AUC
Alberta Utilities Commission

Concord Coaldale GP2 Ltd.

Coaldale Solar Project
Battery Energy Storage System Addition

November 4, 2022

Alberta Utilities Commission
Decision 27216-D01-2022
Concord Coaldale GP2 Ltd.
Coaldale Solar Project Battery Energy Storage System Addition
Proceeding 27216
Application 27216-A001

November 4, 2022

Published by the:
Alberta Utilities Commission
Eau Claire Tower
1400, 600 Third Avenue S.W.
Calgary, Alberta T2P 0G5

Telephone: 310-4AUC (310-4282) in Alberta
1-833-511-4AUC (1-833-511-4282) outside Alberta
Email: info@auc.ab.ca
Website: www.auc.ab.ca

The Commission may, no later than 60 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.

Contents

1 Decision summary

1. In this decision, the Alberta Utilities Commission approves an application from Concord Coaldale GP2 Ltd. (Concord) for the addition of a battery energy storage system (BESS) at the site of the already approved Coaldale Solar Project near Coaldale, Alberta.

2 Application

2. Concord, pursuant to Approval 27080-D02-2022,[1] has approval to construct and operate a power plant designated as the Coaldale Solar Project, located near the town of Coaldale in Lethbridge County.

3. Concord filed an application with the AUC to seek an approval to alter and operate the power plant by adding a 21-megawatt (MW), 42-megawatt-hour (MWh) BESS within the existing fenceline of the power plant (the project). The application was registered on March 4, 2022, as Application 27216-A001.

4. Concord selected 126, 372.7-kilowatt-hour CATL EnerOne LFP[2] batteries and 42 Dynapower converters for the BESS.[3] The BESS would allow for two hours of storage and charge primarily from on-site solar production and discharge to the 25-kilovolt distribution system, while also having the ability to charge from the distribution system.

5. Concord's application included:

- Confirmation from Alberta Environment and Parks[4] that it had reviewed the proposed BESS addition and had no comments or suggested changes to the current renewable energy referral report.[5]

- A noise impact assessment (NIA), completed by RWDI Air Inc., which predicted that the project will comply with Rule 012: *Noise Control.*[6]

---

1 Power Plant Approval 27080-D02-2022, Proceeding 27080, Application 27080-A001, January 14, 2022.
2 LFP batteries, or lithium iron phosphate batteries are a type of lithium-ion battery which use iron phosphate as the cathode.
3 Exhibit 27216-X0024, Coaldale BESS - IR Round 1_FINAL, PDF page 4.
4 On October 24, 2022, the Ministry of Environment and Parks was renamed the Ministry of Environment and Protected Areas. Any references to AEP in Rule 033: *Post-approval monitoring requirements for wind and solar power plants* and elsewhere that relate to forward-looking obligations or commitments between the applicant and AEP should be interpreted as meaning Alberta Environment and Protected Areas.
5 Exhibit 27216-X0012, Appendix K - AEP Email.
6 Exhibit 27216-X0013, Appendix L - 20220303 RWDI NOI BowMountCoaldaleSolarNIA.

- A summary of its participant involvement program, which included notification of stakeholders within two kilometres of the project boundary.[7]

- A letter of non-objection from FortisAlberta Inc., the distribution facility owner in the area.[8]

6. Concord submitted that construction for the Coaldale Solar Project began in April 2021, and achieved commercial operations as of September 30, 2022.[9] Concord anticipated construction of the BESS to be complete by October 31, 2022, but later revised the date to September 30, 2023.[10]

7. The Commission issued a notice of application to stakeholders in the project area. In response, the Commission received correspondence from counsel representing Nivin Farms Ltd., John and Carolyn Leusink, and Dave and Grace Matthies, nearby landowners or occupants who expressed concern about the project.[11] The Commission granted standing to all of the above parties.[12,13] Upon granting standing, the Commission set out a process to consider the application, which included an oral hearing. The interveners subsequently withdrew their opposition to the application,[14] and the Commission cancelled the oral hearing for the project.

3 Discussion and findings

8. After consideration of the record of the proceeding, and 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.

9. This decision first considers the safety issues associated with the BESS addition, followed by a discussion of the other issues associated with the application.

