15.4 of *Hydro and Electric Energy Act* and Section 7.1 of AUC Rule 007.

3.2 While it is believed that this Application and the Facility Proposal will be materially consistent, the AESO respectfully requests that in its consideration of both, the Commission be mindful of the fact that the documents have been prepared separately and for different purposes. The purpose of this Application is to obtain approval of the need to respond to the market participant's request for system access service and provide a preliminary description of the manner proposed to meet that need. In contrast, the Facility Proposal will contain more detailed engineering and designs for the Amended Proposed Transmission Development and seek approval for the construction and operation of specific facilities.

¹¹ The AESO understands that the TFO intends to file a Facility Proposal relating to this Application to be titled *Wheatland Transmission Project*.

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4 Relief Requested

4.1 The AESO submits that its assessment of the need to meet the market participant's request for system access service is technically complete and that approval is in the public interest.

4.2 For the reasons set out herein, and pursuant to Section 34(2) of the Act and Section 10 of the *Alberta Utilities Commission Act*, the AESO requests that the Commission approve this Application, including amending the NID approval by removing the entirety of parts a) and c) and amending part b) as follows:

- a) ~~The addition of a new switching station, to be designated as Parker 2072S substation, including three 144 kilovolt (kV) circuit breakers.~~
- b) The addition of one ~~two~~ 144 kV transmission lines to connect the ~~Parker 2072S substation~~ the Badlands 981S substation to the existing 144 kV transmission line 7L85 using ~~an in-and-out~~ a T-tap configuration with a minimum normal rating the same as, or higher than, the normal rating of the existing 144 kV transmission line 7L85.
- c) ~~The addition of one new 144 kV transmission line to connect the Parker 2072S substation to Wheatland Wind Project's Ltd.'s Badlands 981S substation with a minimum rating of 134 MVA.~~

All of which is respectfully submitted this 24th day of February, 2022.

Alberta Electric System Operator

"Electronically Submitted by"

Robert Davidson, P.Eng.
V.P., Grid Reliability - Projects and Planning

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PART B – APPLICATION APPENDICES

The following appended documents support the Application (Part A).

APPENDIX A **Connection Assessment** – Appendix A contains the *AESO Engineering Connection Assessment – Wheatland Wind Project Connection* that assesses the transmission system performance prior to and following the connection of the Amended Proposed Transmission Development.

APPENDIX B **TFO Capital Cost Estimate** – Appendix B contains detailed cost estimates corresponding to the Amended Proposed Transmission Development. The estimate was prepared by ATCO, to an accuracy level which exceeds the accuracy required by AUC Rule 007, Section 7.1.2, NID11.

APPENDIX C **AESO PIP** – Appendix C contains a summary of the PIP activities conducted, in accordance with requirements of NID12 and Appendix A2 of AUC Rule 007, regarding the need to respond to the market participant’s request for system access service. Copies of the relevant materials distributed during the PIP are attached for reference.

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PART C – REFERENCES

- i. **AESO Planning Duties and Responsibilities** – Certain aspects of the AESO’s duties and responsibilities with respect to planning the transmission system are described in the Act. For example, Section 17, Subsections (g), (h), (i), and (j), describe the general planning duties of the AESO.¹² Section 33 of the Act states that the AESO “must forecast the needs of Alberta and develop plans for the transmission system to provide efficient, reliable, and non-discriminatory system access service and the timely implementation of required transmission system expansions and enhancements.” Where, as in this case, the market participant (refer to note ii below) is requesting system access service, and the AESO has determined that the request requires or may require the expansion or enhancement of the capability of the transmission system, the AESO must prepare and submit for Commission approval, as per Section 34(1)(c), a needs identification document that describes the need to respond to requests for system access service, including the assessments undertaken by the AESO regarding the manner proposed to address that need. Other aspects of the AESO’s transmission planning duties and responsibilities are set out in Sections 8, 10, 11, and 15 of the *Transmission Regulation*.
- ii. **Duty to Provide Transmission System Access** – Section 29 of the Act states that the AESO “must provide system access service on the transmission system in a manner that gives all market participants [Wheatland Wind Project LP in this case] wishing to exchange electric energy and ancillary services a reasonable opportunity to do so.”
- iii. **AESO Planning Criteria** – In accordance with the Act, the AESO is required to plan a transmission system that satisfies applicable reliability standards. Transmission Planning (TPL) standards are included in the Alberta Reliability Standards, and are generally described on the AESO website.

In addition, the AESO’s *Transmission Planning Criteria – Basis and Assumptions* is included in Appendix A.
- iv. **AESO Connection Process** – For information purposes, the AESO Connection Process, which changes from time to time, is generally described on the AESO website.
- v. **Application for Approval of the Need to Respond to a Request for System Access Service** – This Application is directed solely to the question of the need to respond to a request for system access service, as more fully described in the Act and the *Transmission Regulation*

¹² The legislation and regulations refer to the Independent System Operator or ISO. "AESO" and "Alberta Electric System Operator" are the registered trade names of the Independent System Operator.

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and the AESO's determination of the manner in which to respond to the request. This Application does not seek approval of those aspects of transmission development that are managed and executed separately from the needs identification document approval process. Other aspects of the AESO's responsibilities regarding transmission development are managed under the appropriate processes, including the ISO rules, Alberta reliability standards and the ISO tariff, which are also subject to specific regulatory approvals. While the Application or its supporting appendices may refer to other processes or information from time to time, the inclusion of this information is for context and reference only.

Any reference within the Application to market participants or other parties and/or the facilities they may own and operate or may wish to own and operate, does not constitute an application for approval of such facilities. The responsibility for seeking such regulatory or other approval remains the responsibility of the market participants or other parties.

- vi. **Directions to the TFO** – Pursuant to Subsection 35(1) of the Act, the AESO has directed ATCO, in its capacity as a legal owner of transmission facilities, in whose service territories the need is located, to prepare a Facility Proposal to meet the need identified. The Facility Proposal is also submitted to the Commission for approval. The AESO has also directed ATCO, pursuant to Section 39 of the Act and Section 14 of the *Transmission Regulation*, to assist in the preparation of the AESO's Application. The TFOs have also been directed by the AESO under Section 39 of the Act to prepare a service proposal to address the need for the Amended Proposed Transmission Development.
- vii. **Capital Cost Estimates** – The provision of capital costs estimates in the Application is for the purposes of relative comparison and context only. The requirements applicable to cost estimates that are used for transmission system planning purposes are set out in Section 25 of the *Transmission Regulation*, AUC Rule 007, and Section 504.5 of the ISO rules, *Service Proposals and Cost Estimating*.