

In the Matter of the Need for the Travers Solar 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
Travers Solar Project Connection
Needs Identification Document

Date: August 28, 2019

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PART A - APPLICATION

1 Introduction

1.1 Application – Pursuant to Section 34(1)(c) of the *Electric Utilities Act* (Act), and in accordance with further provisions set out in legislation,¹ the Alberta Electric System Operator (AESO) applies to the Alberta Utilities Commission (Commission) for approval of the *Travers Solar Project Connection Needs Identification Document* (Application).

1.2 Application Overview – The market participant, Greengate Power Corporation (Greengate), has requested system access service to connect its approved Travers Solar Project² (the Facility) to the transmission system in the Lomond area (AESO Planning Area 49, Stavely). The Facility includes Greengate’s approved collector substation, designated the Little Bow 991S substation. Greengate expects the Facility to be commercially operational in December 2021.

Greengate’s request includes a new Rate STS, Supply *Transmission Service*, contract capacity of 400 MW and a new Rate DTS, *Demand Transmission Service*, contract capacity of 0.5 MW in the Lomond area. Greengate’s request indicated their intention to submit a proposal to construct and to temporarily operate some transmission facilities, as contemplated in Section 24 of the *Transmission Regulation* (TReg). Greengate’s request can be met by adding one 240 kV circuit to connect the Facility to the existing 240 kV transmission line 1005L using a T-tap configuration (the Proposed Transmission Development, as further described in Section 2.2). The scheduled in-service date for the Proposed Transmission Development is December 1, 2020.

This Application describes the need to respond to Greengate’s request for system access service, and the AESO’s determination of the manner in which to respond to the

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 (AUC Rule 007).

² Decision 24502-D01-2019: Greengate Power Corporation - Travers Solar Project, Proceeding 24502, Applications 24502-A001 and 24502-A002, August 26, 2019.

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request. Having followed the AESO Connection Process,³ the AESO has determined that the Proposed Transmission Development provides a reasonable opportunity for Greengate to exchange electric energy and ancillary services. The Proposed Transmission Development is consistent with the AESO's long-term plans for the South Planning Region, which includes the Lomond 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, and having determined that transmission development is required and is in the public interest.^{4,5}

1.3 Market Participant Proposal – On October 20, 2017, Greengate confirmed its intention to submit a proposal to the AESO, pursuant to Section 24 of the TReg (Market Participant Proposal), for the construction and temporary operation of the Greengate Facilities, as defined in Section 2.2 as the Proposed Greengate Development.

As a consequence of the foregoing, pursuant to Section 35(1)(b) of the Act, the AESO requested a proposal from Greengate, including for the purpose of assisting the AESO in preparing this Application.

The AESO considers a completed Market Participant Proposal to have been submitted by Greengate on August 16, 2019. Subsequently, on August 21, 2019, the AESO conditionally approved the Market Participant Proposal pursuant to Section 36 of the Act, and specified the time within which Greengate was to submit, for Commission approval under the *Hydro and Electric Energy Act* (HEEA), a transmission facility proposal⁶ (Facility Proposal) for the Greengate Facilities.

1.4 AESO Directions to the TFO – During the AESO Connection Process, the AESO issued various directions to the legal owner of transmission facilities (TFO), in this case,

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 Also referred to as facility application under AUC Rule 007.

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AltaLink Management Ltd. (AltaLink), in its capacity as general partner of AltaLink L.P., including direction to AltaLink to submit, for Commission approval under the HEEA, a Facility Proposal for the Proposed AltaLink Development, as defined in Section 2.2 as the Proposed AltaLink Development.⁷

⁷ 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 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 Greengate and the TFO, has determined that the Proposed Transmission Development is the preferred option to provide Greengate 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 Proposed Transmission Development will result in an expansion or enhancement of the transmission system thereby establishing the need for this Application. Greengate has made the appropriate applications to the AESO to obtain transmission system access service.

Through the AESO Connection Process, the AESO, in consultation with Greengate and the TFO, has determined the Proposed Transmission Development and has assessed the impacts that the Proposed Transmission Development and the associated generation would have on the Alberta interconnected electric system.

