Alberta Utilities Commission
Decision 25184-D02-2020
Canadian Natural Resources Limited
Primrose East Power Plant and Industrial System Designation Amendment Project
Proceeding 25184
Applications 25184-A001 and 25184-A003

April 6, 2020

Published by the:
Alberta Utilities Commission
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The Commission may, within 30 days of the date of this decision and without notice, correct typographical, spelling and calculation errors and other similar types of errors and post the corrected decision on its website.
1 Decision summary

1. In this decision, the Alberta Utilities Commission considers whether to approve applications from Canadian Natural Resources Limited to construct and operate a 32-megawatt power plant designated as the Primrose East Power Plant, and to amend the existing Primrose Industrial System Designation to include the Primrose East Power Plant (the project). For the reasons outlined in this decision, the Commission finds that approval of the project is in the public interest having regard to the social, economic, and other effects of the project, including its effect on the environment.

2 Introduction and background

2. In 2007, Canadian Natural Resources Limited (CNRL) was granted an industrial system designation (ISD) for its operation at the Primrose industrial complex, pursuant to Order U2007-89. Order U2007-89 lists the major electric facilities that comprise the industrial system.

3. In this proceeding, CNRL requested approval to construct and operate a 32-megawatt (MW) power plant, and that the existing Primrose ISD be amended to include the 32-MW power plant.

4. CNRL stated that the proposed Primrose East Power Plant will consist of a natural gas power plant with one gas turbine generator unit and provision for the future installation of an associated heat recovery steam generator (HRSG) unit. CNRL stated that its Primrose oil production facility is currently subject to provincially legislated oil production curtailment, and as such, does not currently have an increased demand for steam. It plans to convert the power plant to a cogeneration unit in the third quarter of 2023, subject to management approval, when more steam is required by the Primrose facility; and that because the electrical and steam demand growth is not in sync, it makes economic sense to install the power plant in advance of the HRSG.

5. After it issued a notice of applications on December 23, 2019, the Commission received one statement of intent to participate, from AltaLink Management Ltd., on January 13, 2020. AltaLink subsequently withdrew its statement of intent to participate on January 24, 2020.

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2 Exhibit 25184-X0050, IR1 CNRL Response, PDF page 14.
3 Discussion

6. CNRL applied to construct and operate a 32-MW gas turbine generator power plant, equipped with a provision for a HRSG addition, within the existing Primrose industrial system, at Legal Subdivision 4, Section 14, Township 67, Range 3, west of the Fourth Meridian. The project is proposed to be located within the footprint of CNRL’s Primrose East plant site, and on the Cold Lake Air Weapons Range.

7. In response to an information request, CNRL indicated that it is currently evaluating proposals for gas turbine generators with generating capacity in the range of approximately 30 to 35 MW, but has not yet made a selection.\(^3\)

8. CNRL conducted a participant involvement program for the Primrose East Power Plant which involved consultation and notification with landowners, occupants, residents, agencies, industry and other interested parties whom may potentially be impacted by the proposed project. It consulted with parties within an 800-metre radius, and notified parties within a 2,000-metre radius of the proposed project.

9. CNRL stated that there were no questions or concerns expressed by stakeholders, including the Cold Lake Air Weapons Range. CNRL submitted a noise impact assessment that indicated that there are no residential receptors within the noise study area. It explained that based on the Commission’s Rule 012: Noise Control, the noise impact assessment was conducted at the two most affected, unoccupied locations situated on the project’s 1.5-kilometre project boundary. The noise impact assessment predicted that the cumulative sound levels for the proposed power plant comply with the daytime and nighttime permissible sound levels.