3.1 Safety

10. Concord explained that lithium-ion batteries, the type of technology proposed, are the dominant storage technology today and are generally considered safe. However, Concord acknowledged that risks do exist, which is why it took measures to manage and mitigate risks to the facility and the surrounding area.[15]

11. In selecting the proposed BESS, Concord considered a number of factors. The BESS was tested for high temperature conditions and complies with international standards for the safe function of lithium-ion type batteries and BESS, even under conditions such as thermal

[7] Exhibit 27216-X0024, Coaldale BESS - IR Round 1_FINAL, PDF page 5.
[8] Exhibit 27216-X0003, Appendix B - Letter of Non-Objection to AUC - Coaldale Battery Storage Add.
[9] Proceeding 27080, response to Direction 27080-D02-2022-0004.
[10] Exhibit 27216-X0047, Coaldale BESS - IR Round 4_FINAL, PDF page 6.
[11] Exhibit 27216-X0022, Letter to Alberta Utilities Commission.
[12] Exhibit 27216-X0029, AUC letter - Ruling on standing.
[13] Exhibit 27216-X0035, AUC letter - Ruling on standing motion.
[14] Exhibit 27216-X0044, Letter re withdrawal of opposition.
[15] Exhibit 27216-X0024, Coaldale BESS - IR Round 1_FINAL, PDF page 3.

runaway.[16] To minimize the likelihood of a thermal runaway event, each individual BESS unit will come equipped with a fire protection system consisting of smoke and heat detectors, and an aerosol-based suppressant to mitigate thermal runaway at the rack level. In the event of a fire, deflagration panels in the BESS will direct possible flames or gases upward instead of towards other batteries. To further mitigate thermal runaway, the BESS units use a liquid cooling system known to be more effective than an air-cooled system. The BESS units will feature a cabinet enclosure which doesn't allow personnel to enter, thereby reducing the risk of exposure to potential thermal runaway events during commissioning or maintenance. The BESS will also protect against abnormal operating conditions by monitoring temperatures at the cell, module and enclosure level.[17]

12. Concord stated that the project site will have remote monitoring of all BESS enclosures, including loads, charge/discharge cycles and emergency conditions. The project will use a supervisory control and data acquisition system providing real-time monitoring of all parameters, as well as a BESS control system that monitors the BESS in real time.[18] The project site will also feature security cameras throughout, to monitor activity on site. Concord explained that the site will be monitored continuously from an off-site operations monitoring centre staffed 24/7/365 by operations personnel with control capability. In the event of an alarm representing an emergency condition (i.e., over-temperature or fire detection), the operator will be notified and will, if necessary, alert emergency services according to site communication protocols and the project's emergency response plan.

13. Finally, Concord maintained that it will hire a qualified engineering, procurement and construction contractor who will be responsible for completing testing during commissioning to ensure that adequate safety measures are in place in the event of a fire.[19]

14. Concord did not initially conduct fire toxicity plume modelling for the project, but provided an air quality assessment report upon the Commission's request.[20] Concord contracted RWDI to conduct the assessment. The assessment was completed based on guidance from Environment and Climate Change Canada (*Technical Guidelines for the Environmental Emergency Regulations*, 2019), the United States Environmental Protection Agency (*Risk Management Program Guidance for Offsite Consequence Analysis*, 2009), and the Major Industrial Accidents Reduction council (*Risk Management Guide for Major Industrial Accidents Intended for Municipalities and Industry*, 2007).

15. RWDI completed its modelling using the PHAST accidental release, discharge and consequence model. RWDI selected the PHAST model as it can calculate exposure distances for a variety of materials, release scenarios, averaging periods, and meteorological conditions. RWDI noted the possibility that toxic hydrogen fluoride (HF) will be generated in the event of a fire at the proposed BESS. HF emissions are a potential hazard associated with thermal runaway of lithium-ion batteries.

---

16 The BESS will adhere to or consider standards such as UN38.3 (safe transport of lithium batteries), UL1973 (exposure to thermal runaway), UL9540A (test method for thermal runaway) and NFPA 855 (standard for installation of BESS).

