



EDP Renewables SH Project GP Ltd.

Sharp Hills Wind Project

September 21, 2018

Alberta Utilities Commission

Decision 22665-D01-2018

EDP Renewables SH Project GP Ltd.

Sharp Hills Wind Project

Proceeding 22665

Applications 22665-A001 to 22665-A004

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1 Decision summary

1. In this decision, the Alberta Utilities Commission must decide whether to approve applications from EDP Renewables SH Project GP Ltd. to construct and operate a power plant designated as the Sharp Hills Wind Farm and the Sedalia 363S Substation. 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 effects on the environment, given the mitigation measures ordered by the Commission.

2. The structure of this decision is as follows. The decision first lays out the applications, Commission process and pre-hearing and procedural motions that the Commission ruled on. The decision then sets out the legislative scheme that governs wind power plants.

3. Next, the decision provides an overview of the evidence in this proceeding and provides the Commission's findings on each element of the applications. These sections are organized by issue. The significant issues addressed in the decision are: EDP Renewables SH Project GP Ltd.'s consultation and participation involvement program; the project's visual impact; environmental matters; the project's noise impact assessments and the project's compliance with the AUC's regulatory requirements for noise; the project's aeronautical impacts; health and safety concerns; the project's potential impact on property values and other land use concerns; and the project's interconnection to the Alberta Interconnected Electric System. Finally, the Commission will provide its overall conclusion on the applications.

4. In reaching the determinations set out in this decision, the Commission has considered all relevant materials comprising the record of this proceeding, including the evidence and submissions provided by each party. References in this decision to specific parts of the record are intended to assist the reader in understanding the Commission's reasoning relating to a particular matter and should not be taken as an indication that the Commission did not consider all relevant portions of the record as it relates to that matter.

2 Introduction and background

2.1 Applications and Commission process

5. EDP Renewables SH Project GP Ltd. (EDP)¹ filed applications with the AUC to seek an approval to construct and operate a 298.8-megawatt (MW) wind power project and a collector

¹ In Transcript, Volume 1, page 20, lines 14-18, EDP explained that the project applicant is EDP Renewables SH Project GP Ltd., which is a direct wholly-owned subsidiary of EDP Renewables Canada Ltd. EDP Renewables Canada Ltd., in turn, is a direct wholly-owned subsidiary of EDP Renováveis SA.

substation to be designated as the Sedalia 363S Substation, in the New Brigden and Sedalia areas, pursuant to sections 11, 14, 15 and 18 of the *Hydro and Electric Energy Act*.

6. EDP began developing the project in 2015 when it acquired a land base and a meteorological tower from Alberta Wind Energy Corporation. EDP subsequently expanded the land base by signing additional agreements with landowners in the area. In 2016, EDP acquired additional project lands and another meteorological tower from Eolectric Development Inc.²

7. EDP then submitted a Phase 1 buildable area application³ for the project on May 18, 2017. The application was registered as Application 22665-A001.

8. EDP submitted a Phase 2 buildable area application, including applications to construct and operate the Sharp Hills Wind Farm, the Sedalia 363S Substation, and for interconnection of the substation on September 8, 2017. EDP's initial Phase 2 application consisted of 93 turbines, which was a subset of 102 potential turbine locations considered in the environmental evaluation for the project. The applications were registered as applications 22665-A002 to 22665-A004.

9. On December 8 and 11, 2017, EDP submitted an amendment to its applications to finalize the number of turbines, turbine locations and turbine model.

10. The Sharp Hills Wind Farm would consist of the following components:

- Eighty-three Vestas V136 3.6-MW wind turbine generators, for a total capability of 298.8 MW. The turbines would have a hub height of 132 metres and a rotor diameter of 136 metres.
- A 34.5-kilovolt (kV) collector system, consisting of primarily underground lines and some overhead lines where there is an engineering constraint or a requirement of the Special Areas Board.
- A new substation, to be designated as the Sedalia 363S Substation, for connection of the project to the Alberta Interconnected Electric System. The substation would be located in the southwest quarter of Section 16, Township 32, Range 5, west of the Fourth Meridian, near Sedalia, Alberta. The substation would consist of the following major equipment:
 - two 34.5/240-kV, 169-megavolt ampere transformers
 - one 34.5-kV switchgear building
 - two 240-kV circuit breakers

11. The project area is located within Special Area 3 and Special Area 4 in eastern Alberta. The project is approximately 18 kilometres southeast of Consort, near the hamlets of Sedalia and New Brigden.

² Transcript, Volume 1, pages 21-22, lines 15-3.

³ Rule 007: *Applications for Power Plants, Substations, Transmission Lines, Industrial System Designations and Hydro Developments*, page 18 states that an applicant may identify an area in which it proposes to construct a wind power plant and apply for approval of that area as a Phase 1 buildable area application. An applicant may then file a Phase 2 buildable area application which must include turbine locations.

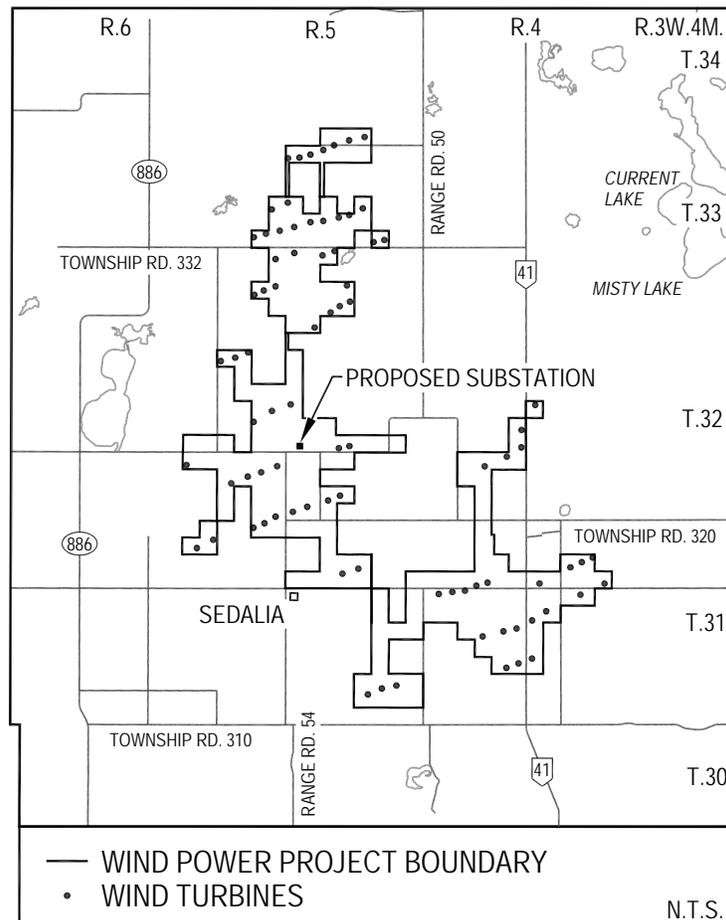
12. EDP proposed to site the project on 196 quarter sections within Special Area 3 and Special Area 4. The land optioned and leased for the project consists mainly of cultivated farmland and grazing lands with some oil and gas activity on the lands.

13. The Sharp Hills Wind Farm is proposed to be within the following locations:

Table 1. Location of Sharp Hills Wind Farm⁴

Sections	Township	Range	Meridian
9, 10, 15, 16, 17, 19, 20, 22, 23, 25, 26, 27, 28, 29, 30, 32, 33	31	4	W4M
5, 8, 9, 15, 16, 22	32	4	W4M
1, 2, 11, 12, 13, 14, 23, 24, 25, 26, 27, 28, 32, 33, 34	31	5	W4M
36	31	6	W4M
12, 13	32	6	W4M
3, 4, 5, 6, 7, 8, 9, 10, 13, 14, 15, 16, 17, 18, 19, 20, 21, 28, 30, 33	32	5	W4M
3, 4, 5, 8, 9, 10, 14, 15, 16, 17, 20, 21, 22, 23, 26, 27, 28, 34, 35	33	5	W4M

14. The location of the project is shown in the following map:



⁴ Exhibit 22665-X0053.02, Attachment 1 - Draft AUC Approval.

15. EDP stated that turbines and infrastructure were subject to setbacks and siting requirements imposed by federal jurisdiction, provincial jurisdiction including that of the AUC and Alberta Environment and Parks (AEP), and municipal jurisdiction through the Special Areas Board.

16. As EDP continued development of the project, it selected the Vestas V136 3.6-MW turbine as the project's turbine model. EDP stated that applicable setbacks take into account the dimensions of the proposed turbine. EDP indicated that the types of setbacks that are contingent on turbine blade tip height or turbine rotor diameter included:

- transportation infrastructure (e.g., provincial highways, municipal roads)
- structures (e.g., residences of landowners not hosting project infrastructure (non-participating landowners))
- radio and radar communication zones
- property boundaries
- electrical infrastructure (e.g., ATCO Electric Ltd. transmission line)
- water bodies
- oil and gas infrastructure

17. EDP submitted that these setbacks, along with the setbacks and constraints from the federal, provincial and municipal jurisdictions, were applied when designing the project. EDP stated that the applicable setbacks are specific to the size and sound power of the proposed turbines and would be sufficient to achieve the safety, noise control, and other objectives for which they were designed.

18. The Special Areas Board Land Use Order controls the use and development of land and buildings within Special Areas 2, 3 and 4, and sets out a number of requirements specific to wind power plants.⁵ With respect to the Special Areas Board setbacks, EDP stated that the Special Areas Land Use Order requires turbines to be located the greater of:

- A 550-metre setback distance from the property line of a non-participating landowner; or
- A distance at which the modelled sound level is not exceeding the AUC dwelling setback requirement measured from the nearest property line to the nearest tower base.

19. The Commission issued notices of applications for the project on June 13, 2017, and September 25, 2017. The Commission held public information sessions in the hamlet of Sedalia on July 10, 2017, and in the town of Oyen on October 12, 2017. The Commission issued a notice of hearing for the project on February 22, 2018, and an updated notice of hearing on March 21, 2018.

⁵ Exhibit 22665-X0145, Tab 13 - Schedule C to Ministerial Order No. MSL 007 15 Amendment to Special Areas Land Use Order, Section 49.

20. A public hearing commenced on June 5, 2018, in the town of Oyen, before Chair Mark Kolesar, Commission Member Joanne Phillips and Commission Member Tracee Collins, to consider evidence in the proceeding. The evidentiary portion of the hearing and oral argument concluded in Calgary on June 13, 2018. EDP submitted written reply argument on June 15, 2018.

21. The primary participants in the hearing were the applicant, EDP, and an intervener group identifying itself as the Clearview Group. The Clearview Group consisted of approximately 62 individuals and families who had concerns with the project.⁶ Thirty-nine individuals and families identifying themselves as Clearview Group members were granted standing.⁷ Steelhead Petroleum Ltd. filed a statement of intent to participate in the proceeding, but subsequently withdrew its concerns. EDP also submitted 14 letters of support for the project.⁸

22. All submissions were reviewed by the panel and taken into account in coming to their decision. A copy of the Commission's ruling on standing is attached in Appendix E.

2.2 Motions during the hearing

2.2.1 Motion to exclude testimony of experts by Clearview Group

23. During the hearing, the Clearview Group brought forward a motion to have EDP's witnesses from RWDI AIR Inc. (RWDI), Tetra Tech EBA Inc. (Tetra Tech)⁹ and WSP Canada Inc. (WSP) (the companies) "disqualified on the basis that they are not independent and non-partisan, as required by Section 19.2 paragraph (d) of the AUC's Rules of Practice."¹⁰

24. The Clearview Group submitted that AUC Rule 001: *Rules of Practice* provides that independent witnesses have a duty to provide evidence that is fair, objective and non-partisan, and evidence adduced in cross-examination shows that the companies actively support and earn revenue from the wind energy industry, and are not objective or non-partisan.¹¹ The Clearview Group cited the Supreme Court of Canada decision *White Burgess Langille Inman v. Abbott and Haliburton Co.* (*White Burgess*)¹² in support of its motion, in which the court stated that an expert's opinion must be: (i) impartial "in the sense that it reflects an objective assessment of the questions at hand"; (ii) independent "in the sense that it is the product of the expert's independent judgment"; and (iii) unbiased "in the sense that it does not unfairly favour one party's position over another."¹³ The Clearview Group submitted that the EDP witnesses "are advocates for wind energy" based on statements made on the companies' respective websites, the evidence adduced about how much of their revenues come from supporting the wind energy industry, and their

⁶ Exhibit 22665-X0158, Submissions of the Clearview Group.

⁷ Exhibit 22665-X0108, AUC ruling on standing.

⁸ Exhibit 22665-X0134, Sharp Hills Wind Farm - AUC Proceeding 22665 Project Support Letters- April 19, 2018.

⁹ Tetra Tech EBA Inc. and Tetra Tech Canada Inc. are referred to collectively in this decision as Tetra Tech.

¹⁰ Transcript, Volume 1, page 49, lines 15-20.

¹¹ Transcript, Volume 1, pages 49-50, lines 21-3.

¹² *White Burgess Langille Inman v. Abbott and Haliburton Co.*, 2015 SCC 23, [2015] 2 S.C.R. 182, paragraphs 26, 32, 45, 49.

¹³ *White Burgess*, paragraph 32.

membership in wind energy associations.¹⁴ The Clearview Group also noted that the Commission adopted the analysis laid out in *White Burgess* in Decision 3110-D01-2015.¹⁵

25. EDP noted that pursuant to Rule 001, experts are required to give an acknowledgment that the evidence they gave was objective and non-partisan. EDP submitted that all of the experts in this case had done so. EDP submitted that “the mere fact that the consulting companies that they work for are members of industry -- and industry organization[s]” is not evidence that the witnesses are not objective or impartial.¹⁶ EDP further submitted that the statement that the companies in question only work for developers is not true, as Tetra Tech works for government at all levels and for First Nations.¹⁷

26. EDP stated that a similar issue arose in Decision 2014-040, where the Commission concluded:

The Commission is not prepared to disregard the evidence provided by the KLG experts solely because they are members of the Society for Wind Vigilance or a similar organization, nor is it prepared to disregard the evidence provided by the applicant’s witnesses because they have previously testified on behalf of other wind developers. If the Commission accepted these arguments the result would be the exclusion of much of the evidence filed in this proceeding. While such affiliations are a factor that the Commission may take into account when assessing each expert’s objectivity, it must consider a number of other factors when determining the overall weight to give each expert’s evidence. In the Commission’s view, the best place for this analysis is within the sections of this decision in which the expert’s evidence is discussed.¹⁸

27. The Commission denied the Clearview Group’s motion, noting that the threshold test for admissibility of expert evidence is that an expert must provide evidence that is fair, impartial, and non-partisan. The Commission found that the Clearview Group had not established that the witnesses in question would not be able to satisfy this threshold.¹⁹ The Commission noted that each of the witnesses made the attestation required by Section 19.1(d) of Rule 001 and contemplated in the *White Burgess* decision. The Commission quoted paragraph 48 of *White Burgess*, which stated:

Once the expert attests or testifies on oath to this effect, the burden is on the party opposing the admission of the evidence to show that there is a realistic concern that the expert’s evidence should not be received because the expert is unable and/or unwilling to comply with that duty. If the opponent does so, the burden to establish on a balance of probabilities this aspect of the admissibility threshold remains on the party proposing to call the evidence. If this is not done, the evidence, or those parts of it that are tainted by a lack of independence or impartiality, should be excluded.

...

¹⁴ Transcript, Volume 1, page 52-53, lines 11-6.

¹⁵ Decision 3110-D01-2015: Market Surveillance Administrator, Market Surveillance Administrator allegations against TransAlta Corporation et al., Proceeding 3110, July 27, 2015; Transcript, Volume 1, pages 50-53, lines 6-6.

¹⁶ Transcript, Volume 1, pages 54-55, lines 17-2.

¹⁷ Transcript, Volume 1, page 55, lines 7-12.

¹⁸ Decision 2014-040 (Errata): 1646658 Alberta Ltd. Bull Creek Wind Project, Proceeding 1955, Application 1646658, March 10, 2014, paragraph 52.

