AUC
Alberta Utilities Commission

# Shell Canada Limited

## Errata to Decision 2014-068

## Shell Peace River In-situ Expansion Carmon Creek Project Industrial System Designation, Power Plant, 240-kV Substation and 34.5-kV Distribution System

## April 15, 2014

**The Alberta Utilities Commission**
Decision 2014-068 (Errata): Shell Canada Limited
Shell Peace River In-situ Expansion Carmon Creek Project
Industrial System Designation, Power Plant, 240-kV Substation
and 34.5-kV Distribution System
Applications No. 1609847, No. 1610047 and No. 1610048
Proceeding No. 2787

April 15, 2014

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**The Alberta Utilities Commission**

**Calgary, Alberta**

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|---|---|
| **Shell Canada Limited** | **Decision 2014-068 (Errata)** |
| **Shell Peace River In-site Expansion Carmon Creek Project** | **Applications No. 1609847,** |
| **Industrial System Designation, Power Plant,** | **No. 1610047 and No. 1610048** |
| **240-kV Substation and 34.5-kV Distribution System** | **Proceeding No. 2787** |

## 1 Introduction

1. On March 21, 2014, the Alberta Utilities Commission (AUC or the Commission) issued Decision 2014-068 to Shell Canada Limited.

2. Paragraph 41 of Decision 2014-068 stated:

> 41. The Commission is satisfied that the criteria described in subsection 4(3)(f) are met because Shell submitted that the total capital investment would be approximately $7 billion, of which approximately $1 billion would relate to the development of cogeneration facilities. Shell noted that it considered the capital cost estimation at this stage to be preliminary and commercially sensitive.

3. The value of $7 billion dollars was incorrectly stated in paragraph 41. The reference to "seven" billion should have been "several" billion.

4. Paragraph 41 now reads:

> 41. The Commission is satisfied that the criteria described in subsection 4(3)(f) are met because Shell submitted that the total capital investment would be several billion dollars, of which approximately $1 billion would relate to the development of cogeneration facilities. Shell noted that it considered the capital cost estimation at this stage to be preliminary and commercially sensitive.

5. Section 48 of AUC Rule 001: *Rules of Practice* indicates that "[t]he Commission may correct typographical errors, errors of calculation and similar errors made in any of its orders, decisions or directions." Accordingly, this errata decision is being issued to correct the aforementioned error.

6. Decision 2014-068 has been amended and is attached to this Decision 2014-068 (Errata).

Dated on April 15, 2014.

**The Alberta Utilities Commission**

*(original signed by)*

Henry van Egteren
Commission Member

AUC
Alberta Utilities Commission

# Shell Canada Limited

## Shell Peace River In-situ Expansion Carmon Creek Project Industrial System Designation, Power Plant, 240-kV Substation and 34.5-kV Distribution System