17 Exhibit 27216-X0024, Coaldale BESS - IR Round 1_FINAL, PDF page 3.

18 Exhibit 27216-X0024, Coaldale BESS - IR Round 1_FINAL, PDF page 4.

19 Exhibit 27216-X0024, Coaldale BESS - IR Round 1_FINAL, PDF page 3.

20 Exhibit 27216-X0031, Attachment 1 - 20220630 RWDI AirQuality CoaldaleBESSFire.

16. RWDI used the United States Environmental Protection Agency's Acute Exposure Guideline Levels (AEGL) to measure the threshold hazard criteria associated with the toxicity of HF, as recommended by Environment and Climate Change Canada.[21]

17. The AEGL system characterizes three concentration levels, or tiers, with associated exposure times, ranging from transient easily reversible impacts (AEGL level 1, or AEGL-1) to life-threatening health effect (AEGL level 3, or AEGL-3). RWDI selected AEGL level 2, or AEGL-2[22] as the appropriate exposure criteria based on recommendations by Environment and Climate Change Canada. AEGL-2 is described as "the airborne concentration above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape."[23]

18. RWDI determined that downwind HF concentrations at or above AEGL-2 will extend up to 144 metres from a BESS unit involved in a fire. Because the nearest resident is located 330 metres from a BESS unit, they would be expected to experience HF concentrations less than AEGL-2 in the event of a fire.[24]

19. In response to an information request, Concord also provided modelling for carbon monoxide (CO) in the event of a fire at the BESS.[25] The results indicated that the maximum predicted range for AEGL-2 concentrations of CO will be 356 metres under F1.5 conditions,[26] and 168 metres under D3 conditions.[27] Because the closest residence is located 330 metres from a BESS unit, it could experience concentrations of CO in excess of AEGL-2 in the event of a fire under F1.5 conditions. Concord explained that F1.5 conditions are recommended by the above agencies for this type of modelling as these parameters produce the most conservative results, but that D3 conditions are more likely to occur at any given time.

20. Despite its assessment that there is potential for exposure to AEGL-2 concentrations of CO at nearby residences, Concord believed the likelihood of a thermal runaway event to be extremely low given the significant and growing number of stationary BESS currently in operation and the relatively infrequent occurrences of thermal runaway events. Concord also explained that, to qualify under the worst-case scenario (F1.5), potentially affected residences will need to meet three criteria simultaneously: residences will need to be downwind of a fire (the wind must be blowing from a specific direction), wind speeds must be low, and stable atmospheric conditions must be present.[28] Based on the wind rose for the area, Concord

---

21 RWDI noted that it had not considered additional guidelines as AEGL values for HF are well established, and that the AEGL system is preferred to other guidelines as they have been established to protect sensitive individuals (young, old, or sick) as opposed to normal individuals specified in other guidelines.

22 AEGL-2 is characterized by HF concentrations above 24 parts per million but below 44 parts per million, over an average time of 60 minutes.

23 Exhibit 27216-X0031, Attachment 1 - 20220630 RWDI AirQuality CoaldaleBESSFire, PDF page 8.

24 Exhibit 27216-X0031, Attachment 1 - 20220630 RWDI AirQuality CoaldaleBESSFire PDF page 9.

25 Exhibit 27216-X0041, Coaldale BESS - IR Round 3_FINAL, PDF page 2.

26 F1.5 conditions indicate a Pasquill-Gifford stability class of F and a wind speed of 1.5 metres per second. Class F characterizes stable atmospheric conditions, which means less dispersion of contaminants in the event of a release. A low wind speed of 1.5 metres per second will also limit mixing and keep contaminants closer to the ground.

27 D3 conditions indicate a Pasquill-Gifford stability class of D and a wind speed of 3 metres per second. Class D characterizes neutral atmospheric stability and 3 metres per second is a moderate wind speed.

28 Concord provided a wind rose for the area which indicated that winds blow predominantly from the southwest and west-southwest, and at speeds generally greater than two metres per second.

anticipated that potential residences could expect to see winds from the worst-case scenario direction, below two metres per second, less than one per cent of the time.[29] Concord noted that this number does not account for the presence of a stable atmosphere, which occurs separately from low wind conditions.