2.2 Proposed Transmission Development – The Proposed Transmission Development involves connecting the Facility to the transmission system, and consists of:⁸

- A. The Proposed Greengate Development, which includes transmission facilities that, as contemplated by Section 24 of the TReg, will be constructed by

⁸ Details and configuration of equipment required for the Proposed Transmission Development, including substation single-line diagrams, are more specifically described in the AESO's Functional Specification included in Greengate's Facility Proposal and AltaLink's Facility Proposal. Also, further details will be determined as detailed engineering progresses and Greengate's operating requirements are finalized. Routing and/or siting of transmission facilities do not form part of this Application and are addressed in Greengate's Facility Proposal and AltaLink's Facility Proposal. Line numbering and substation names provided here are for ease of reference and are subject to change as engineering and design progresses. Greengate facilities that may subsequently be connected to the Proposed Transmission Development are the responsibility of Greengate and are not included in the Application.

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Greengate, and, thereafter, jointly operated by Greengate and AltaLink for a temporary period of time specified in the proposal;⁹ and

B. The Proposed AltaLink Development.

A. The Proposed Greengate Development:

1. Add one 240 kV circuit to connect the Facility to the existing 240 kV transmission line 1005L using a T-tap configuration. The minimum capacity of the 240 kV circuit shall be the same as the existing 1005L; and¹⁰
2. 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.⁹

B. The Proposed AltaLink Development:

3. 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.¹¹

2.3 Proposed Transmission Development Cost Estimate – Greengate has prepared a cost estimate for the Proposed Greengate Development, described in

⁹ Where the AESO approves a proposal per section 24.31(7) of the TReg, Greengate and incumbent TFO must, (a) before applying for any permit, licence or approval under the HEEA to construct or operate the transmission facility, enter into a written agreement under which ownership of the transmission facility will transfer from Greengate to the incumbent TFO on the expiry of the temporary period referred to in subsection (3)(c) of the TReg.

¹⁰ The 240 kV circuit will connect to Greengate's approved Little Bow 991S substation, which is part of the Facility. Greengate has estimated that the 240 kV circuit will have a length of approximately 50 metres. This is subject to change as routing and/or siting is finalized by Greengate.

¹¹ AltaLink advised the AESO that its scope of work will consist of modifications to the existing 240 kV transmission line 1005L to facilitate the creation of the T-tap configuration, and protection, SCADA and telecommunication changes including installation of a radio tower at Little Bow 991S substation.

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Section 2.2. The AESO also directed the TFO to prepare a cost estimate for the Proposed AltaLink Development described in Section 2.2.

Greengate has estimated the cost of the Proposed Greengate Development to be approximately \$0.2 million.¹² The TFO has estimated the cost of the Proposed AltaLink Development to be approximately \$3 million.¹³

In accordance with the ISO tariff, the AESO has determined that all costs associated with the Proposed Transmission Development will be classified as participant-related.

2.4 Transmission Development Alternatives – In addition to the Proposed Transmission Development, the AESO, in consultation with Greengate and the TFO, examined three other transmission development alternatives to respond to Greengate’s request for system access service:

1. **In-and-Out Connection to the 240 kV Transmission Line 1005L** – This alternative involves connecting the Facility to the 240 kV transmission line 1005L using an in-and-out configuration. This alternative would require the addition of a switching station, including three 240 kV circuit breakers and the addition of one 240 kV circuit, approximately 30 metres in length.
2. **In-and-Out Connection to the 240 kV Transmission Line 1036L** – This alternative involves connecting the Facility to the 240 kV transmission line 1036L using an in-and-out configuration. This alternative would require the addition of a switching station, including three 240 kV circuit breakers and the addition of one 240 kV circuit, approximately 30 metres in length.
3. **Radial Connection to 356S Milo substation** – This alternative involves connecting the Facility to the existing 356S Milo substation using a radial configuration. This alternative requires the addition of one 240 kV circuit,

¹² The cost is in nominal dollars using a base year of 2019 with escalation considered. Further details of this cost estimate, which has an accuracy level of +20%/-10%, can be found in Appendix B.

¹³ The cost is in nominal dollars using a base year of 2019 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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approximately 30 kilometres in length, and modification of the Milo 356S substation, including adding one 240 kV circuit breaker.

All three of these alternatives were ruled out due to increased transmission development, and hence overall increased cost, compared to the Proposed Transmission Development.