**March 21, 2014**

**The Alberta Utilities Commission**
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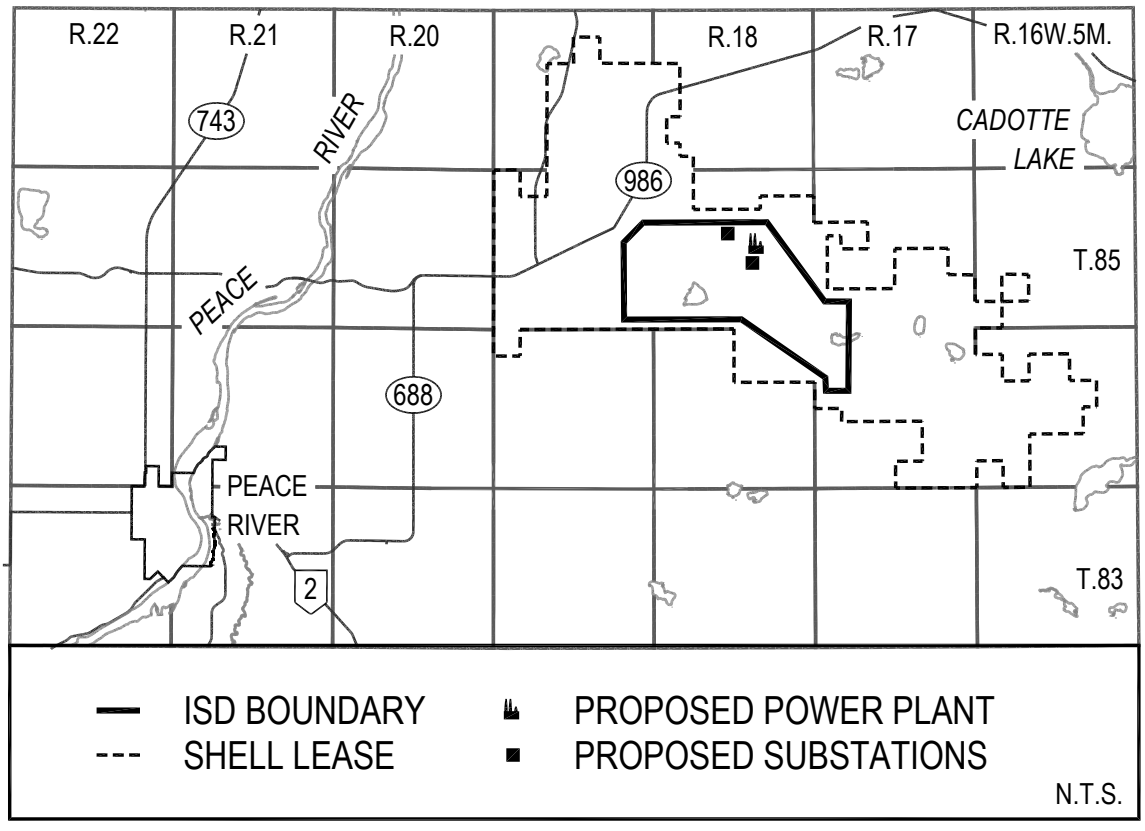
| **240-kV Substation and 34.5-kV Distribution System** | **Proceeding ID No. 2787** |

## 1 Introduction

1. In this decision, the Alberta Utilities Commission (AUC or the Commission) must decide whether to approve three related applications by Shell Canada Limited (Shell) for: an industrial system designation (ISD) (Application No. 1609847), a 690-megawatt (MW) cogeneration power plant (Application No. 1610047) and three related substations (Application No. 1610048). The Commission combined all three applications under Proceeding ID No. 2787 to consider them jointly (the proposed project).

2. The ISD, the cogeneration power plant and the substations would all be located in Northern Sunrise County, approximately 40 kilometres northeast from the town of Peace River. The industrial system designation boundary, lease area and plant locations are shown in Figure 1 below.

**Figure 1 - Shell's industrial system designation for the Carmon Creek project phases 1 and 2**



3. The Commission issued three rounds of information requests to Shell on January 14, 2014, January 16, 2014, and February 6, 2014. Shell responded to the Commission's information requests on January 28, 2014, January 21, 2014, and February 7, 2014, respectively.

4. The Commission issued a notice of applications on January 24, 2014, to all landowners, residents, occupants, agencies, companies and First Nation groups within 2,000 metres of the proposed power plant site boundary and within 800 metres of the site boundary of all the proposed electrical facilities in the ISD including the distribution lines to well pads. The deadline for filing a response to the notice was February 14, 2014. The notice was also published in a number of local newspapers and on the AUC website. The Commission received no submissions in response to the notice.

## 2 Background

### 2.1 The Carmon Creek project

5. Shell's Carmon Creek project is an 80,000 barrels per day (bbl/d) (12,600 $m^3$/d) in-situ oilsands commercial scheme development located in townships 84 to 85, ranges 17 to 19, west of the Fifth Meridian. The Carmon Creek project was approved[1] by the Energy Resources Conservation Board (ERCB)[2] on April 26, 2013.