21. Concord has provided a thorough explanation of its methodology in conducting its assessment, which is based on conservative assumptions. Given the discussion above, the Commission understands that the likelihood of a thermal runaway event occurring at the Coaldale Solar Project BESS is low. When combined with the low likelihood of the F1.5 conditions occurring, the probability of the nearest residences experiencing hazardous levels of CO exposure is even lower.

22. The Commission is satisfied that Concord has selected a BESS model that has been tested for high temperature conditions with built-in safety features such as a thermal management system, battery cell monitoring, and fire detection and suppression. The Commission notes that once operational, the project itself will be subject to 24/7/365 monitoring.

23. The Commission is satisfied that Concord's risk assessment is reasonable and appropriate. In its assessment, Concord provided results for a worst-case release event under the worst-case meteorological conditions. In the event of a fire, under a worst-case environmental scenario (F1.5 conditions),[30] there will not be a release of HF at concentrations causing harm at any of the nearby residences, and only in an unlikely situation would there be concentrations of CO at nearby residences that exceed AEGL-2 levels: the wind would have to be blowing a certain direction; wind speeds would have to be below two metres per second; and there would have to be a stable atmosphere. Concord has explained that it is extremely unlikely for all the above factors to occur simultaneously.

24. Concord met with the manager of fire services for Lethbridge County to discuss emergency response planning. In the event of an emergency, the Coaldale and Picture Butte fire departments will respond. Although both departments have completed basic training for fighting fires at battery emergencies, Concord committed to providing on-site training for the fire departments following commissioning.[31] The Commission believes that local responders should be trained by the time the BESS is operational, not afterwards. The Commission therefore imposes the following condition of approval:

- Concord shall offer on-site training for local fire departments prior to commissioning of the BESS.

25. Concord stated that a site-specific emergency response plan is currently in development and will be finalized at least 30 days prior to construction commencement. Concord committed to developing the plan in co-operation with and with the approval of the local county and fire responders. Concord has contracted the development of the emergency response plan to a company that specializes in emergency response planning for battery projects.[32] Concord intends

[29] Exhibit 27216-X0047, Coaldale BESS - IR Round 4_FINAL, PDF page 4.
[30] Concord explains why it selected the F 1.5 parameter in Exhibit 27216-X0047, Coaldale BESS - IR Round 4_FINAL, PDF page 3.
[31] Exhibit 27216-X0024, Coaldale BESS - IR Round 1_FINAL, PDF page 3.
[32] Exhibit 27216-X0047, Coaldale BESS - IR Round 4_FINAL, PDF page 5.

to review the emergency response plan annually, and adjust or update it as necessary.[33] Concord committed to providing a copy of the site-specific emergency response plan to Lethbridge County once finalized. Accordingly, the Commission imposes the following condition of approval:

- Concord, and any subsequent operator, shall continually update and improve its emergency response program including its site-specific emergency response plans, and make any changes required to incorporate input received from local fire departments on mitigation measures and other related requirements, and from interested stakeholders and local residents. The updated plans are to be provided to local fire departments.

26. When asked whether it had notified nearby residents about the safety risks associated with the BESS, Concord explained that notification of this type is not typical for low risk scenarios. Concord noted that it had provided the air quality assessment report to Lethbridge County emergency services, and that it intends to continue consulting with emergency services on the matter. Concord committed to providing a copy of the project's air quality assessment report and completed emergency response plan to any stakeholders who request a copy.

27. The Commission is satisfied that Concord has adequately identified, assessed and mitigated potential risks to nearby residents in the event of a fire or emergency at the BESS. Based on the discussion above, the Commission imposes the following additional conditions of approval:

- Concord shall implement any upgrades made available by the BESS manufacturer, supplier, installer or any service provider engaged by Concord that are intended to improve the safety of the project, including but not limited to training, firmware and software enhancements, monitoring capability enhancement, process changes and safety standards, as they are developed and made available to Concord.

- Concord shall hire a qualified engineering, procurement and construction contractor who will be responsible for completing testing during commissioning to ensure that adequate safety measures are in place in the event of a fire during operations.