¹⁹ Transcript, Volume 1, page 62, lines 12-17.

This threshold requirement is not particularly onerous and it will likely be quite rare that a proposed expert's evidence would be ruled inadmissible for failing to meet it.²⁰

28. The Commission further noted that the court in *White Burgess* emphasized “that exclusion at the threshold stage of the analysis should occur only in very clear cases in which the proposed expert is unable or unwilling to provide the court with fair, objective and non-partisan evidence.”²¹

29. The Commission did not consider that these circumstances constituted a very clear case as discussed by the Supreme Court, and accordingly denied the motion.²²

2.2.2 Motion to exclude the Altus report

30. The Clearview Group also brought forward a motion during the oral hearing to strike a property value report prepared by Altus Group Limited (the Altus report) from the record. The Clearview Group argued that the author of the report was not made available for questioning at the hearing and therefore the report should not form part of the record. The Clearview Group stated that no one on the witness panel was an accredited appraiser and that filing an expert report without making that expert available for questioning is not consistent with prior practice before the Commission.²³

31. EDP submitted that the report should remain on the record, noting that its witnesses adopted all of the evidence and indicated it was prepared at their direction, in response to concerns raised by landowners in the Clearview Group. EDP submitted that it was not tendered as an expert opinion and was helpful information on available literature, and is not prejudicial in any way.²⁴

32. The Commission granted the Clearview Group's motion and struck the Altus report from the record of the proceeding. The Commission considered that EDP did not bring forward the author of the document, nor any of the authors of the documents that were reviewed. The Commission found that the report's evidentiary value was minimal, and for those reasons struck the Altus report from the record.²⁵

3 Legislative scheme

33. The Commission regulates the construction and operation of power plants in Alberta. The wind generation project proposed by EDP is a “power plant” as that term is defined in Subsection 1(k) of the *Hydro and Electric Energy Act*. Section 11 of the *Hydro and Electric Energy Act* states that no person may construct or operate a power plant without prior approval from the Commission. Sections 14 and 15 of the *Hydro and Electric Energy Act* direct that approval from the Commission is necessary prior to constructing or operating a substation or a

²⁰ Transcript, Volume 1, page 62, line 24 to page 63, line 25, citing *White Burgess*, paragraph 48.

²¹ Transcript, Volume 1, page 64, line 1 to page 65, line 18, citing *White Burgess*, paragraph 49.

²² Transcript, Volume 1, pages 62-65, lines 18-22.

²³ Transcript, Volume 1, pages 162-163, lines 25-21.

²⁴ Transcript, Volume 1, page 163-164, lines 22-10.

²⁵ Transcript, Volume 1, page 165, lines 11-19.

transmission line,²⁶ and Section 18 directs that Commission approval is required to connect a power plant to the transmission system. Section 19 then provides that the Commission can approve or deny the application, or approve the application subject to any terms and conditions it prescribes.

34. Accordingly, EDP has applied to construct and operate the project pursuant to sections 11, 14, 15 and 18 of the *Hydro and Electric Energy Act*.

35. When considering an application for a power plant and associated infrastructure, the Commission is guided by sections 2 and 3 of the *Hydro and Electric Energy Act*, and Section 17 of the *Alberta Utilities Commission Act*.

36. Section 2 lists the purposes of the *Hydro and Electric Energy Act*. Those purposes include:

- To provide for the economic, orderly and efficient development and operation, in the public interest, of the generation of electric energy in Alberta.
- To secure the observance of safe and efficient practices in the public interest in the generation of electric energy in Alberta.
- To assist the government in controlling pollution and ensuring environment conservation in the generation of electric energy in Alberta.

37. Section 3 of the *Hydro and Electric Energy Act* requires the Commission to have regard for the purposes of the *Electric Utilities Act* when assessing whether a proposed power plant and associated infrastructure is in the public interest under Section 17 of the *Alberta Utilities Commission Act*. The purposes of the *Electric Utilities Act* include the development of an efficient electric industry structure and the development of an electric generation sector guided by competitive market forces.²⁷

38. In Alberta, the legislature expressed its clear intention that electric generation is to be developed through the mechanism of a competitive, deregulated electric generation market. Section 3 of the *Hydro and Electric Energy Act* directs that the Commission shall not have regard to whether the proposed power plant "...is an economic source of electric energy in Alberta or to whether there is a need for the electric energy to be produced by such a facility in meeting the requirements for electric energy in Alberta or outside of Alberta." Accordingly, in considering an application before it, the Commission does not take into account the potential need and cost of a project.

39. Section 3(1)(c) of the *Hydro and Electric Energy Act* also provides that the Commission "shall not have regard to whether the generating unit is the subject of a renewable electricity support agreement under the *Renewable Electricity Act*".

²⁶ Defined in Section 1(1)(o)(iii) of the *Hydro and Electric Energy Act*, RSA 2000, c H-16, "transmission line" includes substations.

²⁷ *Electric Utilities Act*, SA 2003, c E-5.1, Section 5.

40. The Commission's public interest mandate is located within Section 17 of the *Alberta Utilities Commission Act*, which states:

Public interest

17(1) Where the Commission conducts a hearing or other proceeding on an application to construct or operate a hydro development, power plant or transmission line under the *Hydro and Electric Energy Act* or a gas utility pipeline under the *Gas Utilities Act*, it shall, in addition to any other matters it may or must consider in conducting the hearing or other proceeding, give consideration to whether construction or operation of the proposed hydro development, power plant, transmission line or gas utility pipeline is in the public interest, having regard to the social and economic effects of the development, plant, line or pipeline and the effects of the development, plant, line or pipeline on the environment.

41. The Commission has discussed its approach to fulfilling its mandate to assess the public interest in various decisions in the context of different types of applications. In Decision 2001-111,²⁸ the Alberta Energy and Utilities Board (the Commission's predecessor) set out its approach to assessing whether the approval of a power plant is in the public interest as follows:

The determination of whether a project is in the public interest requires the Board to assess and balance the negative and beneficial impacts of the specific project before it. Benefits to the public as well as negative impacts on the public must be acknowledged in this analysis. The existence of regulatory standards and guidelines and a proponent's adherence to these standards are important elements in deciding whether potential adverse impacts are acceptable. Where such thresholds do not exist, the Board must be satisfied that reasonable mitigative measures are in place to address the impacts. In many cases, the Board may also approve an application subject to specific conditions that are designed to enhance the effectiveness of mitigative plans. The conditions become an essential part of the approval, and breach of them may result in suspension or rescission of the approval.

In the Board's view, the public interest will be largely met if applications are shown to be in compliance with existing provincial health, environmental, and other regulatory standards in addition to the public benefits outweighing negative impacts.²⁹

42. The Commission is of the view that the above approach to assessing whether a project is in the public interest is consistent with the purpose and intent of the statutory scheme. Further, the Commission considers that this approach provides an effective framework for the assessment of wind energy projects.

43. AUC Rule 007: *Applications for Power Plants, Substations, Transmission Lines, Industrial System Designations and Hydro Developments* applies to an application for the construction and operation of power plants, substations and transmission lines, which are governed by the *Hydro and Electric Energy Act*. The application must meet the informational and other requirements set out in Rule 007. Specifically, an applicant must provide technical and functional specifications, information on public consultation, environmental and land use information including a noise impact assessment. The application must also meet the

²⁸ EUB Decision 2001-111: EPCOR Generation Inc. and EPCOR Power Development Corporation 490-MW Coal-Fired Power Plant, Application 2001173, December 21, 2001, page 4.

²⁹ Decision 2014-040, page 16.

requirements set out in AUC Rule 012: *Noise Control*. Further, an applicant must obtain all approvals under other applicable provincial or federal legislation.

4 Consultation

44. Rule 007 includes a number of requirements for an applicant's participant involvement program, including that the applicant is expected to ensure that information is conveyed in an understandable manner to the public and that the project is discussed with the widest possible audience as early as practical. The purpose of a public consultation program is to inform parties whose rights may be directly and adversely affected by a project. The participant involvement program should obtain feedback and suggestions with respect to the project, with a view to modifying the project to reduce impacts on parties whose rights may be directly and adversely affected to the extent practical. The applicant is required to make all reasonable attempts to contact potentially directly and adversely affected persons to discuss the project and address any questions or concerns.

45. Rule 007 requires public notification to all occupants, residents and landowners within 2,000 metres from the edge of the proposed power plant site boundary, and to populated areas just outside that limit for major power plant applications. The applicant must provide personal consultation to all occupants, residents and landowners within 800 metres from the proposed power plant site boundary.

46. The Commission and its predecessor, the Alberta Energy and Utilities Board, have previously expressed what is expected of applicants in conducting an effective notification and consultation program. In Decision 2008-006, the Board stated that "...the program should include responding to questions and concerns, discussing options, providing alternatives and potential mitigation measures, and seeking confirmation that potentially affected parties do not object." The Board went on to state that it "...expects applicants to be sensitive to timing constraints the public may have especially when dealing with landowners engaged in agricultural endeavours."³⁰

4.1 Views of EDP

47. EDP stated that it developed its participant involvement program with the intent of building trust, credibility and respectful relationships with landowners and other stakeholders potentially affected by or interested in the project, and with the intent of meeting or exceeding the notification and consultation requirements in Rule 007.³¹

48. EDP conducted three rounds of its participant involvement program to help identify concerns with the project. Each round coincided with a different phase of the project's development. EDP conducted a participant involvement program for the Phase 1 buildable area application, the Phase 2 buildable area application, and the Phase 2 buildable area application amendment.

49. As part of its participant involvement program, EDP personally consulted with landowners, residents and occupants within 800 metres of the project boundary and notified

³⁰ EUB Decision 2008-006: Montana Alberta Tie Ltd. 230-kV International Merchant Power Line Lethbridge, Alberta to Great Falls Montana, Applications 1475724, 1458443 and 1492150, January 31, 2008, page 36.

³¹ Exhibit 22665-X0198, EDPR SHWF Reply Evidence Summary, pages 17-18, paragraph 70.

stakeholders within 2,000 metres by mailing project-specific information packages and updates. Where a stakeholder could not be contacted, EDP stated that it made reasonable attempts to contact them. If EDP was not able to reach the stakeholder at the address listed on their most current land title, EDP made a minimum of three attempts to contact these stakeholders using other avenues.

50. EDP set up a project website, a toll-free voice mail box and an email address for questions, concerns or other feedback. EDP held open houses for the project on February 15 and August 17, 2017, in Sedalia. EDP also held a supply-chain open house in the town of Oyen on April 12, 2018, to assist in the identification of local businesses that could provide services to the project.

51. Mr. Thomas LoTurco, director of development for EDP Renewables Canada Ltd., explained EDP's approach to its participant involvement program. He testified that:

Through three rounds of consultation activities over the past two years, we engaged 278 stakeholders and continued to maintain open communication through the distribution of regular mailouts, hosting open houses, and holding numerous phone and in-person meetings with individual stakeholders.

We take the concerns of all stakeholders, including the members of the Clearview Group, very seriously and have sought to receive and respond to concerns throughout project development. We are committed to ongoing consultation with stakeholders throughout the project's lifespan and to being a good neighbour and an active member of the Sedalia and New Brigden communities.³²

52. EDP submitted 14 letters from stakeholders and other parties in support of the project that included praise for EDP's consultation. One stakeholder stated that the communication from EDP was consistent, regular, professional and clear.³³ Mr. Douglas Jones, mayor of Oyen, stated that "EDP has been committed to proactive, open, personal and comprehensive community engagement,"³⁴ and that "[w]e are confident that [EDP] and the Sharp Hills Wind Farm will continue to be an integral and positive member of our community, and hereby offer our full support of the Applicant."³⁵

53. EDP stated that it responded to Clearview Group members and others that filed statements of intent to participate in response to the notices of applications. For example, EDP responded to a landowner's concerns by making a commitment with Clearview Group member Mr. Jim Ness to maintain agreed-upon constraints from his active airstrip. EDP explained that these constraints were specifically requested in the multiple in-person consultations from 2015 to 2017. In a letter sent to Mr. Ness dated July 31, 2017, EDP affirmed this commitment and stated that it would continue to work with Mr. Ness and his lawyer.³⁶

³² Transcript, Volume 1, page 26, lines 3-16.

³³ Exhibit 22665-X0134, Sharp Hills Wind Farm - AUC Proceeding 22665 Project Support Letters-April 19, 2018, page 8.

³⁴ Exhibit 22665-X0134, Sharp Hills Wind Farm - AUC Proceeding 22665 Project Support Letters-April 19, 2018, page 15.

³⁵ Exhibit 22665-X0134, Sharp Hills Wind Farm - AUC Proceeding 22665 Project Support Letters-April 19, 2018, page 15.

³⁶ Exhibit 22665-X0047, EDPR Response to Interveners - Part1, page 1.

54. Clearview Group member Mr. Lloyd Wagstaff raised concerns that EDP failed to meaningfully consult with local residents. In response, EDP stated that while Mr. Wagstaff was a participating landowner in the context of Phase 1 of the project, he refused to engage with EDP during the Phase 2 buildable area and Phase 2 amendment consultation programs, despite multiple attempts at making contact.³⁷ EDP explained that it originally requested Mr. Wagstaff to sign setback waivers to enable the placement of turbines on his lands. Project infrastructure was ultimately removed from Mr. Wagstaff's property due to the turbines' expected productivity being less than the average project turbine. EDP explained that the decision to remove Mr. Wagstaff's lands from the project area was made notwithstanding his agreement to execute a setback waiver. EDP stated that it sought to explain this decision to Mr. Wagstaff in-person, but its attempts at contacting him were unsuccessful.

4.2 Views of the Clearview Group

55. The Clearview Group submitted that EDP failed to meaningfully consult with local residents. Many of the Clearview Group members testified about EDP's consultation.

56. Clearview Group member Mr. Sheldon Kroker took issue with the information that was provided by EDP. He testified that:

A lot of information about the project is not always clear and does not appear to apply to the circumstances in our area. We as a group and as individuals do not have access nor the time needed to sift through all the different aspects of EDP's plans and submissions. We have tried our best to be informed, but many questions remain unanswered.³⁸

57. Clearview Group member Ms. Coleen Blair testified that:

We never gave any indication that we would be signing up our land, and our neighbours knew of our intentions. It came to our attention that Mr. [Ryan] O'Connor [EDP Renewables North America LLC's development project manager] told one of our neighbours that he had a firm commitment from us to sign for the project, as well as some of his other surrounding neighbours. This was a complete and bold-faced lie.

When my husband asked Mr. O'Connor about this, his answer was that he had no control of how other people interpreted what he said. From that moment on, there was not a chance that we would have anything to do with a company who would go behind our back and lie about what we say to our neighbours. It damages our character and our integrity in the community. That is how division in communities is started, with false information.

[...]

EDP has shown us that they will say or do anything to get people to sign, and I wonder how many of their contracts were completed with false information and bullying.

[...]

EDP spoke of trust and respect in the community, something that was not earned from us. We will not be interested in ever dealing with EDP in the future. We ask the Commission to please reconsider moving forward with this project.³⁹

³⁷ Exhibit 22665-X0198, EDPR SHWF Reply Evidence Summary, page 18, footnote 48.

³⁸ Transcript, Volume 3, page 635, lines 9-15.

³⁹ Transcript, Volume 3, pages 675-677.

58. Clearview Group member Mr. Lloyd Wagstaff also raised concerns about his interactions with EDP. He originally signed a Surface Access and Lease Agreement with the original project proponent⁴⁰ and was content to host turbines on his land. Mr. Wagstaff stated that after EDP took over the project, it demanded that he sign a setback waiver on nearby land that he owns, but when he refused, EDP pulled the turbines from his land. Mr. Wagstaff testified that:

Ryan O'Connor said to me, pointing his finger -- he said, "You will regret not signing these papers." And I said, "This meeting is over, and there's the door." Ryan O'Connor left me a message on the phone the next day that I have been taken out of the project.⁴¹

59. Mr. Wagstaff also stated that Mr. O'Connor told him that EDP had secured setback waivers from his neighbours, but he knew that was not the case.⁴²

60. Clearview Group member Mr. Hugh Ross questioned why EDP did not continue to hold town hall meetings informing the entire community about its plans as a whole. He also testified that EDP had signed-up unsuspecting farmers without disclosing the height of the towers.⁴³

4.3 Commission findings

61. Rule 007 states that a participant involvement program must be conducted before a facility application is filed with the Commission. It is therefore a fundamental component of any facility application. It is the applicant's responsibility to satisfy the notification and consultation requirements under Rule 007.