6. The Carmon Creek project would utilize a thermal technology – vertical steam drive thermal recovery process along with cyclic steam stimulation. The project would include the development of the central processing facilities (CPF), the initial seven well pads for drilling, the thermal injection wells, the production wells and the disposal wells. Shell proposed to install the cogeneration facilities at the Shell Carmon Creek project site to supply the steam and electrical energy needs for the Shell in-situ oilsands commercial scheme development.

### 2.2 The ISD application

7. The electric system components to be designated as an industrial system would be composed of a cogeneration power plant consisting of three 230-MW gas turbine generators, the 240-kV Brock 232S substation, the 34.5-kV CPF substation, a 25/34.5-kilovolt (kV) temporary drilling substation and the associated 34.5-kV distribution system.

8. Shell initially asked the Commission for an approval to pre-construct and operate a 34.5-kV distribution system to provide service to the initial seven well pads for drilling pending the Commission's decision on its ISD application. To supply these initial drilling well pads, Shell proposed to build a 25/34.5-kV temporary drilling substation, with installation of a 7.5/10-megavolt-ampere (MVA) 25/34.5-kV step-up transformer at one of these drilling well sites. This step-up transformer would be energized by an existing 25-kV distribution line from the existing Shell Peace River Complex plant site, which is supplied by ATCO Electric Ltd.'s Carmon 830S substation. Shell submitted a letter from ATCO Electric Ltd., dated July 31, 2013, in support of Shell's plan for the proposed pre-built portion of the 34.5-kV distribution system.

[1] Exhibit 0002.00-SCLTD-2787, ERCB Scheme Approval.
[2] Now known as the Alberta Energy Regulator (AER).

9. Shell submitted that once the cogeneration units are operable, the proposed pre-built 34.5-kV distribution system would be connected to the 34.5-kV CPF substation and the temporary 25/34.5-kV transformer would be removed.

10. Shell submitted a noise impact assessment for the proposed power plant, substations and 34.5-kV distribution system included in the industrial system designation. The noise impact assessment concluded that upon the completion of the project, the power plant, substations and other electrical facilities would meet the noise requirements as prescribed by AUC Rule 012: *Noise Control* (AUC Rule 012).

11. Shell indicated that the Carmon Creek project is not located within the boundaries of the Lower Athabasca Regional Plan (LARP) and there is currently no regional land use plan in the area where the proposed project is located.

12. On July 15, 2013, Shell received a letter[3] from Alberta Culture stating that *Historical Resources Act* clearance is granted for the "Initial Development Area" footprint of the Carmon Creek project as illustrated on the figure (see green footprint) attached to the letter from Alberta Culture.

13. Shell conducted a participant involvement program for the Carmon Creek project phases 1 and 2, including stakeholder notifications and consultation regarding the overall in-situ oilsands commercial scheme development, and the proposed power plant, substations and other electrical facilities included in the industrial system designation. Additionally, Shell stated that there are no residents, occupants or private landowners within 800 metres of the proposed substations.

### 2.3 Application No. 1610047 – power plant application

14. Shell submitted that the proposed cogeneration power plant would consist of three 230-MW natural gas turbine generators each equipped with a heat-recovery steam generator, with a total generating capability of 690 MW. In addition, the power plant would include two standby diesel-fuelled generators, each with a preliminary generating capability of five MW.

15. The proposed power plant would be located in the northeast quarter of Section 15 and the southeast quarter of Section 22, Township 85, Range 18, west of the Fifth Meridian.

16. Shell indicated that the power plant would be commissioned in three stages; the first cogeneration unit was anticipated to be in-service by January 2016, the second cogeneration unit to be in-service by March 2016, and the third cogeneration unit to be in-service by May 2016.

17. Shell explained that the cogeneration units would provide steam and electricity to the CPF and associated well pads. It stated that during normal operation, excess electricity would be generated and sold to the Alberta Interconnected Electric System. Conversely, if the cogeneration is not available, Shell would utilize on-site standby generators and/or purchase electricity for the Carmon Creek project phases 1 and 2 from the Alberta Interconnected Electric System. The 240-kV Brock 232S substation would provide a connection to the Alberta Interconnected Electric System via two 240-kV transmission lines to be constructed and owned by ATCO Electric Ltd.