10. On February 24, 2020, CNRL filed an approval by the Alberta Energy Regulator amending its existing Environmental Protection and Enhancement Act approval for the Primrose and Wolf Lake facilities to incorporate the addition of the proposed power plant.\(^4\)

11. CNRL submitted an economic assessment of the project and demonstrated the project’s economic benefit when compared to the purchase of power from the Alberta Interconnected Electric System (AIES). The economic assessment showed that at net present value, the project would result in $130 million in savings when compared to the option of purchasing power from the AIES. The assessment also demonstrated that there were savings from the project, compared to the option of purchasing power from the AIES, even when the export revenue and transmission charges were not considered.

12. CNRL hired an independent engineering consultant to investigate the transmission capacity of the Primrose ISD interconnecting circuit and the capability of the surrounding Cold Lake electrical system near the Primrose 859S Substation. The results of the investigation showed that a transmission facility upgrade would be required to serve the incremental load growth if the proposed project was not built. The capital cost of this upgrade was initially estimated to be between $10 and $15 million.

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\(^3\) Exhibit 25184-X0050, IR1 CNRL Response, PDF page 21.
\(^4\) Exhibit 25184-X0061, EPEA Approval.
13. CNRL stated that the Primrose industrial complex is an integrated system of processing plants, pipelines, power lines and production wells specifically designed to produce heavy oil using in-situ thermal techniques. Specifically, heavy oil is extracted using a steam injection process with steam produced on site.

14. CNRL explained that the process is integrated, with resource flows connecting various elements of the process. Raw water is processed into boiler feed water. Boiler feed water and natural gas are used to generate steam. Steam is injected into the field wells for the oil extraction process. Water is separated from the fluids produced in the extraction process, and repurposed for use in the process. Electricity produced on site is used to pump boiler feed water, the produced fluids and heavy oil.

15. CNRL stated that although the Primrose ISD is a net importer of electricity, it has an existing Supply Transmission Service contract with the Alberta Electric System Operator for 85 MW. CNRL has sized the project, including the future HRSG addition, to meet the current and future load and steam requirements of the Primrose industrial complex. The industrial system would continue to exchange electricity with the AIES after the project is built, however, CNRL expects to use all of the power generated by the project within the Primrose industrial complex by 2026.

16. The existing ISD includes a power plant, the Primrose 859S Substation, the Primrose East PES1 Substation, Transmission Line 7L35, Transmission Line 7LP1, and distribution facilities and equipment that are less than 60 kilovolts.

17. The Primrose industrial complex facilities are owned and operated by CNRL, except for the power plant, 50 per cent of the Primrose 859S Substation and Transmission Line 7L35, which are owned by a joint venture. The joint venture is 50 per cent owned by CNRL and 50 per cent owned by Heartland Generation Limited.

18. CNRL stated that all 25-kilovolt distribution facilities are owned and managed by ATCO Electric Ltd., and are contracted under agreements to CNRL for its sole use. All of the transmission and generation facilities are managed exclusively by CNRL on its own behalf or through the joint venture pursuant to the Primrose Power Plant Agreement.

19. CNRL estimated the investment to install the proposed power plant to be $34.5 million, and the total investment for the installation of the proposed power plant, the future installation of the HRSG, and other process elements to be $105 million.  

4 Commission findings

4.1 The statutory scheme

20. The Commission has considered the applications having regard to the applicable legislative and regulatory frameworks. The power plant portion of this application was assessed under sections 11 and 18 of the Hydro and Electric Energy Act, and Section 17 of the Alberta Utilities Commission Act, which requires the Commission to consider whether the project is in the public interest, having regard to its social, economic and environmental effects.

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5 Exhibit 25184-X0050, IR1 CNRL Response, PDF page 17.
The portion of the application pertaining to the amendment to CNRL’s existing ISD was assessed under Section 4 of the *Hydro and Electric Energy Act*.

21. The Commission considers that the public interest will be largely met if an application complies with existing regulatory standards, and the project’s public benefits outweigh its negative impacts. The Commission must take into account the purposes of the *Hydro and Electric Energy Act* and the *Electric Utilities Act* and determine whether an applicant has met the requirements of Rule 007: Applications for Power Plants, Substations, Transmission Lines, Industrial System Designations and Hydro Developments and Rule 012. An applicant must obtain all approvals required by other applicable provincial or federal legislation.