62. In Decision 2011-436, the Commission made the following comments with respect to effective consultation under Rule 007:

... In the Commission's view, effective consultation achieves three purposes. First, it allows parties to understand the nature of a proposed project. Second, it allows the applicant and the intervener to identify areas of concern. Third, it provides a reasonable opportunity for the parties to engage in meaningful dialogue and discussion with the goal of eliminating or mitigating to an acceptable degree the affected parties concerns about the project. If done well, a consultation program will improve the application and help to resolve disputes between the applicant and affected parties outside of the context of the hearing room.⁴⁴

63. The Commission acknowledges that an effective consultation program may not resolve all landowner concerns. There may be situations where individual stakeholders consider that the consultation effort, as it pertained to their interests specifically, was insufficient or superficial. The above-noted views of the parties demonstrate that the perceptions of the applicant and some interveners about the quality and effectiveness of the public consultation are quite different.

⁴⁰ Alberta Wind Energy Corporation and Electric Development Inc.: Transcript, Volume 1, pages 21-22, lines 15-3.

⁴¹ Transcript, Volume 3, page 726, lines 4-9.

⁴² Transcript, Volume 3, page 725, lines 4-16.

⁴³ Transcript, Volume 3, page 785, lines 2-6.

⁴⁴ Decision 2011-436: AltaLink Management Ltd. and EPCOR Distribution & Transmission Inc. – Heartland Transmission Project, Proceeding 457, Application 1606609, November 1, 2011, page 57, paragraph 283.

64. The Commission finds that the participant involvement plan designed by EDP met the requirements of Rule 007 in the following ways:

- project-specific mail outs to stakeholders were distributed
- personal and phone consultations were conducted with stakeholders within the project area
- multiple open houses were held
- a project website was available
- ongoing efforts were made to address landowner concerns as they arose

65. The Commission finds that the efforts made by EDP to ensure that there were multiple avenues for landowners to obtain information or contact EDP satisfy the requirements of Rule 007. The Commission also finds that EDP appears to have been generally receptive and responsive when dealing with concerns raised by landowners.

66. The Commission concludes that EDP's consultation and participant involvement program satisfies the regulatory requirements of Rule 007.

5 Visual impact

5.1 Introduction

67. The Clearview Group raised concerns with the visual impact of the project, mainly relating to the size of the 83 proposed Vestas V136 3.6-MW wind turbines. Each turbine would have a hub height of 132 metres and a rotor diameter of 136 metres, for a maximum height of 200 metres when the turbine blade is at its peak.

68. EDP retained WSP to create visual simulations⁴⁵ of the project and to provide an opinion on the visual impact associated with the project. Mr. Rob McDonnell from WSP prepared a report⁴⁶ and testified at the hearing.

69. The Clearview Group retained Dr. Ken Fairhurst from RDI Resource Design Inc. (RDI) to provide a visual effect assessment of the proposed project and create separate visual simulations⁴⁷ of the project. Dr. Fairhurst prepared a report⁴⁸ and testified at the hearing. The Clearview Group also retained a graphic designer to prepare simulations⁴⁹ showing the height and scale of the turbines.

⁴⁵ Exhibit 22665-X0076, Attachment 2B - Appendix H - Part 6 of 13, Exhibit 22665-X0077, Attachment 2B - Appendix H - Part 7 of 13.

⁴⁶ Exhibit 22665-X0199, Appendix A - Visual - SHWF Reply Evidence – WSP.

⁴⁷ Exhibit 22665-X0135, Tab 21 - Appendix 2, Part B of Evidence of K. Fairhurst re Visual Impacts, Exhibit 22665-X0136 Tab 21 - Appendix 2, Part A of Evidence of K. Fairhurst re Visual Impact and Exhibit 22665-X0293, Undertaking Response (undertaking given by Dr. Ken Fairhurst to a request from the Commission).

⁴⁸ Exhibit 22665-X0137, Tab 21 - Evidence of Ken Fairhurst dated April 17, 2018 re Visual Impacts.

⁴⁹ Exhibit 22665-X0147, Tab 11 - Turbine Simulations.

5.2 Views of EDP

70. EDP acknowledged at the hearing that the project's proposed turbines would have the highest maximum blade tip height that the Commission has ever been asked to approve, but it argued that there is "nothing unique about this fact."⁵⁰ EDP referred to a letter from AEP which characterized the size of the proposed turbines as the "next generation" turbine size, and stated that it "is typical of most current wind projects across the province."⁵¹ EDP stressed that since Canada's commercial wind energy industry began in Alberta, turbine technology has continued to develop and the Commission has been asked to approve larger and larger turbines as the technology has progressed.

71. EDP advised that it considered different turbine models with different hub heights when designing the project. EDP weighed the cost of erection with the increased productivity of each turbine and determined that the higher hub height was a better fit for the project.

72. In addition, Mr. LoTurco stated that the project site has a different wind characteristic than EDP originally thought was present in the area, and by using the selected turbines EDP would be able to produce more electricity per turbine location than originally anticipated. Mr. LoTurco explained that this meant that EDP was able to reduce the overall number of turbines for the project.

73. EDP stated that it considered the project's viewscape impacts when determining the size and number of turbines. Mr. LoTurco testified that EDP completed 42 visual simulations on a voluntary basis. He explained that in its initial visual simulations, the project had 102 turbines, as originally contemplated by EDP. As the project progressed, EDP refined the project's layout, reduced the number of turbines and updated the visual simulations accordingly.

74. With respect to the visual impact of flashing lights on the project's turbines, EDP stated that it was obligated under Transport Canada regulatory requirements to install a minimum number of lights. EDP did not intend to install more than the minimum required number of lights, and it would operate the lights at the minimum flash frequency and duration required by Transport Canada.

75. With respect to the visual impact of the project's collector system, EDP stated it would use overhead collector lines only when there is an engineering constraint or requirement from the Special Areas Board.⁵²

76. EDP had not identified any areas that it considered to be significant viewpoints in relation to the proposed Sedalia 363S Substation. EDP stated that the region in which the substation would be located has few trees, is beside a transmission line and is on cultivated and privately owned land. EDP added that because the proposed Sedalia 363S Substation would be between two transmission towers, it did not propose any mitigative measures to minimize the substation's visual effects.⁵³

⁵⁰ Transcript, Volume 5, page 1175, lines 20-23.

⁵¹ Exhibit 22665-X0143 Tab 15 - AEP Response to Letter dated February 16 2018-to Mr. Gavin S. Fitch, page 3.

⁵² Exhibit 22665-X0069.02, EDPR Sharp Hills AUC Phase 2 Application 08SEP2017, page 44.

⁵³ Exhibit 22665-X0069.02, EDPR Sharp Hills AUC Phase 2 Application 08SEP2017, page 54, TS36).

77. Mr. McDonnell stated that visual simulations are developed to represent the appearance of a proposed project in the context of the existing landscape, and are the basis for many of the conclusions regarding visual impact. He submitted that precision and technical accuracy in visual simulations is essential in order to ensure that a project is being represented accurately and that it appears realistic and convincing to the viewer. Mr. McDonnell set out specific photography process guidelines that, in his opinion, must be followed to produce an accurate visual simulation of a wind farm. He stated that WSP prepared photo simulations of the project in accordance with established industry standards and professional practice.

78. Mr. McDonnell stressed that the most important aspect of simulations is their ability to be reproduced. For example, if two professionals produced simulations of the same project from the same location, looking in the same direction, the results should be the same. He emphasized that following industry accepted simulation methodology is the way to ensure defensible results.

79. In addition, when assessing visual impact and the accuracy of a visual simulation, Mr. McDonnell explained that it is important to consider the permanency of the view being depicted. Mr. LoTurco testified that when preparing visual simulations for the purposes of open houses, EDP directed WSP to select locations that would be representative of the viewscape most likely to be experienced by individuals that had filed statements of intent to participate in the proceeding or who had otherwise expressed concerns about the project. EDP explained that the closest distance to a Clearview Group member residence from a turbine would be 1.85 kilometres. EDP argued that “locations were selected having regard to the fact that members of the public are likely to routinely view turbines from roadways within the project area.”⁵⁴

80. Mr. McDonnell submitted that the Visual Nature Studio simulations prepared by Dr. Fairhurst were unrealistic and did not follow industry standard protocols for the preparation of visual simulations. EDP argued that the visual simulations prepared by RDI (Dr. Fairhurst’s company) were not realistic representations of the project because many of the simulations excluded existing landscape features such as trees, utility poles, transmission lines, distribution lines, fence posts and grain bins. EDP further argued that RDI’s simulations presented the turbines as dark against a white sky, which maximized contrast, resulting in an inaccurate depiction of the project.

81. EDP argued that Dr. Fairhurst’s decision to prepare the majority of the simulations on the basis of a few road-based foreground⁵⁵ views was not representative, because the amount of time the project would be viewed from a road would be much shorter than that experienced when spending extended periods of time at a residence near the project area. EDP also contended that turbines would rarely be visible in the foreground from roadways.

82. EDP submitted that Dr. Fairhurst’s simulations are not representative of the visual impact of the project that would be experienced by the community. EDP argued that the visual simulations prepared by WSP should be preferred over those prepared by RDI because WSP’s simulations adhered to industry standard protocols, WSP’s simulations were photo realistic, and the visual simulations prepared by RDI were inaccurate and misleading.

⁵⁴ Transcript, Volume 5, page 1189, lines 16-18.

⁵⁵ Dr. Fairhurst explained that foreground views are considered to be views less than one kilometre from a subject, midground views are considered to be views one to eight kilometres from a subject and background views are considered to be views greater than eight kilometres from a subject.

83. RDI also completed a visual effects assessment of the project and stated that this was a structured objective assessment technique to determine visual impact. EDP argued that the Commission should place limited weight on the visual effects assessment. EDP pointed out that Dr. Fairhurst acknowledged that there were no visual quality objectives established by the Alberta government in the project area, as had been done in some other jurisdictions. EDP further pointed out that Dr. Fairhurst admitted that this was the first occasion in which the system RDI used, the “Visual Landscape System,” had been used for wind projects.⁵⁶ EDP emphasized that Dr. Fairhurst acknowledged that the Visual Landscape System is not an industry standard approach; instead, it is a combination of approaches from practitioners in a range of different jurisdictions.⁵⁷

84. Dr. Fairhurst stated that a wind farm would be an acceptable alteration to a landscape in a place that has already been zoned for such an alteration.⁵⁸ He acknowledged that he had not learned about the Special Areas Board Land Use Order until the day he testified.⁵⁹ EDP took issue with Dr. Fairhurst not reviewing the Special Areas Board Land Use Order, which has a number of zoning requirements specific to wind power plants (referred to in the order as “wind energy conversion systems”).⁶⁰ EDP argued that the Special Areas Board Land Use Order addressed the issue of points of visual significance in the project area.

85. The Special Areas Board Land Use Order identifies a viewscape as follows:

Viewscape means the area visible from [sic] a point, a line, an arc, or specific locality that contain[s] historic scenic value as deemed by the Special Areas Board to be worthy of preservation from development.⁶¹

86. The Special Areas Board Land Use Order further stated that a commercial wind energy conversion system development application shall be considered in accordance with the following viewscape requirements:

(i) Viewscape

The nature of any [wind energy conversion system] requires the installation of the turbine on a tall tower to reach the appropriate wind conditions and avoid turbulence. Visual impact concerns shall be considered where there is significant scenic or historical value associated and where there is a clear public benefit.⁶²

87. EDP explained that the Special Areas Board Land Use Order requirements may address the zoning consideration that Dr. Fairhurst identified as important to assess when siting wind power projects.

⁵⁶ Transcript, Volume 5, pages 1083-1084, lines 25-2.

⁵⁷ Transcript, Volume 5, page 1188, lines 14-19.

⁵⁸ Transcript, Volume 5, page 1165, lines 5-23.

⁵⁹ Transcript, Volume 5, page 1165, lines 17-23.

⁶⁰ Exhibit 22665-X0145, Tab 13 - Schedule C to Ministerial Order No. MSL 007 15 Amendment to Special Areas Land Use Order, Section 49.

⁶¹ Exhibit 22665-X0145, Tab 13 - Schedule C to Ministerial Order No. MSL 007 15 Amendment to Special Areas Land Use Order, page 11.

⁶² Exhibit 22665-X0145, Tab 13 - Schedule C to Ministerial Order No. MSL 007 15 Amendment to Special Areas Land Use Order, page 17.

5.3 Views of the Clearview Group

88. The Clearview Group argued that the project would have a massive negative visual impact to the area. The Clearview Group pointed out that the 200-metre-tall turbines would be taller than the Calgary Tower, but cause a far worse visual impact due to the nature of the area. Clearview Group member Mr. Nelson Hertz testified that:

[...] if you put a Calgary tower on the northwest corner of Calgary, the visual impact of that in a residential area would be completely different than if another tower went beside a tower in downtown Calgary.⁶³

89. The Clearview Group submitted that the project's turbines would be approximately 50 to 65 metres taller than turbines in the Bull Creek, Grizzly Bear Creek and Halkirk 2 projects recently approved in Alberta.⁶⁴ It also submitted that the project's turbines would be taller, by approximately 25 to 50 metres, than the RES Forty Mile, Capital Power Whitla and proposed Suncor Forty Mile projects in Alberta.⁶⁵

90. The Clearview Group emphasized that if approved, the turbines would be the tallest ever built in Alberta. The Clearview Group refuted AEP's characterization of the turbine height as being typical of most current wind projects across the province, and submitted that it was disingenuous of EDP to rely on an incorrect statement made by AEP.

91. Multiple members of the Clearview Group expressed their concerns with the height of the project's turbines. Clearview Group member Ms. Blair testified that:

There is no study out there that can tell me what I should and shouldn't like when it comes to visual impact. No one has that right except for me. And I don't want to look at those monster towers every direction I turn. We do not leave our homes and go out of the area each day to work. This is our home and our work.

And I should add to that that I actually do leave my home to work, but I go to Sedalia. I'm proud to say that I work there. And when I turn north to go down my road every day to work, I will be looking at least at 50 wind towers to the north of me. I will never be happy having those towers around us.⁶⁶

92. Clearview Group member Ms. Kelly Kroker testified that:

How can one truly compare a power pole at the height of 40 metres to a 200-metre to the tip of the turbine? This is only 160-metre difference. This is almost one and a half football fields. This is one man's opinion. Where does he live? One man's beauty is another man's beast. This is the beast to the prairie farmer.⁶⁷

93. Dr. Fairhurst stated that a field observation and photography exercise was conducted in 2017, including a tour guided by Clearview Group members Mr. Sheldon Kroker and Ms. Kelly Kroker. From the information gathered, RDI used models from Visual Nature Studio and a wind farm planning software program called windPRO to prepare simulations.

⁶³ Transcript, Volume 3, page 754, lines 9-12.

⁶⁴ Transcript, Volume 5, pages 1230-1231, lines 17-2.

⁶⁵ Transcript, Volume 5, page 1231, lines 3-20.

⁶⁶ Transcript, Volume 3, page 674, lines 11-24.

⁶⁷ Transcript, Volume 3, page 653, lines 6-12.

94. Using Visual Nature Studio software, RDI prepared panoramic photography, visual simulations and photomontages of the project. The Visual Nature Studio software rendered items such as roads and vegetation. A turbine model from an online three dimensional model maker was used when RDI added the turbines to the rendering. Dr. Fairhurst stated that the simulations were generally open landscape with minimal ground cover to match the panoramic photography, and were presented on the same page as the photography for each observation point for easy reference to vegetation and structures. Dr. Fairhurst indicated that the RDI renderings were assigned bare ground attributes due to the absence of vegetative cover information and that RDI added small patches of 15-metre-high tree clumps to provide scale comparisons.