[3] Exhibit 0017.00.SCLTD-2787, Historical Resources Act Clearance.

## 2.4 Application No. 1610048 – substation application

18. Shell proposes to construct and operate the following substations to be included in the ISD:

- one 240-kV substation to be designated as Brock 232S substation
    - three 16.5/240-kV, 138/184/230-MVA generator step-up transformers
    - three 240/34.5-kV 75/100/125-MVA step-down transformers
    - nine 240-kV circuit breakers
- one 34.5-kV substation to be designated as CPF substation
    - four 34.5/6.9-kV, 20-MVA distribution transformers (supplying boiler feed water pumps)
    - three 34.5/4.16-kV, 20-MVA distribution transformers (supplying main 4.16-kV system)
    - eight 34.5/4.16-kV, 20-MVA distribution transformers (supplying a 4.16-kV system across the facility)
    - twenty-seven 34.5-kV circuit breakers
- one temporary 25/34.5-kV substation to be designated as temporary drilling substation
    - one temporary 25/34.5-kV, 7.5/10-MVA step-up transformer
    - one 25-kV circuit breaker
    - fifteen 34.5-kV circuit breakers

## 3 Findings

19. The Commission considered the ISD application in accordance with the principles and criteria set out in Section 4 of the *Hydro and Electric Energy Act*. These principles and criteria, as well as the Commission's findings regarding the ISD, are addressed below.

### Principle 4(2)(a) – most economic source of generation

20. This principle requires applicants to demonstrate that the internal supply of electricity through on-site generation is the most economical source of power for the industrial complex.

21. Shell stated that the ISD would support the development of an economical supply of all the steam necessary for the Carmon Creek project and an economical supply of electricity for both Shell and Albertans. Shell explained that the large cogeneration units would produce steam more economically than stand-alone steam generators and would also have high efficiency gas turbines that could produce electricity more cost effectively than other natural gas-fired generation technologies.

22. Shell performed a high-level economic comparison of the cost of providing electricity and steam based on three scenarios:

- Steam only case – capital cost of stand-alone boilers and utilization of produced treated gas and purchased natural gas.
- Base case – cost of steam only case for steam production and cost of electricity to be purchased from the Alberta Interconnected Electric System.
- Cogeneration case – cost of capital, operating and tariff for steam and electricity from cogeneration, including revenue offsets from electricity to be sold to the Alberta Interconnected Electric System.

23. The Commission finds that Shell's economic comparison demonstrates that installing cogeneration would have a net present value benefit of approximately $1 billion over the life of Carmon Creek project phases 1 and 2. In the Commission's view, Shell's analysis was based on reasonable inputs and it is satisfied that the proposed industrial system, with the cogeneration power plant, satisfies the principles of the most economical source of generation.

**Principles 4(2)(b), (c) and (d) – efficient exchange, avoidance, uneconomical bypass and duplication**

24. These principles require applicants to demonstrate that the industrial system designation supports the development of an economical supply of generation to meet the requirements of integrated industrial processes, the efficient exchange with the interconnected electric system of electric energy that is in excess of the industrial system's own requirements, and the making of decisions respecting the location of generation and consumption facilities so that the efficiency of the interconnected electric system is improved, including improved voltage stability and reduction of losses and congestion on transmission lines.

25. Principles 4(2)(c) and (d) require applicants to demonstrate that the industrial system designation does 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.

26. Shell submitted that the ISD would support the efficient exchange of electricity with the Alberta Interconnected Electric System that is in excess of Shell's own requirements because the contemplated 240-kV transmission lines (not included in Shell's applications in Proceeding ID No. 2787) from the Brock 232S substation to the existing Wesley Creek 834S substation would provide an efficient exchange of electricity between Shell's ISD and the Alberta Interconnected Electric System.