The Proposed Transmission Development was selected as the preferred transmission alternative and forms the basis for the cost estimates and the connection assessment described herein.

2.5 Connection Assessment – 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 connection of the Proposed Transmission Development.¹⁴

The pre-connection assessment identified system performance issues. Under certain Category B conditions, thermal criteria violations were observed. The following mitigation measures can be used to mitigate the pre-connection system performance issues:

- existing remedial action scheme (RAS) 36;
- planned 172L RAS;¹⁵ and
- real-time operational practices.

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

¹⁴ The connection assessment is included as Appendix A.

¹⁵ Planned 172L RAS was proposed for the approved Stirling Wind Project in the Stirling Wind Project Connection NID, as originally approved by AUC Decision 22546-D01-2019 and NID Approval 22546-D02-2019.

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

- RAS 36;
- a new RAS for 1005L;
- modifications to planned 172L RAS;¹⁶ and
- real-time operational practices.

2.6 AESO Forecast and Transmission System Plans – The AESO’s corporate forecast for the South Planning Region is consistent with generation associated with the Proposed Transmission Development.¹⁷ The AESO’s corporate forecasts are used by the AESO to assess the adequacy of the regional transmission system and as a basis for identifying the need for transmission system expansion or enhancement. The need associated with the Proposed Transmission Development is consistent with the AESO’s long-term plans for this region.

2.7 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.

2.8 AESO Participant Involvement Program – The AESO directed the TFO to assist the AESO in conducting the AESO’s participant involvement program (PIP). The AESO also required Greengate to assist the AESO in conducting the AESO’s PIP as a condition to the AESO’s approval of the Market Participant Proposal.

¹⁶ Ibid

¹⁷ The *AESO 2017 Long-term Outlook* provides forecasting information for the South Planning Region, which includes the Proposed Transmission Development area.

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Between March and July 2019, the TFO, Greengate and the AESO used various methods to notify stakeholders about the need for development and the AESO's preferred option to respond to the system access service request. This included a notification to market participants that may be affected by the Project. There are no outstanding concerns or objections regarding the need for the Proposed Transmission Development or the AESO's preferred option to respond to the system access service request. In August 2019, the AESO notified stakeholders of its intention to file this Application with the Commission.¹⁸

2.9 Information Regarding AUC Rule 007, Section 6.2.2 NID 23(3) – The AESO has been advised that both the TFO Facility Proposal and Greengate Facility Proposal address the requirements of AUC Rule 007, Section 6.2.2, NID23(3).¹⁹ In consideration of this fact, and as the filing of the Application is combined with both the TFO facility proposal and Greengate facility proposal, the AESO has not undertaken a separate assessment of the sort contemplated in AUC Rule 007, Section 6.2.2, NID23(3).

2.10 Confirmation Date – In the event that the proposed facilities are not in service by December 1, 2020, which is the scheduled in-service date of the Project, the AESO will inform the Commission in writing if the need to expand or enhance the transmission system described in this Application continues, and if the technical solution described in this Application continues to be the AESO's preferred technical solution. In addition, in the event that the AESO believes that the in-service date will not be met, and such delay will have a material impact on this Application, the AESO will advise the Commission of the same.

The AESO has been advised that both the TFO's Facility Proposal and Greengate's Facility Proposal address the requirements of AUC Rule 007, Section 6.2.2, NID25(2). In consideration of this fact, and as the filing of this Application is combined with both

¹⁸ Further information regarding the AESO's PIP for this Application is included in Appendix C.

¹⁹ Please refer to the letters included as Appendix D of this Application.

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the TFO's Facility Proposal and Greengate's Facility Proposal, the AESO has not undertaken an implementation schedule of the sort contemplated in AUC Rule 007, Section 6.2.2, NID25(2).²⁰

2.11 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;
- Greengate's request for system access service and the AESO's assessment thereof;
- the AESO's connection assessment;
- the cost estimates for the Proposed AltaLink Development and the Proposed Greengate Development;
- the TFO's and Greengate's confirmation that it has addressed AUC Rule 007, Section 6.2.2, NID23(3);
- information obtained from AESO PIP activities; and
- the AESO's long-term transmission system plans;

it is the conclusion of the AESO that the Proposed Transmission Development provides a reasonable opportunity for Greengate 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.