95. Dr. Fairhurst stated that the Visual Nature Studio software automatically joined each individual frame into a panorama. He explained that at times, a joining point can cause minor aberrations. Dr. Fairhurst explained that in one close view, a turbine blade was bent across two frames due to proximity and height of the frame. He also explained that in RDI's simulations, the turbines were angled consistently to the east in the absence of directional data for winds in the area, while the sun was from the south. Dr. Fairhurst stated that this combination tended to darken the turbines.⁶⁸

96. Dr. Fairhurst stated that both the EDP photomontages preferred by Mr. McDonnell and the Visual Nature Studio simulations prepared by RDI described similar visibility overall as vegetation is minimal in height and distribution. He stated that wind turbines would be easily seen in near and further distances regardless of intervening fence posts, power poles and farm structures. Dr. Fairhurst pointed out that the only existing sizeable structures in the area are transmission towers, which he estimated to be less than 50 metres in height. Dr. Fairhurst stressed that unlike turbines, transmission towers are static and without movement.

97. RDI also prepared various day and night photomontages and animations using windPRO. Dr. Fairhurst explained that the animations showed the effect of turbine rotation, and included nighttime effects with aviation lights turned on. Dr. Fairhurst stated that with windPRO, he inserted the turbines into the photos for photo realism, which he said was "unfortunately" missing from the Visual Nature Studio simulations.⁶⁹

98. The Clearview Group took issue with accusations that Dr. Fairhurst was biased to the foreground in his simulations. The Clearview Group argued that in Dr. Fairhurst's observation points, only 38 per cent were foreground, which is not evidence of bias to the foreground. The Clearview Group further argued that the bias is attributable to Mr. McDonnell and EDP because WSP created visual simulations which clearly downplayed the visual impact of the project by only presenting midground and background views to members of the public.

99. The Clearview Group argued that:

Mr. McDonnell said you should only consider views from residences. Dr. Fairhurst, while he was very polite, I'm going to be less so, I think he basically said that's ridiculous. Members of the local community travel on these roadways every day and they

⁶⁸ Exhibit 22665-X0287, Clearview Group Opening Statement of Ken Fairhurst, page 4.

⁶⁹ Transcript, Volume 5, page 1066, lines 5-8.

will be exposed to these foreground views every single day. And it is valid and appropriate to include those views in a visual impact assessment.⁷⁰

100. Dr. Fairhurst analyzed the locations of the turbines relative to roads and testified that:

I also created a 1-kilometre zone along roadways that had turbines near. So I found there were 18 road segments within the community, easy access roads, totalling 88 kilometres from which 64 of the 83 turbines would be situated within 1 kilometre.⁷¹

101. The Clearview Group submitted that it is valid and appropriate to include foreground views in a visual impact assessment.

102. The Clearview Group also took issue with Mr. McDonnell's statement that turbines can animate an otherwise static environment with their moving blades. Dr. Fairhurst stated that this seemed contrived. He added that "the passive, cultivated integrity of the Sharp Hills landscape needs no enhancement of movement from incompatible turbines."⁷²

103. RDI found that the turbines would tower over the low-rolling landscape and most structures and vegetation, except where they are greater than five to eight kilometres away. Dr. Fairhurst stated that the exact distance was not tested by RDI, but a recent United States Bureau of Land Management study found that this zone may conservatively be 16 kilometres in similar terrain in the western United States.⁷³ Dr. Fairhurst stated that visual impacts could be present at a distance of 40 kilometres in the midwest and west, based on another study.⁷⁴

104. RDI stated that it applied a structured, objective assessment technique to examine the project's visual effect on the local farming community. It identified this technique as a visual effects assessment which was derived from the Cumulative Environmental Management Association Visual Landscape System, developed by RDI. Dr. Fairhurst stated that a quantitative approach is a common procedure in many countries for assessment of the visual impact of wind farms, serving both planners and regulators, and minimizing preferential subjectivity.

105. RDI's visual effects assessment included the use of a Visual Landscape System Rating Form, which Dr. Fairhurst explained was adapted by RDI for assessment of wind farms. Using this form, Dr. Fairhurst determined that the existing landscape integrity for the area is high, based on landscape attraction and observability. He explained that this resulted in a high landscape significance rating, and that the project would cause the existing landscape integrity to drop to low or very low in foreground views. He stated that this meant that intensive alteration is evident, very or extremely dominant, and of low or very low landscape conformity. Dr. Fairhurst explained that the default objective for landscape integrity is high, and that alterations should be subordinate, well-designed and have high landscape conformity. Dr. Fairhurst concluded that the project would largely be in direct conflict with the recommended landscape objective, particularly in the foreground views.

⁷⁰ Transcript, Volume 5, page 1234, lines 6-13.

⁷¹ Transcript, Volume 5, page 1078, lines 18-22.

⁷² Transcript, Volume 5, page 1093, lines 2-11.

⁷³ Exhibit 22665-X0254, Exhibit 254 - Art. Wind Turbine Visibility & Visual Impact Threshold Distances in Western Landscape, page 4.

⁷⁴ Exhibit 22665-X0254, Exhibit 254 - Art. Wind Turbine Visibility & Visual Impact Threshold Distances in Western Landscape, page 12.

106. The Clearview Group argued that Mr. McDonnell did not even critique Dr. Fairhurst's assessment, and only critiqued RDI's simulations. The Clearview Group submitted that Mr. McDonnell does not do visual impact assessments and is not a visual impact assessment practitioner, but by contrast, Dr. Fairhurst is a leading and an established visual impact assessment practitioner.

107. The Clearview Group also argued that the project's unprecedentedly tall turbines cannot in any way be integrated into the landscape of the Sedalia and New Brigden areas. The Clearview Group concluded that:

The fact is these massive turbines will have a massive visual impact, and to pretend otherwise is delusional and, I would submit, worse. It's just willful blindness.⁷⁵

5.4 Commission findings

108. The Commission acknowledges that the project's turbines are the tallest turbines currently applied-for or constructed in Alberta. However, the Commission views the height of the turbines proposed in the project as a function of developing and evolving technology and recognizes that although the turbines are taller, the project requires fewer turbines, given their size and capacity. Accordingly, this may increase the visual impact of a project on a per-turbine basis while decreasing the visual impact of the project overall. The Commission has taken this potential trade-off into account when weighing the visual impact of this project.

109. Dr. Fairhurst proposed a set of objective criteria for assessing the visual impact of the project. While the Commission considers that the concept of using objective criteria may be helpful in attempting to determine and evaluate visual impact, Dr. Fairhurst acknowledged that his criteria was "borrowed from existing systems in BC, the US, Alberta, [a BC] guidebook, and the UK",⁷⁶ and were "an assimilation of these approaches to make a workable assessment process [...]".⁷⁷ Further, Dr. Fairhurst stated that "[t]he Visual Landscape System Rating Form [was] adapted by RDI for wind farm application [...]"⁷⁸ and that "this is just the first go at using it for wind -- wind farms [...]".⁷⁹ The Commission considers that the objective criteria proposed by Dr. Fairhurst is not industry standard for wind projects and because it is untested, is of limited use in assessing the visual impacts of the project.

110. Applying objective criteria to visual impact may be of some use, particularly when comparing alternatives. However, the Commission considers that the assessment of visual impact is ultimately subjective in nature, and agrees with Ms. Blair's statement that "[t]here is no study out there that can tell me what I should and shouldn't like when it comes to visual impact."⁸⁰ The Commission understands that the criteria proposed by Dr. Fairhurst provides an objective framework for assessing the visual impact caused by the proposed project, but that Dr. Fairhurst's objective criteria may be different than the objective criteria of another party.

111. The Commission also finds that the visual simulations completed by WSP were more helpful for visualizing the project than Dr. Fairhurst's Visual Nature Studio generated

⁷⁵ Transcript, Volume 5, page 1235, lines 10-13.

⁷⁶ Transcript, Volume 5, page 1162, lines 16-8.

⁷⁷ Transcript, Volume 5, page 1163, lines 24-25.

⁷⁸ Transcript, Volume 5, page 1096, line 22.

⁷⁹ Transcript, Volume 5, pages 1083-1084, lines 25-1.

⁸⁰ Transcript, Volume 3, page 674, lines 11-13.

simulations. Dr. Fairhurst's Visual Nature Studio generated simulations did not provide photo realistic detail and were not convincing renderings of what the project may look like. Dr. Fairhurst's Visual Nature Studio generated simulations also lacked accurate depictions of landscape features and were flawed because they did not include items like distribution poles, fences and grain bins. However, Dr. Fairhurst's windPRO simulations, including the animations, were somewhat helpful in assessing the project's visual impact because they provided photo-realistic detail.

112. With respect to the viewpoints from which the visual simulations were completed, the Commission considers that it is important and beneficial to simulate visual impacts at residences, as they are more consistent and permanent viewpoints than the views from roads in the area. That said, the Commission does not consider that residences should be the only point from which visual impacts are simulated for the purposes of providing the public with information on the expected visual impacts of a project. Area roads should also be used as viewpoints for the purposes of visual simulations.

113. The Commission acknowledges that certain measures promised to be undertaken by EDP would lessen the project's visual impacts, such as locating the project's substation near an existing transmission line and locating the collector system lines underground to the extent allowable by engineering constraints and the Special Areas Board. The Commission notes that EDP has committed to minimizing the number of lights required on the wind turbines and using the minimum number of synchronized flashes per minute and the minimum flash duration, to the extent allowable by Transport Canada.

114. Taking into account the various subjective and objective measures presented to it, and with a view to the evidence presented by Dr. Fairhurst and Mr. McDonnell, the Commission finds that the proposed project's turbines would dramatically change the visual landscape of the project area. The Commission considers that the introduction of large, animated objects into this rural landscape would have a significant visual impact on the area.

115. With respect to the matter of whether a wind farm would be an acceptable alteration to the landscape or the viewscape in the area proposed by EDP, the Commission notes Dr. Fairhurst's statement that, "[...] it's an acceptable alteration in a place that has already been zoned and there is preparation for it to be there."⁸¹ The evidence before the Commission is that the project is being considered through the Special Areas Board Land Use Order application process, which contemplates that a wind project will be considered in accordance with viewscape requirements set out in that order.⁸² Based on its review of the Special Areas Board Land Use Order filed by the Clearview Group, the Commission notes that the applicable land use requirements for the area, as set out in that order, specifically include provisions regarding the construction of wind energy facilities. The Commission notes that the Special Areas Board Land Use Order contemplates that a wind power project may be an acceptable alteration to the viewscape of the area. Regardless, this is only one factor for the Commission to consider in its assessment of visual impact.

⁸¹ Transcript, Volume 5, page 1165, lines 5-9.

⁸² Exhibit 22665-X0145, Tab 13 - Schedule C to Ministerial Order No. MSL 007 15 Amendment to Special Areas Land Use Order.

116. Overall, the Commission is not convinced that the visual impact that would be caused by the project is prohibitive in and of itself. Nonetheless, it is one of the factors the Commission has considered when making its overall public interest determination for the project.

6 Environment

117. EDP retained Tetra Tech EBA Inc. (Tetra Tech) to prepare Phase 1 and Phase 2 environmental evaluation reports for the project (the EE Reports).⁸³ EDP also retained EcoLogic Consultants Ltd. (EcoLogic) to prepare evidence about the effects of the project on waterfowl.⁸⁴ Mr. Jon VanDerZee from EDP Renewables Canada Ltd., Dr. Troy Whidden from Tetra Tech and Dr. Jason Jones from EcoLogic testified at the hearing on behalf of EDP. EDP also filed AEP Wildlife Management renewable energy referral reports which were conducted as the project evolved (the referral reports),⁸⁵ including a 2016 referral report⁸⁶ for the project's initial Phase 1 buildable area application, and a 2017 referral report for the Phase 2 buildable area project layout consisting of 102 turbine locations, which was later amended to the final project layout consisting of 83 turbines.⁸⁷

118. The Clearview Group retained Mr. Cliff Wallis, a professional biologist with Cottonwood Consultants Ltd., to file evidence and testify on its behalf on environmental matters. Mr. Wallis filed a report detailing the project's environmental impacts and potential mitigations.⁸⁸ The Clearview Group also retained Dr. Scott Petrie of Delta Waterfowl Foundation (Delta Waterfowl) to file evidence and testify on the project's potential effects on waterfowl. Dr. Petrie filed a report outlining the potential impacts of the project on waterfowl.⁸⁹ Clearview Group members also testified at the hearing about their environmental concerns with the project.

119. The Clearview Group raised concerns with the environmental studies conducted for the project and with AEP's referral report process, submitting that the review process for renewable energy projects in the province is flawed. Accordingly, in the sections that follow, the Commission will discuss its consideration of the referral reports for the project in view of the concerns raised by the Clearview Group, and will then proceed to discuss the project's environmental effects.

⁸³ Exhibit 22665-X0007, Attachment 9 - Environmental Evaluation; Exhibit 22665-X0058, Attachment 7 - Environmental Evaluation; Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation.

⁸⁴ Exhibit 22665-X0220, Appendix D - Environment - Petrie and Chouindard - SHWF Reply Evidence - EcoLogic.

⁸⁵ Exhibit 22665-X0005, Attachment 6 - AEP Referral Report; Exhibit 22665-X0056.02, Attachment 5 - Alberta Environment and Parks Referral Report.

⁸⁶ Exhibit Exhibit 22665-X0005, Attachment 6 - AEP Referral Report.

⁸⁷ Exhibit 22665-X0056.02, Attachment 5 - Alberta Environment and Parks Referral Report.

⁸⁸ Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project.

⁸⁹ Exhibit 22665-X0139, Tab 19 - Evidence of Scott Petrie dated April 12, 2018 re the Impacts of the Project on Waterfowl.

6.1 Treatment of the referral reports

6.1.1 Views of EDP

120. EDP stated that throughout the project's planning and siting stages, it consulted with AEP to ensure the overall project location and infrastructure layout is adequate to accommodate environmental sensitivities.

121. EDP noted in its application that it conducted a number of wildlife surveys in co-ordination with AEP throughout 2016. EDP then finalized the Phase 1 environmental evaluation which detailed the results of those surveys (the EE Report for Phase 1) and provided it to AEP. After review of those documents, in December 2016 AEP issued an initial referral report for the purposes of the Phase 1 application (the 2016 referral report), which set out additional surveys that would be needed before EDP submitted a Phase 2 application.

122. EDP completed the surveys contemplated in the 2016 referral report, in preparation for submitting its Phase 2 application. EDP co-ordinated the survey methodology with AEP and completed the additional surveys during the spring and summer of 2017.⁹⁰

123. EDP finalized its Phase 2 environmental evaluation (the EE Report for Phase 2) and its Post-Construction Fatality Monitoring and Adaptive Management Plan (PCM Plan), which reflected the initial Phase 2 project layout of 102 turbines. EDP submitted those documents to AEP for review in the summer of 2017. AEP reviewed those documents and provided a second referral report at the end of August 2017 (the 2017 referral report).⁹¹ The 2017 referral report concluded that the project posed a low to moderate risk to wildlife and wildlife habitat, which was based on the Phase 2 buildable area application consisting of 102 potential turbine locations.

124. In December 2017, EDP provided an addendum to its Phase 2 buildable area application to AEP identifying the reduced environmental impacts from changing the project layout to 83 turbines.⁹² In response, AEP confirmed by email:

AEP has no additional concerns regarding risk to wildlife or wildlife habitat, given that the number of turbines have been reduced from 102 to 83 and related infrastructure footprint impacts to native grassland and wetland habitats have also been reduced. I can confirm that the Sharp Hills Wind Power Project remains a low to moderate risk to wildlife and wildlife habitat, based on the current project layout, as I reported in my Referral Report dated August 30, 2017.⁹³

125. Mr. VanDerZee explained that "we believe our requirement is to consult extensively with Alberta Environment and Parks, which we've done over the last two and a half years, including presenting and confirming our study plans with AEP."⁹⁴ EDP also pointed out that AEP affirmed conclusions reached in its referral reports when it responded to a letter from the Clearview Group; AEP stated, amongst other things, that "[w]ildlife assessments were undertaken by professional experienced biologists according to AEP policy" and that it

⁹⁰ Exhibit 22665-X0069.02, EDPR Sharp Hills AUC Phase 2 Application 08SEP2017, pages 24-25.