22. Section 4 of the *Hydro and Electric Energy Act* sets out the principles and criteria the Commission must have regard for when considering an ISD application. In particular, as stated in Subsection 4(2):

- The ISD must be consistent with the objective of giving appropriate economic signals such that industrial processes will develop their own internal electricity supply where that is the most economical source of generation.
- The ISD must support the efficient exchange of electric energy that is in excess of the industrial system’s own requirements with the interconnected electric system and improve voltage stability and reduction of losses and congestion of transmission lines.
- The ISD should not facilitate “the development of independent electric systems that attempt to avoid costs associated with the interconnected electric system” and uneconomical bypass of the interconnected electric system.
- Duplication of the interconnected electric system must be avoided where it is more economical to use utility-owned transmission or distribution facilities existing in the service area where the industrial system will be located.

23. Subsection 4(3) sets out specific criteria for determining whether a project should be designated as an industrial system. It states:

(3) The Commission may make a designation under subsection (1) if the Commission is satisfied that all of the following criteria have been met:

(a) the electric system includes a generating unit located on the property of the one or more industrial operations it is intended to serve, there is a high degree of integration of the electric system with one or more industrial operations the electric system forms part of and serves, and there is a high degree of integration of the components of the industrial operations;

(b) the industrial operations process a feedstock, produce a primary product or manufacture a product;

(c) there is a common ownership of all of the components of the industrial operations;
(d) the whole of the output of each component within the industrial operation is used by that operation and is necessary to constitute its final products;

(e) there is a high degree of integration of the management of the components and processes of the industrial operations;

(f) the application to the Commission for a designation under subsection (1) demonstrates significant investment in both the expansion or extension of the industrial operations processes and the development of the electricity supply; (g) where an industrial operation extends beyond contiguous property, the owner of the industrial operation satisfies the Commission that the overall cost of providing the owner’s own distribution or transmission facilities to interconnect the integral parts of the industrial operation is equal to or less than the tariffs applicable for distribution or transmission in the service area where the industrial operation is located.

4.2 The power plant and industrial system designation amendment applications

24. The Commission is satisfied that the technical, siting, emissions, environmental and noise information provided meets the Commission’s application requirements under Rule 007.

25. CNRL completed a participant involvement program and indicated that there are no outstanding public or industry objections or concerns. The Commission consequently finds that the participant involvement program meets the requirements of Rule 007.

26. The noise impact assessment predicted that the cumulative sound levels for the proposed power plant comply with the daytime and nighttime permissible sound levels. As such, the Commission is satisfied that the project complies with Rule 012.

27. The Commission considers that the economic assessment of the amended industrial system continues to support the development of an internal, economical supply of generation to meet the requirements of CNRL’s integrated industrial processes. In addition, the amended ISD would support the principles of efficient and economic exchange with the AIES, while not facilitating an independent system or uneconomic bypass of the AIES. Accordingly, the Commission finds that the amended ISD is consistent with the principles expressed in Subsection 4(2) of the Hydro and Electric Energy Act.

28. The Commission is also satisfied that, with the addition of the proposed power plant, the Primrose ISD will continue to meet all of the ISD criteria set out in Subsection 4(3), with the exception of the common ownership requirement found in Subsection 4(3)(c). More specifically, the Commission is satisfied that the addition of the proposed power plant to the existing industrial system would maintain a high degree of integration of the electric system with the various components of the heavy oil extraction process.