3.2 Other issues

28. Alberta Environment and Parks reviewed the proposed BESS addition and determined that there was no change to wildlife or wildlife habitat as outlined in the project's current renewable energy referral report. Concord added that the original environmental evaluation completed for the Coaldale Solar Project remains valid and no additional environmental studies or monitoring are required for the project.

29. The Commission is satisfied that Alberta Environment and Parks has reviewed the proposed addition and has no further comments. The Commission accepts Concord's decision to continue observing the project's original environmental evaluation.

[33] Exhibit 27216-X0024, Coaldale BESS - IR Round 1_FINAL, PDF page 1.

30. Concord has not yet developed a specific decommissioning plan for the project. Concord noted that the project's decommissioning plan will include the removal, dismantling, and shipping of the different components involved, and the final recycling plan will be in accordance with the regulations in place at the time of decommissioning. Concord further noted that because BESS units are modular, they are hauled away and recycled at end of life. Concord indicated that funds will be available at the end of life to cover the cost of decommissioning and reclamation. Concord also stated that it has posted security in favour of the landlord under the lease to ensure the sites are reclaimed.

31. Due to the potential risks associated with a new technology such as the proposed BESS, the Commission considers proper third-party liability insurance coverage as necessary and accordingly, imposes the following condition of approval:

- Concord, and any subsequent operator, shall at all times during the construction and operation of the project, maintain insurance coverage that is sufficient to protect against any reasonably foreseeable liabilities.

32. The NIA submitted by RWDI predicted that the project will comply with applicable permissible sound levels at all receptors. The Commission is satisfied with RWDI's conclusion that the project will comply with Rule 012.

33. In addition to notifying stakeholders within 2,000 metres of the project, Concord also notified Lethbridge County of its application. The Commission finds Concord's participant involvement program meets the requirements of Rule 007: *Applications for Power Plants, Substations, Transmission Lines, Industrial System Designations, Hydro Developments and Gas Utility Pipelines*, and notes that the only parties who intervened in the proceeding have withdrawn their opposition to the project.

34. In light of the foregoing, and subject to the conditions set out in this decision and commitments undertaken by Concord, the Commission considers the application to be in the public interest in accordance with Section 17 of the *Alberta Utilities Commission Act*.

4 Decision

35. Pursuant to sections 11 and 19 of the *Hydro and Electric Energy Act*, the Commission approves the application and grants Concord Coaldale GP2 Ltd. the approval set out in Appendix 1 – Power Plant Approval 27216-D02-2022 to alter and operate the Coaldale Solar Project (Appendix 1 will be distributed separately).

Dated on November 4, 2022.

Alberta Utilities Commission

(original signed by)

Cairns Price
Panel Chair

(original signed by)

Matthew Oliver, CD
Commission Member

(original signed by)

John McCarthy
Acting Commission Member

Appendix A – Summary of Commission conditions of approval in the decision

This section is intended to provide a summary of all conditions of approval specified in the decision for the convenience of readers. Conditions that require subsequent filings with the Commission will be tracked as directions in the AUC's eFiling System. In the event of any difference between the conditions in this section and those in the main body of the decision, the wording in the main body of the decision shall prevail.

The following are conditions of Decision 27216-D01-2022 that do not require subsequent filings with the Commission and will be included as conditions of Power Plant Approval 27216-D02-2022:

- Concord shall offer on-site training for local fire departments prior to commissioning of the BESS.

- Concord, and any subsequent operator, shall continually update and improve its emergency response program including its site-specific emergency response plans, and make any changes required to incorporate input received from local fire departments on mitigation measures and other related requirements, and from interested stakeholders and local residents. The updated plans are to be provided to local fire departments.

- Concord shall implement any upgrades made available by the BESS manufacturer, supplier, installer or any service provider engaged by Concord that are intended to improve the safety of the project, including but not limited to training, firmware and software enhancements, monitoring capability enhancement, process changes and safety standards, as they are developed and made available to Concord.

- Concord shall hire a qualified engineering, procurement and construction contractor who will be responsible for completing testing during commissioning to ensure that adequate safety measures are in place in the event of a fire during operations.

- Concord, and any subsequent operator, shall at all times during the construction and operation of the project, maintain insurance coverage that is sufficient to protect against any reasonably foreseeable liabilities.