⁹¹ Exhibit 22665-X0069.02, EDPR Sharp Hills AUC Phase 2 Application 08SEP2017, pages 24-25.

⁹² Exhibit 22665-X0069.02, EDPR Sharp Hills AUC Phase 2 Application 08SEP2017, pages 24-25.

⁹³ Exhibit 22665-X0056.02, Attachment 5 - Alberta Environment and Parks Referral Report, page 14.

⁹⁴ Transcript, Volume 2, page 300, lines 11-15.

“evaluated the proposed surveys for alignment with the *Wildlife Directive for Wind Energy Projects (2017)*.”⁹⁵

126. EDP stated that the referral report application process is prescribed by Rule 007 and AEP’s 2017 *Wildlife Directive for Alberta Wind Energy Projects*, and has been confirmed in the roles and responsibilities document released in AUC Bulletin 2018-04 (roles and responsibilities document).⁹⁶ EDP submitted that the Clearview Group’s concerns with the referral report process are outside the scope of this proceeding.

6.1.2 Views of the Clearview Group

127. The Clearview Group took issue with the scope of the project’s environmental studies and the referral report process, arguing that there is a fundamental problem with the way the environmental effects of wind projects are assessed in Alberta⁹⁷ and the system is flawed. The Clearview Group stated there was a lack of independent, objective, third-party environmental study on the impacts of turbines of the size proposed.

128. The Clearview Group explained that the environmental effects of the project have been assessed by a consultant hired by EDP, and AEP conducts only desktop reviews of those reports. On February 16, 2018, the Clearview Group wrote to AEP with questions about the referral reports. The Clearview Group noted that in AEP’s responses, AEP confirmed that its assessment was limited to reviewing the information prepared by EDP’s consultant.⁹⁸ The Clearview Group raised concerns that no independent on-site assessment was carried out and no input was sought from local residents and landowners.

129. The Clearview Group also took issue with AEP advising that it would not be attending the hearing to answer questions about the referral reports. The Clearview Group noted that the roles and responsibilities document expressly provides that AEP may testify at a hearing. The Clearview Group argued that it is impossible for an intervener to meaningfully challenge or test those referral reports in the absence of any witnesses from AEP.

130. The Clearview Group stated that the test that the Commission must apply is not whether AEP has provided a referral report, but whether the project is in the public interest, having regard to its environmental effects.

6.1.3 Commission findings

131. AEP is responsible for the overall management and regulation of wildlife in Alberta, and the Commission is responsible for approving the construction and operation of wind power plants under the *Hydro and Electric Energy Act* and the *Alberta Utilities Commission Act*. As explained above, Section 17 of the *Alberta Utilities Commission Act* requires the Commission to consider whether the project is in the public interest, having regard to its social and economic effects, and its effects on the environment.

132. In making its public interest determination, the Commission has included the referral reports provided by AEP, as well as the evidence filed by EDP and the Clearview Group, as part

⁹⁵ Exhibit 22665-X0143, Tab 15 - AEP Response to Letter dated February 16 2018-to Mr. Gavin S. Fitch, page 2.

⁹⁶ Exhibit 22665-X0280, Aid to Cross Examination.

⁹⁷ Transcript, Volume 5, page 1236, lines 4-6.

⁹⁸ Exhibit 22665-X0143, Tab 15 - AEP Response to Letter dated February 16 2018-to Mr. Gavin S. Fitch, page 2.

of its overall consideration of the applications. If the Commission is satisfied that the proposed project is in the public interest, having regard to, amongst other things, the project's environmental effects, it will approve the project and may do so subject to any conditions it determines necessary in the circumstances.

133. The Commission disagrees with the Clearview Group that the environmental review process for wind projects in Alberta is fundamentally flawed. The Commission emphasizes that a referral report provided by AEP represents a single step in a long, collaborative process that is guided by AEP. In this case, the record reflects the considerable correspondence and communication between AEP and EDP through which the necessary surveys, and the methodologies for those surveys, were determined. The record is clear that EDP consistently sought advice from AEP on most aspects of its environmental evaluation and that advice was provided. AEP reviewed EDP's survey plans and provided review, feedback and guidance with a view to assisting EDP to establish an assessment and mitigation plan satisfactory to AEP. A significant amount of correspondence was filed by EDP as attachments to the referral reports and in response to an information request from the Clearview Group, as evidence of this process.⁹⁹ AEP then provided its assessment of the environmental evaluation conducted in the form of the two referral reports.

134. Further, AEP's involvement in a project does not end once it issues its referral report. Rather, AEP has an ongoing oversight role for projects as an applicant moves through construction and operation, including an applicant's consultation with AEP with respect to post-construction monitoring and mitigation plans.

135. As noted previously, the AUC's predecessor, the Alberta Energy and Utilities Board, commented on the relationship between existing regulatory standards and its assessment of the public interest in Decision 2001-111:

The determination of whether a project is in the public interest requires the Board to assess and balance the negative and beneficial impacts of the specific project before it. Benefits to the public as well as negative impacts on the public must be acknowledged in this analysis. The existence of regulatory standards and guidelines and a proponent's adherence to these standards are important elements in deciding whether potential adverse impacts are acceptable. [...]

In the Board's view, the public interest will be largely met if applications are shown to be in compliance with existing provincial health, environmental, and other regulatory standards in addition to the public benefits outweighing negative impacts.¹⁰⁰

136. When assessing the environmental impacts of the proposed project, the Commission will take into account EDP's adherence to AEP's 2017 *Wildlife Directive for Alberta Wind Energy Projects* and other related AEP guidelines or standards, as well as AEP's assessment of the project's environmental impacts as reflected in the referral report. In the Commission's view, the information provided in referral reports is valuable because it comes from independent wildlife professionals with experience assessing the environmental impacts of wind projects in Alberta.

⁹⁹ Exhibit 22665-X0120, Attachment CVIR1-024-01 - AEP Correspondence Part 1 of 2; Exhibit 22665-X0121, Attachment CVIR1-024-01 - AEP Correspondence Part 2 of 2.

¹⁰⁰ Decision 2001-111: EPCOR Generation Inc. and EPCOR Power Development Corporation – 490 - MW Genesee Power Plant Expansion, Application 2001173, December 21, 2001, page 11.

In the Commission's view, a relevant factor when assessing the information included in a referral report is the independent, neutral source of the information itself.

137. However, as noted above, when determining the environmental effects of a proposed wind energy project, and deciding if those effects can be effectively mitigated, the Commission does not restrict its consideration to the referral report. Rather, the Commission has regard for the filed evidence of applicants and interveners and any direct evidence provided in an oral hearing. In this proceeding, the Commission is called upon to weigh the referral reports, the environmental reports provided by Tetra Tech and other evidence submitted by EDP, as well as the evidence submitted by the Clearview Group, Cottonwood Consultants Ltd., and Delta Waterfowl, including AEP's responses to questions from the Clearview Group. The Commission weighs this information in its entirety when deciding if a project is in the public interest.

138. As noted above, the Clearview Group stated that the test that the Commission must apply is not whether AEP has provided a referral report, but whether the project is in the public interest, having regard to its environmental effects. The Commission agrees with the Clearview Group that this is the applicable test, and will make this determination by weighing all of the evidence before it.

6.2 Environmental effects

6.2.1 Views of EDP

6.2.1.1 General environmental effects and mitigation

139. EDP prepared EE Reports for the project that set out the environmental components present in the project area, and prepared a draft Construction and Operation Mitigation Plan for the project.¹⁰¹ The EE Reports discussed and predicted the project's effects on the environment, and measures to avoid or mitigate the project's predicted adverse environmental effects and any monitoring proposed to evaluate the efficacy of those measures. The EE Reports were completed using desktop and field-based studies conducted on various environmental components throughout 2016 and 2017. The EE Reports set out the predicted residual adverse effects (i.e., effects following implementation of the proposed mitigation) of the project and their significance. Criteria used in the EE Reports to evaluate the significance of the residual effects were: magnitude, geographic extent, duration, frequency, likelihood and reversibility. Certain combinations of these criteria could lead to a determination of a "significant" residual effect determination, but Tetra Tech assessed that none of these combinations were true for the project. The EE Reports predicted that, with implementation of the proposed mitigation measures, the magnitude of the residual effects for all the environmental components ranged from low to moderate and the residual effects are "not significant".¹⁰²

140. With respect to the general siting of the project, approximately 10.7 per cent of the construction phase project footprint would be sited within Environmentally Significant Areas (ESAs)¹⁰³ which, as submitted by Tetra Tech, are intended to inform land use planning rather

¹⁰¹ Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, Appendix D, Construction and Operation Mitigation Plan.

¹⁰² Exhibit 22665-X0007, Attachment 9 - Environmental Evaluation, pages 69-71, Table 27; Exhibit 22665-X0058, Attachment 7 - Environmental Evaluation, pages 46-48, Table 14.

¹⁰³ Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, Supplemental Environmental Evaluation Addendum Revision 3, page 201, Table 5.

than restrict development.¹⁰⁴ EDP explained that it used the ESA data as intended, as part of the project's pre-construction siting and planning stages.¹⁰⁵

141. With respect to wetlands in the project area, based on a desktop review Tetra Tech identified that approximately 3.9 per cent of the construction phase footprint is classified as wetland cover, including six hectares of Class 3 wetlands, six hectares of Class 4 wetlands, and less than one hectare of Class 5 wetlands.¹⁰⁶ It was Tetra Tech's evidence that the permanent operational phase footprint on wetlands would be one hectare.¹⁰⁷ Tetra Tech submitted that the project has reduced wetland impacts to the extent feasible while giving consideration to other constraints.¹⁰⁸

142. Tetra Tech indicated that 36 per cent of the project's construction phase footprint would be sited within AEP's recommended 100-metre setback from Class 3 to Class 5 wetlands,¹⁰⁹ but 43 per cent of those incursions would result from installing underground collector lines, which would have no impacts to wetlands following construction.¹¹⁰ None of the project's turbines would be sited within 100 metres of any Class 4 or Class 5 wetlands.¹¹¹

143. Tetra Tech stated that AEP's recommended 100-metre minimum setback from Class 3 to Class 5 wetlands is not always relevant depending on the functional value of the wetland and the land use surrounding it, and therefore, through site investigation and in consultation with AEP, a smaller, more appropriate buffer for a particular wetland can be determined.¹¹² Tetra Tech explained that AEP has the discretion to consider and accept relaxations of wetland setbacks on a case-by-case basis¹¹³ and that AEP has confirmed that relaxations of minimum setbacks from certain wetlands is unlikely to result in harm.¹¹⁴

144. Tetra Tech stated that avoidance of Class 3 to Class 5 wetlands was the primary wetland mitigation employed for the project.¹¹⁵ While EDP was unsure whether construction would result in any direct disturbance of wetlands,¹¹⁶ EDP stated it would prepare a Wetland Assessment and Impact Report and Mitigation Proposal in support of obtaining approvals for any direct wetland disturbance under the provincial *Water Act* and *Public Lands Act*.¹¹⁷ EDP stated that it would undertake to further reduce the project's impacts to wetlands through micro-siting of project

¹⁰⁴ Exhibit 22665-X0203, Appendix C - Environment - Wallis - SHWF Reply Evidence - TetraTech EcoLogic, page 3.

¹⁰⁵ Exhibit 22665-X0203, Appendix C - Environment - Wallis - SHWF Reply Evidence - TetraTech EcoLogic, pages 3 and 6.

¹⁰⁶ Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, Supplemental Environmental Evaluation Addendum Revision 3, page 199, Table 3.

¹⁰⁷ Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, Supplemental Environmental Evaluation Addendum Revision 3, page 199, Table 3.

¹⁰⁸ Transcript, Volume 2, pages 354-355, lines 6-10; Exhibit 22665-X0203, Appendix C - Environment - Wallis - SHWF Reply Evidence - TetraTech EcoLogic, pages 3 and 7.

¹⁰⁹ Transcript, Volume 2, page 357, lines 5-20; Transcript, Volume 2, pages 360-361, lines 21-11.

¹¹⁰ Exhibit 22665-X0203, Appendix C - Environment - Wallis - SHWF Reply Evidence - TetraTech EcoLogic, page 10, Table 1.

¹¹¹ Exhibit 22665-X0203, Appendix C - Environment - Wallis - SHWF Reply Evidence - TetraTech EcoLogic, page 11.

¹¹² Transcript, Volume 2, page 366-367, lines 10-16.

¹¹³ Transcript, Volume 5, page 1198, lines 1-10.

¹¹⁴ Transcript, Volume 2, page 367, lines 12-16.

¹¹⁵ Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, page 24.

¹¹⁶ Transcript, Volume 2, page 350, lines 7-11; Transcript, Volume 5, page 1198, lines 20-23.

¹¹⁷ Exhibit 22665-X0096.01, Proceeding 22665_IR2 Response 20OCT2017, EDP-AUC-2017OCT04-008, page 18.

infrastructure (which refers to the fact that PP14 of Rule 007 provides that, if approval for the project is granted, an applicant may relocate a turbine up to 50 metres from the applied-for location without reapplying to the Commission for approval of that change¹¹⁸) during the detailed engineering phase of the project.¹¹⁹ EDP also proposed several other mitigations to reduce the project's effects on wetlands.¹²⁰

145. In addition, Tetra Tech stated that all watercourse crossings would be constructed in accordance with the *Code of Practice for Watercourse Crossings*.¹²¹ EDP did not anticipate any effects to groundwater resources from the project because bedrock is not located near the ground surface in the project area and EDP has never experienced groundwater issues with its other wind projects.¹²² Finally, all construction activities would be managed to prevent the introduction and spread of noxious and prohibited noxious weeds in accordance with the Alberta *Weed Control Act*.¹²³

146. EDP emphasized that it would continue to consult and co-ordinate with AEP throughout the project's construction phase on appropriate pre-construction environmental assessments, its post-construction monitoring plan, and adaptive management strategies.¹²⁴

147. With respect to decommissioning and reclamation activities, EDP committed to reclaim the project footprint, and confirmed that it would complete all decommissioning and reclamation activities in accordance with industry standard practice at the relevant time. EDP indicated that pursuant to the *Renewable Electricity Act*¹²⁵ and the *Environmental Protection and Enhancement Act*,¹²⁶ EDP is statutorily required to obtain a reclamation certificate from AEP in accordance with the *Conservation and Reclamation Regulation*¹²⁷ when the project is decommissioned. EDP also committed to developing a decommissioning plan which would be submitted to the Special Areas Board as part of its application for a Special Areas Board development permit.

148. Regarding financial responsibility for decommissioning activities, EDP indicated that it is responsible for the costs of decommissioning and abandonment and confirmed that, regardless of the corporate entity that holds the approval, EDP's parent corporation, which has considerable balance sheet strength, is ultimately financially responsible for reclamation at the project's end of life. EDP also submitted that it is reasonable to assume that some portion of reclamation costs could be covered by the project's salvage value.

149. EDP noted that it has committed to establishing a decommissioning fund relative to all properties on which project turbines are located. EDP explained that this commitment is codified in its lease agreements with participating landowners and payments would begin to go into the

¹¹⁸ Rule 007: *Applications for Power Plants, Substations, Transmission Lines, Industrial System Designations and Hydro Developments*, page 12, item PP14.

¹¹⁹ Exhibit 22665-X0203, Appendix C - Environment - Wallis - SHWF Reply Evidence - TetraTech EcoLogic, page 8.

¹²⁰ Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, pages 24-25; Exhibit 22665-X0203, Appendix C - Environment - Wallis - SHWF Reply Evidence - TetraTech EcoLogic, page 8.

¹²¹ Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, page 25.

¹²² Transcript, Volume 2, pages 475-477, lines 12-3.

¹²³ Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, pages 29-30.

¹²⁴ Transcript, Volume 3, page 568, lines 1-19.

¹²⁵ SA 2016, c R-16.5.

¹²⁶ RSA 2000, c E-12.