²⁰ *Ibid*

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

3.1 Pursuant to Subsection 35(1) of the Act, the AESO has directed AltaLink to prepare a Facility Proposal corresponding with this Application. Pursuant to Section 36 of the Act, the AESO has conditionally approved the Market Participant Proposal, and has specified the time within which Greengate must apply for a permit to construct, and a licence to jointly operate with the TFO, the Greengate Facilities.

The AESO understands that the TFO and Greengate Facility Proposals will be filed shortly.²¹ The AESO requests, and expects the TFO and Greengate will request, that this Application be combined with the Facility Proposals for consideration by the Commission in a single process. This request is consistent with Section 15.4 of HEEA and Section 6 of AUC Rule 007.

3.2 While the AESO expects that this Application and the related Facility Proposals will be materially consistent, the AESO respectfully requests that in its consideration of each, 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 Greengate's request for system access service and provide a preliminary description of the manner proposed to meet that need having regard for the AESO's determination that the Proposed Transmission Development is required to provide Greengate with a reasonable opportunity to exchange electric energy and ancillary services. In contrast, the Facility Proposals will contain more detailed engineering and designs for the Proposed Transmission Development and seek approval for the construction and operation of specific facilities.

²¹ The AESO understands that AltaLink intends to file a Facility Proposal relating to this Application to be titled *Greengate Travers Solar Connection*. The AESO understands that Greengate intends to file a Facility Proposal relating to this Application to be titled *Greengate Travers Solar Connection*.

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4 Relief Requested

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

4.2 In the event that the proposed facilities are not in service by December 1, 2020, which is the scheduled in-service date of the Project, the AESO will inform the Commission in writing if the need to expand or enhance the transmission system described in this Application continues, and if the technical solution described in this Application continues to be the AESO’s preferred technical solution.

4.3 For the reasons set out herein, and pursuant to Section 34 of the Act, the AESO requests that the Commission approve this Application, including issuing an approval of the need to respond to Greengate’s request for system access service, and to connect the Facility to the transmission system, by means of the following transmission development:

- A. Add one 240 kV circuit to connect the Facility to the existing 240 kV transmission line 1005L using a T-tap configuration; and
- B. 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.

All of which is respectfully submitted this 28th day of August, 2019.

Alberta Electric System Operator

“Electronically Submitted by”

Robert Davidson, P.Eng.
Director, Transmission Connection Projects

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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 – Travers Solar Project Connection* that assesses the transmission system performance prior to and following the connection of the Proposed Transmission Development. As part of the AESO Connection Process, the AESO defined the study scope, and provided the system models and study assumptions to Greengate who engaged a consultant to conduct the connection assessment studies. The AESO reviewed the results of the connection assessment studies prepared by the consultant, and finds the results of the connection assessment acceptable for the purposes of assessing the impacts of the Proposed Transmission Development on the transmission system.

APPENDIX B Capital Cost Estimates – Appendix B contains detailed cost estimates corresponding to the Proposed Transmission Development. These estimates have been prepared by the TFO at the direction of the AESO and by Greengate. The cost estimates have an accuracy level which exceeds the accuracy required by AUC Rule 007, NID24.

APPENDIX C AESO PIP – Appendix C contains a summary of the PIP activities conducted, in accordance with requirements of NID27 and Appendix A2 of AUC Rule 007, regarding the need to respond to Greengate’s request for system access service. Copies of the relevant materials distributed during the PIP are attached for reference.

APPENDIX D Information Regarding AUC Rule 007, Section 6.2.2, NID23(3) and NID25(2) – Appendix D contains letters provided by the TFO and Greengate confirming that the requirements of AUC Rule 007, NID23(3) and NID25(2) will be addressed within their respective Facility Proposals.

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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.²² 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, Greengate (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 [Greengate Power Corporation 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 at: <https://www.aeso.ca/rules-standards-and-tariff/alberta-reliability-standards/>²³

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 at: <https://www.aeso.ca/grid/connecting-to-the-grid/connection-process/>²⁴

²² 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.

²³ This link is provided for ease of reference and does not form part of this Application.

²⁴ This link is provided for ease of reference and does not form part of this Application.

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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* 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 AltaLink, 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 the TFO, 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 TFO has also been directed by the AESO under Section 39 of the Act to prepare a service proposal to address the need for the 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*.