27. Shell submitted that there is currently more load than generation in the northwest portion of Alberta, which results in high transmission line losses. With the Carmon Creek project, Shell suggested that the AESO's transmission development in support of load growth in the northwest area may no longer be required. Shell stated that the existing 144-kV transmission line from Wesley Creek 834S substation to Carmon 830S substation is not capable of serving existing load in the area and, therefore, could not serve the additional 70 MW to 150 MW of load for the Carmon Creek project. Shell concluded that a new 240-kV transmission development or 144-kV

transmission expansion would be required if the Carmon Creek project phases 1 and 2 were developed without on-site cogeneration.

28. Shell submitted a well pad distribution system study that concluded a 34.5-kV distribution system would cost less than a 25-kV distribution system because the 34.5-kV distribution system would require fewer distribution lines and less right-of-way, and result in lower line losses. Shell stated that ATCO Electric Ltd. is not prepared to provide distribution service at the 34.5-kV voltage level. Therefore, Shell stated that it would not duplicate or replace ATCO Electric Ltd.'s local distribution system.

29. The Commission finds that, without the cogeneration power plant, the Carmon Creek project would add approximately 70 MW to 150 MW of electric load to the Alberta Interconnected Electric System, which would have to be served by generation sources outside the Carmon Creek site. The Commission also finds that interconnecting the Carmon Creek project to the Alberta Interconnected Electric System would result in increased system losses. Accordingly, the Commission is satisfied that Shell's proposed ISD would improve the efficiency of the Alberta Interconnected Electric System by removing base load from the system, including improved voltage stability, and reduction of losses and congestion on transmission lines.

30. The Commission is also satisfied that approval of the ISD application would not facilitate the development of independent electric systems that attempt to avoid costs associated with the Alberta Interconnected Electric System, facilitate uneconomical bypass of the Alberta Interconnected Electric System and result in duplication of the Alberta Interconnected Electric System.

31. Therefore, the Commission finds that the proposed ISD meets the principles in subsections 4(2)(b), (c) and (d) of the *Hydro and Electric Energy Act*.

## Criteria 4(3)(a), (b) and (d) – generation units, primary product and output

32. Subsection 4(3)(a) requires applicants to demonstrate that the electric system includes a generating unit located on the property of the one or more industrial operations it is intended to serve, that 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 a high degree of integration of the components of the industrial operations. Subsection 4(3)(b) states that the industrial operations process a feedstock, produce a primary product or manufacture a product. Finally, subsection 4(3)(d) states that 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.

33. The Commission is satisfied that the criteria described in subsection 4(3)(a) are met because Shell's proposed ISD incudes three cogeneration units located on the Carmon Creek project site that would jointly provide steam and electricity to all well pads and the CPF. Furthermore, the Commission is satisfied that there is a considerable integration between the electric system and the industrial operation processes because each of the facilities for cogeneration, water treatment, gas treatment and supply, and bitumen treatment would be fully integrated and supplied from the proposed electric system to produce and process fluids into bitumen.

34. The Commission is satisfied that the criteria described in subsections 4(3)(b) and (d) are met because the fluids produced at each well pad would be pipelined to the CPF where they would be processed into bitumen, treated produced gas and treated produced water. Shell explained that the treated produced gas and water would be used within the CPF. Shell also indicated that each of the components that comprise the industrial system would be required to produce and process reservoir fluids into usable products. As a result, the output of the cogeneration units would provide steam to each well pad and provide electricity to the CPF processes and well pad pumping units, and associated electrical equipment.

35. Based on the above-mentioned information, the Commission finds that criteria 4(3)(a), (b) and (d) are met.

**Criteria 4(3)(c), (e), (f) and (g) – ownership, management, investment and operation beyond contiguous property**

36. Subsection 4(3)(c) states that there is a common ownership of all the components of the industrial operations.

37. Subsection 4(3)(e) states that there is a high degree of integration for management of the components and processes of the industrial operations.

38. Subsection 4(3)(f) states that an application to the Commission for an ISD demonstrates significant investment in both the expansion and extension of the industrial operations processes and development of the electricity supply.