¹²⁷ Alta Reg 115/1993.

fund starting 15 years after the project is commissioned. EDP argued that this fund would provide additional comfort to participating landowners that funds would be available at the end of the project's operating life for decommissioning and abandonment costs. EDP argued that this practice goes beyond industry standards worldwide, and serves as an additional layer of protection to ensure funds are available for decommissioning.

150. In response to the Clearview Group's concerns, EDP stressed that no wind turbines or project components would be located on any lands owned by members of the Clearview Group.

6.2.1.2 Native vegetation effects and mitigation

151. The project study area consists of privately owned land that is primarily cultivated (63.8 per cent).¹²⁸ The remaining land consists primarily of native grassland (17.1 per cent), wetland (12 per cent) and tame pasture (5.3 per cent).¹²⁹ The proposed construction footprint would include 27 hectares of disturbance to native grassland,¹³⁰ and the permanent operational footprint on native grassland would be less than one hectare.¹³¹ Tetra Tech submitted that the project has reduced native grassland impacts to the extent feasible while giving consideration to other constraints.¹³²

152. Two occurrences of the plains rough fescue grassland community, a rare ecological community with an Alberta Conservation Information and Management System (ACIMS) ranking of S1 (especially vulnerable to extirpation), were previously recorded in the project study area by the Government of Alberta.¹³³ Approximately five hectares (less than one per cent) of the construction phase footprint has the potential to encounter this rare grassland community,¹³⁴ and EDP acknowledged that some project infrastructure would likely intersect small portions of the plains rough fescue rare grassland vegetation community.¹³⁵

153. No ACIMS S1 or S2 (vulnerable to extirpation) ranked rare plants were recorded during the June 2017 rare vegetation surveys.¹³⁶ A late season rare plant survey was conducted on September 1, 2017, and no ACIMS ranked S1 or S2 plant species were discovered.¹³⁷ Several

¹²⁸ Exhibit 22665-X0007, Attachment 9 - Environmental Evaluation, pages 23-24, Table 11.

¹²⁹ Exhibit 22665-X0007, Attachment 9 - Environmental Evaluation, pages 23-24, Table 11.

¹³⁰ Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, Supplemental Environmental Evaluation Addendum Revision 3, Table 4; Exhibit 22665-X0289, Outstanding Undertakings, page 3; Exhibit 22665-X0096.01, Proceeding 22665_IR2 Response 20OCT2017, EDP-AUC-2017OCT04-005, pages 9-10.

¹³¹ Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, Supplemental Environmental Evaluation Addendum Revision 3, Table 4; Exhibit 22665-X0289, Outstanding Undertakings, page 3; Exhibit 22665-X0096.01, Proceeding 22665_IR2 Response 20OCT2017, EDP-AUC-2017OCT04-005, pages 9-10.

¹³² Exhibit 22665-X0203, Appendix C - Environment - Wallis - SHWF Reply Evidence - TetraTech EcoLogic, pages 3 and 12.

¹³³ Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, page 14 and Appendix B, Vegetation Elements of Management Concern known to occur in the Dry Mixedgrass and Northern Fescue Natural Subregions, pages 1 and 3.

¹³⁴ Exhibit 22665-X0203, Appendix C - Environment - Wallis - SHWF Reply Evidence - TetraTech EcoLogic, page 13; Transcript, Volume 3, page 542, lines 1-16.

¹³⁵ Exhibit 22665-X0129, SharpHills CVIR1 Response Document, EDP-CLEARVIEW GROUP-2018MAR12-023, page 35.

¹³⁶ Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, Appendix C, Vegetation species detected during the early season rare vascular plant survey, pages 1-3.

¹³⁷ Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, Supplemental Environmental Evaluation Addendum Revision 3, page 2; Exhibit 22665-X0096.01, Proceeding 22665_IR2 Response 20OCT2017, EDP-AUC-2017OCT04-008(c), page 19.

ACIMS S3 (somewhat vulnerable) ranked rare plants were observed during the June 2017 survey, including Hooker's sedge, and Tetra Tech recommended several mitigation measures to minimize the project's potential adverse effects on Hooker's sedge.¹³⁸

154. EDP stated that it would implement several mitigation measures to reduce effects on native vegetation and grassland communities, and that the project would employ a combination of horizontal directional drilling and narrow trenching when installing underground collector lines across native grassland.¹³⁹

155. Turbine 9 was proposed to be located on native grassland. In response to concerns raised by the Clearview Group concerning its effect on native grassland, EDP opposed Turbine 9's elimination because the area would have very high wind production.¹⁴⁰ EDP explained that Turbine 9's elimination is not warranted because the decision to site this turbine on native grassland was dictated by the Special Areas Board's property line and noise compliance setbacks, which resulted in the turbine being placed approximately 130 metres into a parcel with native grasslands.¹⁴¹ EDP noted that Turbine 9 would have associated infrastructure located on native grassland, and stated that it would co-locate some of that infrastructure, where possible, to further reduce native grassland disturbance.¹⁴² EDP committed to move portions of Turbine 9's construction workspace off native grassland and to attempt to micro-site Turbine 9 and its associated infrastructure, while taking into account other constraints, to further reduce native grassland disturbance.¹⁴³ EDP further committed to the following:

[EDP] will seek to reduce the spatial impacts to native grassland associated with [Turbine] 9 and associated infrastructure. Where complete avoidance of long-term impacts cannot be achieved at [Turbine] 9 and associated infrastructure, [EDP] will work with AEP to offset impacts by conserving native grassland elsewhere.¹⁴⁴

156. Where native grassland cannot be avoided and as a result is temporarily disturbed during construction, EDP would use a native seed mix to restore areas of native grassland to conditions equivalent to adjacent land conditions.¹⁴⁵ EDP further stated that it would restore areas of northern fescue back to the specific northern fescue community type.¹⁴⁶ However, Tetra Tech acknowledged that there is a degree of uncertainty with any type of reclamation and that pre-construction conditions may not be achievable. Tetra Tech also acknowledged that northern

¹³⁸ Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, Supplemental Environmental Evaluation Addendum Revision 3, pages 1-3.

¹³⁹ Exhibit 22665-X0203, Appendix C - Environment - Wallis - SHWF Reply Evidence - TetraTech EcoLogic, page 12.

¹⁴⁰ Transcript, Volume 3, page 616, lines 7-10.

¹⁴¹ Exhibit 22665-X0290, Reply Argument, page 6, paragraph 14; Transcript, Volume 2, page 374, lines 2-13; Transcript, Volume 3, pages 536-537, lines 1-14; Transcript, Volume 3, pages 615-616, lines 17-6; Transcript, Volume 5, page 1200, lines 18-20.

¹⁴² Transcript, Volume 3, page 534, lines 13-24; Transcript, Volume 5, pages 1199-1200, lines 22-3.

¹⁴³ Transcript, Volume 3, pages 536-537, lines 14-14; Transcript, Volume 3, page 616, lines 11-20; Exhibit 22665-X0290, Reply Argument, page 6, paragraph 15; Transcript, Volume 3, pages 616-617, lines 21-11; Transcript, Volume 5, page 1201, lines 9-13.

¹⁴⁴ Exhibit 22665-X0289, Outstanding Undertakings, page 6.

¹⁴⁵ Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, page 30 and Appendix D, Construction and Operation Mitigation Plan, page 5; Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, page 2.

¹⁴⁶ Transcript, Volume 3, page 543, lines 1-18.

fescue native grassland communities, particularly the plains rough fescue grassland vegetation community,¹⁴⁷ are difficult to restore.¹⁴⁸

157. EDP confirmed that it had not yet established reclamation goals and targets¹⁴⁹ and that it has yet to prepare a post-construction reclamation plan to meet the requirements of the Special Areas Board development permit approval.¹⁵⁰ EDP committed to, in consultation with AEP, prepare a more detailed post-construction reclamation and restoration plan containing specific criteria for determining success of native grassland restoration.¹⁵¹ EDP stated that this plan would be completed and approved by AEP prior to construction and would be an appropriate condition of project approval.¹⁵²

158. EDP initially committed to one year of monitoring soil health and vegetation establishment on native grassland areas being reclaimed following construction, with the possibility of a second year of monitoring at specific areas where problems are detected.¹⁵³ EDP acknowledged during the hearing that it has not specifically confirmed the sufficiency of one year of monitoring with AEP.¹⁵⁴

6.2.1.3 General wildlife effects and mitigation

159. As noted above, 17.1 per cent and 12 per cent of the project study area is comprised of native grassland and wetland, respectively.¹⁵⁵ The EE Reports set out the potential effects of the project on wildlife, including habitat loss or avoidance and turbine collisions, and proposed a number of mitigation measures to minimize project effects on wildlife and habitat.¹⁵⁶ The EE Reports indicated that, with implementation of the proposed mitigation, the magnitude of the residual effects for all wildlife species and habitat was low.¹⁵⁷

160. The initial round of surveys conducted in 2016 included sharp-tailed grouse lek surveys; spring and fall bird migration and raptor migration surveys, breeding bird surveys, burrowing owl surveys; and spring and fall bat activity acoustic surveys.¹⁵⁸ Tetra Tech conducted

¹⁴⁷ Transcript, Volume 3, pages 542-544, lines 21-11.

¹⁴⁸ Exhibit 22665-X0203, Appendix C - Environment - Wallis - SHWF Reply Evidence - TetraTech EcoLogic, page 15; Exhibit 22665-X0290, Reply Argument, page 6, paragraph 15; Transcript, Volume 2, pages 368-369, lines 10-12.

¹⁴⁹ Transcript, Volume 3, page 617, lines 13-24.

¹⁵⁰ Transcript, Volume 3, page 546-547, lines 24-14.

¹⁵¹ Exhibit 22665-X0289, Outstanding Undertakings, page 5; Exhibit 22665-X0290, Reply Argument, page 6, paragraph 15; Transcript, Volume 3, page 619, lines 15-21; Transcript, Volume 5, page 1201, lines 2-7.

¹⁵² Transcript, Volume 5, page 1201, lines 2-4; Transcript, Volume 3, page 620, lines 4-10.

¹⁵³ Exhibit 22665-X0096.01, Proceeding 22665_IR2 Response 20OCT2017, EDP-AUC-2017OCT04-005(e), pages 11-12; Transcript, Volume 3, page 544, lines 18-24.

¹⁵⁴ Transcript, Volume 3, page 545, lines 10-15.

¹⁵⁵ Exhibit 22665-X0007, Attachment 9 - Environmental Evaluation, pages 23 to 24, Table 11.

¹⁵⁶ Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, Appendix D, Construction and Operation Mitigation Plan, pages 5 to 10; Exhibit 22665-X0007, Attachment 9 - Environmental Evaluation, pages 59-60, 33-34, Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, Appendix E, Post-Construction Monitoring and Adaptive Management Plan; Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, Appendix D, Construction and Operation Mitigation Plan; Exhibit 22665-X0096.01, Proceeding 22665_IR2 Response 20OCT2017, EDP-AUC-2017OCT04-006(c), page 14; Exhibit 22665-X0289, Outstanding Undertakings, page 4; Exhibit 22665-X0096.01, Proceeding 22665_IR2 Response 20OCT2017, EDP-AUC-2017OCT04-006(a), page 13.

¹⁵⁷ Exhibit 22665-X0007, Attachment 9 - Environmental Evaluation, pages 69-71, Table 27; Exhibit 22665-X0058, Attachment 7 - Environmental Evaluation, pages 46-48, Table 14.

¹⁵⁸ Exhibit 22665-X0007, Attachment 9 - Environmental Evaluation, pages 45-47.

supplemental sharp-tailed grouse lek, raptor aerial stick nest, and amphibian acoustic surveys in 2017.¹⁵⁹ Tetra Tech stated that the wildlife survey data, types, methods, and extent of coverage was in accordance with the 2011 *Wildlife Guidelines for Alberta Wind Energy Projects*¹⁶⁰ and was also based on feedback received from AEP during project-specific consultation that took place between February 2016 and August 2017.¹⁶¹ Tetra Tech stated that nocturnal migrant bird surveys were unnecessary because turbine collision risk to nocturnal migrating passerines was low, even in locations with higher migration rates, and there is no statistically significant relationship between bird radar data and post-construction fatality rates.¹⁶²

161. The spring 2017 amphibian acoustic survey targeted species at risk with the potential to inhabit the study area, including northern leopard frog, Canadian toad, Great Plains toad and plains spadefoot toad.¹⁶³ Twelve sites were selected at large Class 3, 4, and 5 wetlands proximate to native prairie and within 100 metres of project infrastructure.¹⁶⁴ While no species at risk were detected during this survey, an abundance of boreal chorus frogs was detected at all 12 sites.¹⁶⁵

162. AEP's referral reports concluded that the project posed an overall low to moderate risk to wildlife and wildlife habitat.¹⁶⁶ AEP noted that most of the bird species of management concern detected during surveys were recorded in low numbers, with the exception of Sprague's pipit and red-tailed hawk, which would both have flight patterns within the project's rotor sweep area.¹⁶⁷

Birds

163. AEP's referral reports considered the risk to passerines as moderate having considered the presence of sensitive species, including some species that may be at risk of turbine collisions.¹⁶⁸ Waterfowl and passerines were the most common bird species groups detected in the project's wildlife study area, and several bird species at risk and habitat features were detected, during the 2016 wildlife surveys.¹⁶⁹

164. EDP stated that the project's three proposed meteorological towers would be sited on cultivated lands, not near any concentrated bird foraging areas, and at least 230 metres from any Class 4 and Class 5 wetlands. According to EDP, AEP reviewed the locations of the proposed meteorological towers and did not raise any concerns.¹⁷⁰ EDP and Tetra Tech submitted that the potential mortality impacts of the meteorological towers on birds during operation would be not

¹⁵⁹ Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, pages 15-16.

¹⁶⁰ Exhibit 22665-X0203, Appendix C - Environment - Wallis - SHWF Reply Evidence - TetraTech EcoLogic, page 4.

¹⁶¹ Exhibit 22665-X0203, Appendix C - Environment - Wallis - SHWF Reply Evidence - TetraTech EcoLogic, pages 4-5.

¹⁶² Exhibit 22665-X0203, Appendix C - Environment - Wallis - SHWF Reply Evidence - TetraTech EcoLogic, pages 4 and 16.

¹⁶³ Exhibit 22665-X0120, Attachment CVIR1-024-01 - AEP Correspondence Part 1 of 2, page 152.

¹⁶⁴ Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, page 15.

¹⁶⁵ Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, page 16.

¹⁶⁶ Exhibit 22665-X0056.02, Attachment 5 - Alberta Environment and Parks Referral Report, page 3.

¹⁶⁷ Exhibit 22665-X0056.02, Attachment 5 - Alberta Environment and Parks Referral Report, page 10.

¹⁶⁸ Exhibit 22665-X0056.02, Attachment 5 - Alberta Environment and Parks Referral Report, page 10.

¹⁶⁹ Exhibit 22665-X0007, Attachment 9 - Environmental Evaluation, page 29.

¹⁷⁰ Exhibit 22665-X0106, Information Response #3, Response to EDP-AUC-2017DEC21-002(b), page 7.

significant due to the lack of concentrated bird migration patterns in the buildable area and given that EDP will avoid the use of guy wires.¹⁷¹

165. Tetra Tech stated that there have been no documented large fatality events of passerines at turbines. It explained that any large fatality events that have been documented occurred at buildings and at tall, guyed communication towers that were almost exclusively associated with the use of bright, steady lights and poor weather. EDP stated that the project would avoid the use of guy wires and steady lights.¹⁷²

166. EDP committed to minimizing the use of above-ground collector lines, which pose a collision risk to birds, except in situations where EDP could reduce new vegetation disturbance and habitat fragmentation by paralleling existing public road rights-of-way.¹⁷³ EDP committed to designing any above-ground lines to reduce bird collisions and to install bird markers on those lines.¹⁷⁴

167. Dr. Jones critically reviewed the literature cited by Delta Waterfowl and, for each paper cited, explained in detail why he was of the opinion that this literature did not support Delta Waterfowl's assessment of risk posed to waterfowl by the project.¹⁷⁵ Dr. Jones opined that, based on his experience, there is no generalized barrier effect associated with waterfowl and industrial wind projects in North America.¹⁷⁶ He explained that while waterfowl may exhibit avoidance or displacement behaviour around individual moving turbines, it does not constitute evidence that waterfowl would avoid an entire wind project area.¹⁷⁷

168. While Dr. Jones acknowledged that construction and operation of the project may result in some waterfowl displacement, individual birds are unlikely to be displaced to a distance that affects individual survival or regional population levels¹⁷⁸ due to the close proximity of wetlands similar to those in the project area, the large spacing between turbines that would allow for waterfowl to maneuver through the project area, and the relative infrequency with which waterfowl collide with turbines in North America.¹⁷⁹ Dr. Jones stated that he was unable to find documented evidence of a positive correlation between turbine size and waterfowl avoidance or displacement behaviour.¹⁸⁰ He concluded that Delta Waterfowl's calculations of avoidance and

¹⁷¹ Exhibit 22665-X0106, Information Response #3, EDP-AUC-2017DEC21-002(d) and 002(f), pages 8-9.