29. Subsections 4(4) and 4(5) set out further criteria for the Commission to consider when a project does not meet those set out in Subsection 4(3). Subsection 4(4) states:

(4) Where the Commission is not satisfied that subsection (3)(c) or (d) has been met, the Commission may make a designation under subsection (1) if the Commission is satisfied that all of the separately owned components and all of the industrial operations are components of an integrated industrial process.
30. While in this instance some of the components of the integrated system are owned by a joint venture that is 50 per cent owned by CNRL and 50 per cent owned by Heartland Generation Limited, and all the 25-kilovolt distribution facilities are owned and managed by ATCO Electric Ltd., the Commission is nonetheless satisfied that all of the separately owned components and all of the industrial operations are components of an integrated industrial process. Consequently, it finds that the project substantially meets the requirements of Subsection 4(4) of the Hydro and Electric Energy Act.

31. Subsection 4(5) gives the Commission the discretion to approve an ISD application if subsections 4(3) and 4(4) have been substantially met and there is a significant and sustained increase in efficiency in a process of the industrial operation or in the production and consumption of electric energy by the industrial operation as a result of the integration of the electric system with the industrial operations the electric system forms part of and serves. As stated above, the Commission finds that subsections 4(3) and 4(4) have been substantially met. Having considered the economic analysis provided by CNRL, it is also satisfied that the addition of generation capacity at this time will result in a significant and sustained increase in efficiency for the industrial operations on site.

32. Having regard for the foregoing, the Commission approves the applications to construct and operate the 32-megawatt Primrose East Power Plant, and to amend the existing Primrose Industrial System Designation to include the Primrose East Power Plant, subject to the following condition:

   a. CNRL must file a letter with the Commission within 30 days of installing the associated heat recovery steam generator unit at the Primrose East facility, indicating that the additional steam capacity has come online.

33. Furthermore, because the final gas turbine generator unit has not been selected, additional information will be required once the equipment selection is finalized. The Commission’s approval is therefore subject to the following second condition:

   b. Once CNRL has made its final selection of equipment for the project, it must file a letter with the Commission that identifies the make and model and confirms the capacity of the generating unit. This letter must also confirm that the project will not increase the land, noise, or environmental impacts beyond those reflected in the materials submitted by CNRL in its application and approved by the Commission. The letter is to be filed no later than 30 days before construction of the project would commence.
5 Decision

34. Pursuant to sections 4, 11 and 19 of the *Hydro and Electric Energy Act*, and sections 2(1)(d) and 117 of the *Electric Utilities Act*, the Commission approves the applications from CNRL to construct and operate a power plant within the Primrose industrial complex, and to amend the existing Primrose Industrial System Designation. The Commission grants the following approval and order:

- Appendix 1 – Power Plant Approval 25184-D03-2020 – April 6, 2020, to construct and operate the Primrose East Power Plant.

- Appendix 2 – Industrial System Designation Order 25184-D04-2020 – April 6, 2020, to amend the Primrose Industrial System Designation.

35. The appendices will be distributed separately.

Dated on April 6, 2020.

**Alberta Utilities Commission**

*(original signed by)*

Anne Michaud  
Vice-Chair
Appendix A – Summary of Commission direction with required deliverables

This section is intended to provide a summary of those directions and conditions that require follow-up with the Commission, for the convenience of readers. It is not intended to summarize all of the conditions imposed on the applicant. In the event of any difference between the directions and conditions in this section and those in the main body of the decision, the wording in the main body of the decision shall prevail.

This direction will be tracked as a direction of Industrial System Designation Order 25184-D04-2020 using the AUC’s eFiling System.

a. CNRL must file a letter with the Commission within 30 days of installing the associated heat recovery steam generator unit at the Primrose East facility, indicating that the additional steam capacity has come online.

This directions and conditions will be tracked as a direction of Power Plant Approval 25184-D03-2020 using the AUC’s eFiling System.

b. Once CNRL has made its final selection of equipment for the project, it must file a letter with the Commission that identifies the make and model and confirms the capacity of the generating unit. This letter must also confirm that the project will not increase the land, noise, or environmental impacts beyond those reflected in the materials submitted by CNRL in its application and approved by the Commission. The letter is to be filed no later than 30 days before construction of the project would commence.