

Needs identification document checklist application

Date: November 24, 2021

Applicant reference: P2263 – Hand Hills Wind Project Connection

<p>Identification</p> <p>Company name: Alberta Electric System Operator</p> <p>Name, position and contact information of applicant contact:</p> <p>Michelle Jackson Regulatory Administrator 403-539-2850 Michelle.Jackson@aeso.ca</p>
<p>Project details</p> <p>This application is for:</p> <p>Generation connection <input checked="" type="checkbox"/> Non-distribution facility owner load <input type="checkbox"/></p>
<p>Project written description, including the need, nature and extent of the project and the Alberta Electric System Operator's (AESO) preferred option:</p> <p>BluEarth Renewables Hand Hills Wind Limited Partnership, on behalf of its general partner, BER Hand Hills Wind GP Inc. (BER Hand Hills LP), has requested system access service to connect its approved Hand Hills Wind Project (Facility) to the transmission system in the Delia area (AESO Planning Area 42, Hanna, which is part of the AESO Central Planning Region). The Facility includes BER Hand Hills LP's approved collector substation, designated as the Highland 572S substation. BER Hand Hills LP expects the Facility to be commercially operational by December 2022.</p> <p>BER Hand Hills LP's request includes a new Rate STS, <i>Supply Transmission Service</i>, contract capacity of 145 MW and a new Rate DTS, <i>Demand Transmission Service</i>, contract capacity of 1.5 MW. BER Hand Hills LP's request indicated their intention to submit a proposal to construct and to temporarily operate some transmission facilities, as contemplated in Section 24.31 of the <i>Transmission Regulation</i> (Treg).</p> <p>The Proposed Transmission Development consists of two elements:</p> <ol style="list-style-type: none"> 1. The Proposed BER Hand Hills LP Development, which includes transmission facilities that, as contemplated by Section 24.31 of the TReg will be constructed by BER Hand Hills LP, and, thereafter, jointly operated by BER Hand Hills LP and ATCO Electric Ltd. (ATCO), for a temporary period of time (as per section 24.31(7) of the TReg): <ul style="list-style-type: none"> • Add one 144 kilovolt (kV) circuit, approximately 9.6 kilometers in length, with a minimum capacity of 162 MVA, to connect the Facility to the existing 144 kV transmission line 7L128 using a T-tap configuration; and • Modify, alter, add or remove equipment, including switchgear, and any operational, protection, control and telecommunication devices required to undertake the work as planned and ensure proper integration with the transmission system. 2. The Proposed ATCO Development: <ul style="list-style-type: none"> • Modify, alter, add or remove equipment, including switchgear, and any operational, protection, control and telecommunication devices required to undertake the work as planned and ensure proper integration with the transmission system.¹

¹ ATCO advised the AESO that its scope of work will consist of modifications to the existing 144 kV transmission line 7L128 to facilitate the creation of the T-tap configuration. Also, modifications to the existing Michichi Creek 802S, Coyote Lake 963S and the approved Highland 572S substations including protection, SCADA and telecommunication changes.

Applicable ratings/capability of any proposed major elements:

The 144 kV transmission circuit shall have a minimum capacity of 162 MVA.

Proposed in-service date: September 1, 2022

Cost estimate for the preferred option for the project is attached.

Yes No

The cost estimate for the Proposed BER Hand Hills LP Development is not attached, at the request of BER Hand Hills LP.

Technical considerations**Single line diagram(s) of the proposed development and study area is attached.**

Yes No

The AESO has conducted appropriate studies and considers that the project will not result in adverse impacts to the Alberta Interconnected Electric System.

Yes No

List any new or exacerbated Category B system impacts that occur as a result of the project and provide a description of how they will be addressed (e.g. description of remedial action schemes that will be used):

Power flow, transient stability and short-circuit studies were conducted to assess the impact that the 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 Proposed Transmission Development and transient stability studies were performed following the connection of the Proposed Transmission Development.

The post-connection assessment identified thermal criteria violations under certain Category B conditions. These thermal criteria violations are listed below.

- 144 kV transmission line 7L171 (Michichi Creek 802S - Wintering Hills 804S)
- 144 kV transmission line 7L224 (Hansman Lake 650S Bus 648 - Monitor 774S Bus 1471)
- 144 kV transmission line 7L127 (Monitor 774S - Pemukan 932S)
- 144 kV transmission line 7L85 (Bullpound 803S - Anderson 801S)
- 144 kV transmission line 7L85 (Bullpound 803S - Parker)
- Anderson 801S 240/144 kV Transformer T1
- 144 kV transmission line 7L159 (Ghost Pine - Heatburg 948S)
- 144 kV transmission line 7L16 (Nevis 766S - Heatburg 948S)
- Nevis 766S 901T 240/144 kV Transformer
- 138 kV transmission line 174L (North Holden 395S - Bardo 197S)
- 138 kV transmission line 749L (Edgerton 899S - Killarney T-tap)
- 144 kV transmission line 7L50 (Buffalo Creek 526S - Jarrow Tap 252S)
- 138 kV transmission line 701L (North Holden 395S - Strome 223S)
- 138 kV transmission line 701L/7L701 (Strome 223S - Heisler T-tap)
- 138 kV transmission line 749L/7L749 (Edgerton 899S - Briker Tap)
- 138 kV transmission line 704L (Wainwright 51S - Tucuman 478S)

The following mitigation measures can be used, alone or in combination as appropriate, to mitigate the post-connection system thermal criteria violations:

- existing remedial action schemes (RAS) 134, 138 and 139;
- a planned RAS to mitigate overloads on 7L171;
- a planned RAS to mitigate overloads on Anderson 801S substation transformer 901T;

- a planned RAS to mitigate overloads on 7L224; and
- real-time operational practices.

Briefly describe any alternatives to the AESO's preferred option that the AESO considered and why they were ruled out:

In addition to the Proposed Transmission Development, the AESO examined two other transmission development alternatives, in consultation with BER Hand Hills LP and ATCO:

1. **Radial 240 kV Connection to the Coyote Lake 963S Substation** - This alternative would require adding one 240 kV circuit, approximately 14 kilometers in length, and modifying the Coyote Lake 963S substation, including adding one 240 kV circuit breaker.
2. **Radial 144 kV Connection to Coyote Lake 963S Substation** - This alternative would require adding one 144 kV circuit, approximately 14 kilometers in length, and modifying the Coyote Lake 963S substation, including adding one 144 kV circuit breaker

The alternatives above were ruled out due to increased transmission development, and hence overall increased cost, compared to the Proposed Transmission Development.

Participant involvement requirements

Notification requirements have been met and there are no unresolved objections.

Yes No

Environmental requirements

The AESO does not anticipate significant environmental effects as a result of the project.

Yes No

Other considerations

If you answered no to any of the questions above, please explain:

n/a

The project raises issues not addressed by the preceding questions.

Yes No

If yes, please explain:

n/a