¹⁷² Exhibit 22665-X0203, Appendix C - Environment - Wallis - SHWF Reply Evidence - TetraTech EcoLogic, pages 16-17.

¹⁷³ Transcript, Volume 2, pages 478-479, lines 17-20; Transcript, Volume 2, page 483, lines 1-10.

¹⁷⁴ Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, Appendix D, Construction and Operation Mitigation Plan, page 6; Exhibit 22665-X0022, Sharp Hills Wind Farm IR1 Response, EDP-AUC-2017JUN13-001(b), pages 2-3; Exhibit 22665-X0289, Outstanding Undertakings, page 4; Transcript, Volume 2, pages 481-482, lines 8-8.

¹⁷⁵ Exhibit 22665-X0220, Appendix D - Environment - Petrie and Chouindard - SHWF Reply Evidence - EcoLogic, pages 3-8.

¹⁷⁶ Transcript, Volume 2, page 381, lines 8-12; Transcript, Volume 2, page 382, lines 3-5; Transcript, Volume 2, page 395, lines 1-5.

¹⁷⁷ Transcript, Volume 2, page 385-386, lines 3-16.

¹⁷⁸ Exhibit 22665-X0220, Appendix D - Environment - Petrie and Chouindard - SHWF Reply Evidence - EcoLogic, page 9.

¹⁷⁹ Exhibit 22665-X0220, Appendix D - Environment - Petrie and Chouindard - SHWF Reply Evidence - EcoLogic, page 9.

¹⁸⁰ Transcript, Volume 2, page 388, lines 6-17.

exclusion zones, and hence its prediction of extensive effects of the project on local waterfowl populations, is not supported by its evidence or arguments.¹⁸¹

169. The referral reports considered the project's risk to raptors as moderate due to the presence of sensitive species including some species that may be at risk of collisions with turbines.¹⁸² Raptor species at risk that were observed during 2016 surveys included American kestrel, ferruginous hawk, golden eagle, northern harrier, Swainson's hawk, and peregrine falcon.¹⁸³ Other raptor species at risk that potentially occur in the project area include osprey and prairie falcon.¹⁸⁴ Three active ferruginous hawk nests, three active Swainson's hawk nests, six active red-tailed hawk nests, and one active unidentified raptor nest were detected in the study area during the 2016 surveys, and, with the exception of the unidentified raptor nest, were confirmed as active during the 2017 raptor nest survey.¹⁸⁵ AEP's recommended setbacks are 1,000 metres from ferruginous hawk nests and 100 metres from Swainson's and red-tailed hawk nests.¹⁸⁶

170. The referral reports stated that the presence of numerous sharp-tailed grouse leks in the project area indicate a moderate risk to sharp-tailed grouse.¹⁸⁷ Seventeen active sharp-tailed grouse leks were observed during the 2016 and 2017 sharp-tailed grouse lek surveys.¹⁸⁸ Tetra Tech stated that it did not anticipate many sharp-tailed grouse mortalities resulting from vehicle collisions because of speed limits on project access roads.¹⁸⁹ Tetra Tech stated that almost all of the project infrastructure, including all turbines,¹⁹⁰ would be located outside of AEP's 500-metre recommended setback from sharp-tailed grouse leks.

171. EDP completed a draft PCM Plan for the project in consultation with AEP to assess the impact of operation on birds. The PCM Plan included conducting a minimum three years of post-construction bird fatality surveys and conducting an investigation and consulting with AEP about the need for operational mitigation if the number of carcasses found, or if the estimated corrected fatality rates exceeds certain thresholds.¹⁹¹ Specifically, EDP committed to immediately notifying AEP, then investigating and discussing adaptive management measures, upon the discovery of: (i) the 15th distinct bird carcass at any one turbine during the same year; (ii) the 8th distinct carcass at any one turbine during a single search; and (iii) discovery of a carcass of a species at risk attributable to the operation of the project. Further, if corrected bird mortality rates are within the upper quartile of fatality rates when compared to other wind

¹⁸¹ Exhibit 22665-X0220, Appendix D - Environment - Petrie and Chouindard - SHWF Reply Evidence - EcoLogic, pages 2 and 9.

¹⁸² Exhibit 22665-X0056.02, Attachment 5 - Alberta Environment and Parks Referral Report, page 10.

¹⁸³ Exhibit 22665-X0007, Attachment 9 - Environmental Evaluation, pages 30 to 33, Table 14, and page 40.

¹⁸⁴ Exhibit 22665-X0007, Attachment 9 - Environmental Evaluation, Appendix C.

¹⁸⁵ Exhibit 22665-X0007, Attachment 9 - Environmental Evaluation, page 38; Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, page 17.

¹⁸⁶ Exhibit 22665-X0007, Attachment 9 - Environmental Evaluation, page 38.

¹⁸⁷ Exhibit 22665-X0056.02, Attachment 5 - Alberta Environment and Parks Referral Report, page 10.

¹⁸⁸ Exhibit 22665-X0007, Attachment 9 - Environmental Evaluation, page 29; Exhibit 22665-X0203, Appendix C - Environment - Wallis - SHWF Reply Evidence - TetraTech EcoLogic, page 18; Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, page 17.

¹⁸⁹ Transcript, Volume 2, pages 322-323, lines 22-5.

¹⁹⁰ Exhibit 22665-X0203, Appendix C - Environment - Wallis - SHWF Reply Evidence - TetraTech EcoLogic, page 20.

¹⁹¹ Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, Appendix E, Post-Construction Monitoring and Adaptive Management Plan, pages 13-17.

projects in similar habitat, then EDP would discuss compensatory and mitigation measures with AEP.¹⁹²

172. With respect to raptors, the PCM Plan stated that all known raptor nests for which the minimum setback is infringed by a newly constructed project access road would be monitored during the active breeding season of the first year of operation to determine nest occupancy and activity.¹⁹³ If AEP and EDP determine that the project is having a significant effect on raptor nests, then additional compensatory and/or mitigation measures would be considered.¹⁹⁴

173. With respect to sharp-tailed grouse, the PCM Plan stated that all known sharp-tailed grouse leks for which the minimum 500-metre setback is infringed by a newly constructed access road or above-ground collector line would be monitored during the active lekking season of the first year of operation to determine any impacts following construction.¹⁹⁵ If AEP and EDP determine that the project is having a significant effect on leks, then additional compensatory and/or mitigation measures would be considered.¹⁹⁶

174. Tetra Tech submitted that the substantial number of variables that could influence sharp-tailed grouse nesting success and chick survival would limit the research value of conducting long-term follow-up monitoring of leks in the study area,¹⁹⁷ and therefore this would be unnecessary as a condition of project approval.¹⁹⁸ Tetra Tech cited several studies that have documented no measurable adverse effects of nearby wind developments on the reproductive success of various prairie grouse species, and concluded that available research suggests that the response of prairie grouse to nearby wind developments is species- and location-specific.¹⁹⁹

Bats

175. Tetra Tech stated that it conducted its 2016 bat activity acoustic surveys in accordance with AEP protocols,²⁰⁰ and selected detector locations based on areas likely to be used by bats.²⁰¹ The 2016 bat surveys included detectors located on the ridge area that Mr. Wallis identified as having potential for higher bat mortalities.²⁰² EDP stated that, following AEP's

¹⁹² Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, Appendix E, Post-Construction Monitoring and Adaptive Management Plan, page 15.

¹⁹³ Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, Appendix E, Post-Construction Monitoring and Adaptive Management Plan, page 11.

¹⁹⁴ Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, Appendix E, Post-Construction Monitoring and Adaptive Management Plan, pages 15 and 17.

¹⁹⁵ Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, Appendix E, Post-Construction Monitoring and Adaptive Management Plan, page 11; Exhibit 22665-X0203, Tetra Tech Reply Evidence to the Evidence prepared by Cliff Wallis, pages 21-22; Transcript, Volume 2, page 327, lines 20-23.

¹⁹⁶ Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, Appendix E, Post-Construction Monitoring and Adaptive Management Plan, pages 15 and 17.

¹⁹⁷ Exhibit 22665-X0203, Appendix C - Environment - Wallis - SHWF Reply Evidence - TetraTech EcoLogic, page 21.

¹⁹⁸ Transcript, Volume 3, pages 557-558, lines 22-18.

¹⁹⁹ Exhibit 22665-X0203, Appendix C - Environment - Wallis - SHWF Reply Evidence - TetraTech EcoLogic, pages 21-22.

²⁰⁰ Exhibit 22665-X0007, Attachment 9 - Environmental Evaluation, page 27.

²⁰¹ Exhibit 22665-X0007, Attachment 9 - Environmental Evaluation, page 27.

²⁰² Exhibit 22665-X0203, Appendix C - Environment - Wallis - SHWF Reply Evidence - TetraTech EcoLogic, page 17.

recommendation,²⁰³ it is not planning to complete any additional pre-construction bat activity surveys unless the project does not begin construction before the fall of 2019.²⁰⁴

176. During the spring and fall 2016 bat surveys, an average of 0.59 and 0.47 bat passes per detector night, respectively, were recorded.²⁰⁵ Tetra Tech explained that this is at the lower range of bat activity reported at other wind projects in central and southern Alberta, and below AEP's one pass per detector night threshold, thereby indicating a potentially acceptable risk.²⁰⁶ Four bat species were detected during the surveys: big brown bat, hoary bat, silver-haired bat, and eastern red bat.²⁰⁷ Silver-haired and hoary bat species were the most commonly detected.²⁰⁸

177. The PCM Plan included measures to address the potential mortality impacts to bats from project operation. The PCM Plan included:

- Conducting a minimum of three years of bat fatality surveys and providing an annual estimated corrected fatality rate for bats then reporting those results to AEP.²⁰⁹
- Notifying AEP, conducting an investigation, and implementing operational bat mitigation the following year if the estimated corrected bat mortality rate exceeds an average of four fatalities per turbine per year, or more than 10 bat carcasses are detected at any one turbine during the same year, or the carcass of a bat species at risk is discovered.²¹⁰

178. Bat mitigation measures include feathering blades, altering the cut-in speed, mitigation tied to specific weather conditions and times of year that influence bat fatality risk, consideration of future technologies in consultation with AEP, and compensatory mitigation in consultation with AEP.²¹¹ EDP testified that the project's wind turbines would have an engineering design capable of measuring wind speed and wind direction within the rotor height area and that the project's meteorological towers would have the capability of measuring air temperature and barometric pressure at ground level, so individual turbines could be curtailed during weather conditions in which migratory bats are more active or vulnerable to turbine-related mortalities.²¹²

179. If additional mitigation is required by AEP to address high bat fatality levels present during the initial three-year monitoring period, EDP committed to conducting additional years of post-construction bat fatality surveys to assess the effectiveness of the mitigation.²¹³

²⁰³ Transcript, Volume 3, pages 551-552, lines 24-2.

²⁰⁴ Exhibit 22665-X0203, Appendix C - Environment - Wallis - SHWF Reply Evidence - TetraTech EcoLogic, page 18.

²⁰⁵ Exhibit 22665-X0007, Attachment 9 - Environmental Evaluation, pages 40 and 43.

²⁰⁶ Transcript, Volume 3, page 550, lines 6-12; Exhibit 22665-X0007, Attachment 9 - Environmental Evaluation, pages 42-43.

²⁰⁷ Exhibit 22665-X0007, Attachment 9 - Environmental Evaluation, pages 42-43.

²⁰⁸ Exhibit 22665-X0007, Attachment 9 - Environmental Evaluation, pages 40-43, Tables 18 and 19.

²⁰⁹ Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, Appendix E, Post-Construction Monitoring and Adaptive Management Plan, pages 4 and 8-12.

²¹⁰ Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, Appendix E, Post-Construction Monitoring and Adaptive Management Plan, pages 13-17.

²¹¹ Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, Appendix E, Post-Construction Monitoring and Adaptive Management Plan, pages 16-17.

²¹² Exhibit 22665-X0106, Information Response #3, EDP-AUC-2017DEC21-001(a), page 3.

²¹³ Transcript, Volume 2, page 329, lines 4-17; Transcript, Volume 2, page 331, lines 9-14; Transcript, Volume 2, page 333, lines 4-12.

180. With respect to specific areas of potential risk to bats, Dr. Jones stated that he did not agree with Mr. Wallis's assertion that turbines 27 to 30, 33, 53A, and 54A posed a higher risk of bat mortalities because he did not believe the topographical variation along that ridge feature was extreme enough to markedly increase bat activity and fatalities.²¹⁴

181. Dr. Jones acknowledged that there was potential for the project's predicted migratory bat mortalities during operation to interact cumulatively with migratory bat mortalities from other nearby wind projects.²¹⁵ Dr. Jones' stated that if other wind projects are located along the same migratory route, then projects within five to 15 kilometres of one another could be reasonably expected to have cumulative impacts on the larger tree-roosting migratory bat species such as hoary bats and silver-haired bats.²¹⁶

6.2.2 Views of the Clearview Group

6.2.2.1 General environmental effects and mitigation

182. The Clearview Group expressed a number of concerns about the project's potential effects on the environment, including effects on wildlife habitat such as native vegetation and wetlands, and the potential risks to waterfowl in the area.

183. Clearview Group member Mr. Wyatt Simpson also raised concerns with the project's potential effects on groundwater. He stated that the development of a wind farm has the potential to impact groundwater quality, quantity and flow, and it could impact wells.

184. The Clearview Group also raised concerns with EDP's lack of a decommissioning plan. The Clearview Group argued that there is no evidence that decommissioning and reclamation would be carried out in a manner so as to eliminate residual impacts. The Clearview Group stressed that the Commission would need actual evidence to base a public interest decision on, and there is no such evidence.

185. The Clearview Group questioned what would happen if EDP were gone by the time decommissioning and reclamation is required, and its successor lacks the resources to carry out decommissioning and reclamation. The Clearview Group acknowledged that EDP plans to deal with that situation by placing money in escrow to cover the cost of turbine decommissioning and reclamation in the event the company is no longer present in the future, but was also concerned that the amount of money in this escrow fund is unknown and that it would not be placed in escrow for 15 years.

186. The Clearview Group raised concerns that the money in escrow would not be enough to cover the cost of decommissioning and reclamation, and that the balance in excess of the money in escrow would be paid for out of the scrap value of the turbines. It questioned how the market for scrap metal 25 years from now can be forecasted, and questioned who will be responsible for decommissioning and reclamation in the event of receivership or bankruptcy. The Clearview Group also questioned what legal entitlement landowners would have to the scrap metal in the event of a bankruptcy. Mr. Kaumeyer also raised concerns and testified:

²¹⁴ Transcript, Volume 3, page 554, lines 1-23.

²¹⁵ Transcript, Volume 3, page 564, lines 13-22.

²¹⁶ Transcript, Volume 3, pages 564-565, lines 23-8.

To proceed and suggest, as EDP has stated this morning, that this abandonment cost can be fulfilled after a decision is unconscionable. As a taxpayer paying for an abandoned well program, I would ask the Commission if we have to learn this lesson twice.²¹⁷

187. The Clearview Group argued that decommissioning and reclamation has to be addressed prior to project construction and that there has to be provision made to ensure that it is going to happen and going to happen in a way that would actually reclaim the land as closely as possible to the state it is in today. Therefore, the Clearview Group submitted that should approval of the project be granted, it should be a condition of approval that EDP fully fund decommissioning and reclamation, and that the full amount of those costs should be placed in an account to make sure that it is actually there if and when needed.