39. Subsection 4(3)(g) applies where an industrial operation extends beyond contiguous property.

40. The Commission is satisfied that the criteria described in subsections 4(3)(c) and (e) are met because Shell stated that it would solely own and operate the proposed industrial system. All of the components and processes of the proposed industrial operations would be fully integrated and managed together by Shell.

41. The Commission is satisfied that the criteria described in subsection 4(3)(f) are met because Shell submitted that the total capital investment would be several billion dollars, of which approximately $1 billion would relate to the development of cogeneration facilities. Shell noted that it considered the capital cost estimation at this stage to be preliminary and commercially sensitive.

42. The Commission finds that the criteria described in the subsection 4(3)(g) would not apply to Shell's applications because Shell indicated that the Carmon Creek project would be wholly located within Shell's oilsands lease boundaries and the industrial operation would not extend beyond Shell's oilsands lease boundaries.

43. Based on the above-mentioned information, the Commission finds that criteria 4(3)(c), (e), (f) and (g) are met.

44. Having considered all of the principles and criteria set out in Section 4 of the *Hydro and Electric Energy Act*, the Commission finds that Shell's ISD application substantially meets all

the principles and criteria for an industrial system designation, and also demonstrates significant and sustained increased efficiency.

45. The Commission is satisfied with Shell's participant involvement program and notes that there are no outstanding public or industry objections or concerns. The Commission issued a notice of applications and no objections to the applications were received.

46. The Commission is satisfied that the submitted noise impact assessment demonstrates compliance with the requirements of AUC Rule 012.

47. The Commission notes that Shell has submitted an amended approval of the *Environmental Protection and Enhancement Act* issued by Alberta Environment and Sustainable Resource Development on June 14, 2013 for Shell's cogeneration power plant and substations. The Commission is satisfied that the environmental aspects of the proposed project described in the applications are current, and that Alberta Environment and Sustainable Resource Development has no outstanding concerns.

48. The Commission has reviewed the applications for the power plant, substation and ISD filed by Shell. The Commission finds that the technical, siting and environmental requirements of the *Hydro and Electric Energy Act* and AUC Rule 007: *Applications for Power Plants, Substations, Transmission Lines, Industrial System Designations and Hydro Developments* (AUC Rule 007), have been met.

49. Based on the foregoing, in accordance with Section 17 of the *Alberta Utilities Commission Act*, the Commission finds that construction and operation of the proposed power plant and transmission facilities are in the public interest having regard to the social and economic effects of the facilities, and the effects on the environment.

50. Because the Commission has decided to approve Shell's ISD application, it is unnecessary for the Commission to consider Shell's request for an interim approval regarding the pre-construction of a portion of the 34.5-kV distribution system within the ISD boundary. The Commission confirms that Shell can proceed with the construction and temporary operation of the proposed 34.5-kV distribution system for the initial seven well pads as described in Application No. 1609847 and ATCO Electric Ltd.'s letter dated July 31, 2013, pursuant to the industrial system designation granted by the Commission in this decision.

## 4 Decision

51. Pursuant to Section 4 of the *Hydro and Electric Energy Act* and sections 2(1)(d) and 117 of the *Electric Utilities Act*, the Commission approves the ISD application and grants to Shell the approval set out in Appendix 1 – Industrial System Designation Order No. U2014-97 – March 21, 2014.

52. Pursuant to Section 11 of the *Hydro and Electric Energy Act*, the Commission approves the power plant application and grants to Shell the approval set out in Appendix 2 – Power Plant Approval No. U2014-98 – March 21, 2014, to construct and operate a 690-MW cogeneration power plant.

53. Pursuant to sections 14, 15, and 19 of the *Hydro and Electric Energy Act*, the Commission approves the substation application and grants to Shell the approval set out in Appendix 3 – Substation Permit and Licence No. U2014-99 – March 21, 2014, to construct and operate Brock 232S substation.

54. The appendices will be distributed separately.

Dated on March 21, 2014.

**The Alberta Utilities Commission**

*(original signed by)*

Henry van Egteren
Commission Member