6.2.2.2 Native vegetation effects and mitigation

188. Mr. Wallis raised concerns about the project's potential impacts on native grassland, as the project is within the Northern Fescue Natural Subregion, which is considered endangered due to the loss of more than 95 per cent of its native habitat.²¹⁸ Mr. Wallis noted that plains rough fescue was detected during a rare plant survey conducted in one particular quarter section in the project area, and may be present elsewhere in the project area.²¹⁹ He expressed concerns that there are no documented examples of successful restoration of a rough fescue grassland community following surface disturbance; therefore, avoidance is preferred over reclamation²²⁰ and is preferred over conservation offsets.²²¹ Mr. Wallis explained that recovery of plains rough fescue communities following disturbance is poor,²²² extremely slow (e.g., 15 to 20 years),²²³ and difficult because rough fescue does not compete well with other species.²²⁴

189. Mr. Wallis took issue with the EE Reports' approach to reclaiming native grassland as they contained no information about how restoration of native grassland would be undertaken and no recognition of the difficulty of restoring plains rough fescue vegetation.²²⁵ He submitted that Tetra Tech's assessment that the project's residual effects on native vegetation are of moderate magnitude, partially reversible through reclamation, and "not significant" does not fully recognize the difficulty of native grassland restoration and does not align with guidance

²¹⁷ Transcript, Volume 3, pages 802-803, lines 23-2.

²¹⁸ Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project, page 52.

²¹⁹ Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project, page 45.

²²⁰ Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project, page 43.

²²¹ Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-2018MAY03-030), CG-AUC-2018May03-001(c), pages 3-4; Transcript, Volume 4, page 923, lines 16-20.

²²² Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-2018MAY03-030), CG-AUC-2018May03-001(d), page 5.

²²³ Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project, page 42; Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-2018MAY03-030), CG-AUC-2018May03-001(f), page 8.

²²⁴ Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-2018MAY03-030), CG-AUC-2018May03-001(d), page 6; Transcript, Volume 4, page 902, lines 1-4.

²²⁵ Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project, page 45.

provided in AEP's 2017 *Wildlife Directive for Alberta Wind Energy Projects*.²²⁶ In Mr. Wallis' opinion, any decline of plains rough fescue vegetation communities resulting from the project should be considered a "significant" residual impact²²⁷ and, given this community's rarity and the difficulty reclaiming it following disturbance, the magnitude and significance of the project's residual effects on native grassland vegetation should have been rated as "high" and "significant", respectively.²²⁸

190. Mr. Wallis stated that the National Energy Board requires five years of post-construction monitoring for reclaimed rough fescue vegetation communities.²²⁹ Mr. Wallis further stated that the project's proposed one to two years of post-construction monitoring of vegetation re-establishment for disturbed areas being restored to native grassland is far too short because restoration of rough fescue grassland communities can take decades²³⁰ and this period of time is inconsistent with guidance in AEP's *Principles for Minimizing Surface Disturbance in Native Grassland*.²³¹

191. Mr. Wallis explained that the use of plugs can help for slow-growing species like rough fescue if used in conjunction with control of invasive species.²³² He further explained that absence of invasive species (less than 10 per cent of cover), and plains rough fescue being one of the dominant plant species present, would be an indicator of successful restoration of disturbed plains rough fescue grassland communities.²³³

192. Mr. Wallis expressed concerns that no rare plant survey was conducted in the native grassland quarter section where Turbine 9 is proposed.²³⁴ Mr. Larry Kaumeyer, a Clearview Group member, also testified that he had concerns with the proposed location of Turbine 9 on native grassland, because native grassland cannot be effectively restored or offset once it is disturbed.²³⁵

193. Mr. Wallis recommended that Turbine 9 be eliminated from the project.²³⁶ The Clearview Group requested that the Commission deny Turbine 9 in its current location²³⁷ because of its siting on native grassland, the vague, short-term, and insufficient post-construction

²²⁶ Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project, page 44.

²²⁷ Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project, page 45.

²²⁸ Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-2018MAY03-030), CG-AUC-2018May03-001(b), page 3.

²²⁹ Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-2018MAY03-030), CG-AUC-2018May03-001(d), page 7.

²³⁰ Transcript, Volume 4, page 903, lines 5-8.

²³¹ Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-2018MAY03-030), CG-AUC-2018May03-001(f), page 8.

²³² Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-2018MAY03-030), CG-AUC-2018May03-001(d), page 7.

²³³ Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-2018MAY03-030), CG-AUC-2018May03-001(e), page 8.

²³⁴ Transcript, Volume 4, page 828, lines 11-12.

²³⁵ Transcript, Volume 3, pages 799-800, lines 22-4.

²³⁶ Transcript, Volume 4, page 922, lines 11-17.

²³⁷ Transcript, Volume 5, page 1246, lines 9-11; Transcript, Volume 5, page 1298, lines 22-25.

restoration plan and monitoring proposed by EDP,²³⁸ and because micro-siting Turbine 9 would not remove it from native grassland.²³⁹

6.2.2.3 General wildlife effects and mitigation

194. Mr. Wallis discussed a number of specific concerns about the project's potential effects on wildlife including birds, raptors, sharp-tailed grouse and bats. Clearview Group members also raised a number of concerns about the project's potential general effects on wildlife, and Delta Waterfowl presented evidence on the project's potential effects to waterfowl in the area. Mr. Ross and Mr. Kaumeyer, Clearview Group members who hunt in the project area, testified about potential bird and hunting impacts and also raised concerns that the project area has elk, moose, antelope, deer and grouse populations.²⁴⁰

195. Mr. Wallis stated that turbines 9 and 27 would be sited within high wildlife habitat risk areas identified in AEP's August 2017 *Areas of Wildlife Habitat Sensitivity Map*.²⁴¹ He explained that the 2017 *Wildlife Directive for Alberta Wind Energy Projects* recommended avoiding areas identified as high risk because they are likely to be used by species at risk.²⁴² He added that turbines 28, 29 and 30 would also be sited near areas identified as high risk.²⁴³ Mr. Wallis recommended re-siting of some or all of turbines 27 to 31, 53A and 54A that are located on or near areas identified on the map as having high wildlife habitat risk.²⁴⁴ The Clearview Group also requested that turbines 27 to 31 and their associated infrastructure should be re-sited or denied entirely.²⁴⁵

196. Mr. Wallis raised concerns with the presence of ESAs within and adjacent to the project area as these particular ESAs contain rare native plant communities and wildlife species at risk, including globally significant concentrations of migrating shorebirds and migratory flyways for waterfowl and cranes.²⁴⁶

Birds

197. Mr. Wallis stated that the project's wildlife field survey coverage and amount of data collected was insufficient to determine the full use of the project area by breeding, staging, and migrating waterfowl, marsh birds, shorebirds and raptors.²⁴⁷ Mr. Wallis said that the project proposed no explicit mitigation for waterfowl, marsh birds and shorebirds.²⁴⁸

²³⁸ Transcript, Volume 5, pages 1246, lines 6-11.

²³⁹ Transcript, Volume 5, page 1246, lines 12-14.

²⁴⁰ Transcript, Volume 3, page 775, lines 1-20.

²⁴¹ Transcript, Volume 4, page 828, lines 7-10; Exhibit 22665-X0275, Map-Wildlife Habitat Sensitivity-Aug-2017.

²⁴² Transcript, Volume 4, pages 828-289, lines 23-10; Exhibit 22665-X0276, Interpreting Wildlife Habitat Sensitivity Map dated August 2, 2017.

²⁴³ Transcript, Volume 4, page 828, lines 17-19.

²⁴⁴ Transcript, Volume 4, page 924, lines 10-20.

²⁴⁵ Transcript, Volume 5, pages 1238-1239, lines 16-4.

²⁴⁶ Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project, page 53.

²⁴⁷ Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project, pages 26, 35 and 52.

²⁴⁸ Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project, page 48.

198. Mr. Wallis stated that there is a risk of passerine fatalities from turbine operation. He submitted that nocturnal passerine species at risk observed during the project's surveys were Baltimore oriole and common yellowthroat,²⁴⁹ and Baltimore oriole fatalities have been recorded at wind energy projects.²⁵⁰ Mr. Wallis explained that several other passerine species at risk also potentially pass through the project area,²⁵¹ and bird fatalities at wind power facilities are dominated by passerines, particularly nocturnal migrants.²⁵²

199. Mr. Wallis stated that remote sensing tools such as radar and acoustic technology may be necessary when a project poses a moderate to high collision risk to nocturnally active species such as migrating passerines and bats,²⁵³ and that the Canadian Wildlife Service recommends at least two years of radar monitoring studies for turbines taller than 150 metres in Atlantic Canada because turbines at this height are within the flight corridor of passerines.²⁵⁴

200. Mr. Wallis stated that wetlands are prominent in the project area and are important for biodiversity,²⁵⁵ and that there is a lack of adherence to AEP's recommended 100-metre wetland setback from project infrastructure.²⁵⁶ Furthermore, he argued that the 2011 *Wildlife Guidelines for Alberta Wind Energy Projects* stated that major wetlands providing habitat for large numbers of migrating or breeding waterfowl may need a setback greater than 100 metres. He argued that EDP did not gather enough wildlife field survey data to determine if such major wetlands are in the project area.²⁵⁷ Mr. Wallis testified that wetlands are a public resource in Alberta and should be treated that way, and therefore the default of wind proponents should be to avoid wetlands even when inconvenient to a landowner.²⁵⁸

201. Mr. Wallis made a number of recommendations relating to the project's potential effects on birds, including:

- Collect additional wildlife field data of the project area for overall use by waterfowl, marsh birds, and shorebirds, particularly around wetlands. Nocturnal migrant bird radar surveys should also be considered to provide information on passerine and waterfowl use.²⁵⁹ Should significant interactions of wildlife with the project be found, then alterations to operation should be required as a condition of approval.²⁶⁰ Mitigation must

²⁴⁹ Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-2018MAY03-030), CG-AUC-2018May03-004(a), page 16.

²⁵⁰ Transcript, Volume 4, pages 841, lines 7-9.

²⁵¹ Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-2018MAY03-030), CG-AUC-2018May03-004(b), pages 16-17.

²⁵² Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project, pages 39-40.

²⁵³ Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project, page 39.

²⁵⁴ Transcript, Volume 4, pages 841-843, lines 11-25.

²⁵⁵ Transcript, Volume 4, page 917, lines 8-10; Transcript, Volume 4, page 917, lines 24-25.

²⁵⁶ Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project, pages 52 and 54.

²⁵⁷ Transcript, Volume 4, pages 831-832, lines 23-9.

²⁵⁸ Transcript, Volume 4, pages 835, lines 17-25.

²⁵⁹ Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project, pages 40 and 54.

²⁶⁰ Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project, page 54.

not be restricted to just nighttime, but should also include periods of peak migration and inclement weather events such as fog and snowstorms.²⁶¹

- Consider establishing bird mortality thresholds for the project that would trigger operational mitigation. For example, following Ontario Ministry of Natural Resources guidance, the proponent could be required to consult with AEP and implement operational mitigation at either individual turbines, or for the project as a whole if any of the project's individual turbines exceed an estimated corrected bird mortality rate of 14 birds per turbine per year.²⁶²
- Consider using radar technology during operation to mitigate bird mortalities because it can automatically trigger curtailment when a given number of birds are detected arriving in an area.²⁶³

202. The Clearview Group requested that the Commission require project turbines and their associated infrastructure to be set back at least 100 metres from all classes of wetlands.²⁶⁴

203. Delta Waterfowl stated that the project area is located on the Central Flyway²⁶⁵ and within the Prairie Pothole Region which covers much of southern Alberta and southern Saskatchewan.²⁶⁶ It stated that the Prairie Pothole Region is the most important waterfowl breeding area in North America²⁶⁷ and its remaining wetlands provide extremely important waterfowl habitat.²⁶⁸ Delta Waterfowl stated that waterfowl generally avoid industrial wind developments, which is problematic when they are sited close to important waterfowl habitat or across migratory or feeding flight-ways.²⁶⁹ Delta Waterfowl submitted that waterfowl breeding densities in the project area approached 25 pairs per kilometre squared²⁷⁰ and that the project could potentially displace 1,000 pairs of breeding waterfowl.²⁷¹

204. Delta Waterfowl submitted that the project would create large exclusion zones and avoidance zones.²⁷² It submitted that because of the proposed turbine orientation, the project would create an 11-kilometre barrier to waterfowl movement and possibly a 32-kilometre barrier

²⁶¹ Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project, page 48.

²⁶² Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project, page 49; Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-2018MAY03-030), CG-AUC-2018May03-003(c), page 14; Transcript, Volume 3, pages 650-651, lines 24-12.

²⁶³ Transcript, Volume 4, pages 839-840, lines 18-8.

²⁶⁴ Transcript, Volume 5, pages 1253-1254, lines 23-6.

²⁶⁵ Transcript, Volume 4, page 898, lines 1-4.

²⁶⁶ Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-2018MAY03-030), CG-AUC-2018May03-012(b), page 38.

²⁶⁷ Exhibit 22665-X0279, Dr. Petrie's Opening Statement, page 1.

²⁶⁸ Exhibit 22665-X0139, Tab 19 - Evidence of Scott Petrie dated April 12, 2018 re the Impacts of the Project on Waterfowl, page 3.

²⁶⁹ Exhibit 22665-X0139, Tab 19 - Evidence of Scott Petrie dated April 12, 2018 re the Impacts of the Project on Waterfowl, page 1.

²⁷⁰ Exhibit 22665-X0139, Tab 19 - Evidence of Scott Petrie dated April 12, 2018 re the Impacts of the Project on Waterfowl, page 3.

²⁷¹ Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-2018MAY03-030), CG-AUC-2018May03-011(c), pages 35-36.

²⁷² Exhibit 22665-X0139, Assessment of Impacts of the Sharp Hills Wind Farm on Waterfowl, page 2.

from west to east if waterfowl avoid flying between turbines.²⁷³ Thus, Delta Waterfowl stated that the use of suitable waterfowl habitat in the project area by migratory waterfowl would be underutilized because waterfowl will fly around it.²⁷⁴ Delta Waterfowl clarified that these exclusion and avoidance zones have not been recognized by any regulatory bodies in Canada.²⁷⁵

205. Delta Waterfowl stated that all of the proposed turbines are located in or near cereal grain fields where waterfowl feed during spring and fall,²⁷⁶ so the project's siting would compromise the use of the area by breeding and staging waterfowl because waterfowl would avoid feeding there.²⁷⁷ Delta Waterfowl also expressed concerns that, given the turbines' size and siting in the Prairie Pothole Region, any waterfowl not displaced by the project would be subject to unacceptable mortality rates.²⁷⁸

206. Delta Waterfowl indicated that there are other areas in Special Area 3 and Special Area 4 where waterfowl densities are less than eight pairs per square kilometre and that wind power developers should first investigate siting in such areas.²⁷⁹ It suggested that cereal grain fields in areas with lower densities of wetlands and waterfowl would be acceptable sites for industrial wind projects.²⁸⁰ Delta Waterfowl concluded that the project would have substantial adverse impacts on breeding and staging waterfowl²⁸¹ and recommended that the project be relocated to another area with lower wetland and waterfowl breeding densities.²⁸²

207. Mr. Ross and Mr. Kaumeyer emphasized that the project area intersects two waterfowl migratory flyways, the Central Flyway and the Mississippi Flyway; therefore, they believed that the area has unparalleled concentrations of waterfowl.²⁸³ Mr. Kaumeyer stated that Grassy Island Lake (east of the project area) is a major staging area for geese in the fall²⁸⁴ and that he has observed waterfowl flying back and forth between Grassy Island Lake and Dry Lake (west of the project area). Mr. Ross added that Sounding Lake Dam, south of Dry Lake, is another important waterfowl staging area.²⁸⁵ Mr. Kaumeyer expressed concerns that heavy fog can be present in the project area for two to three days in the fall and that this fog would create a "killing zone" for birds near the turbines.²⁸⁶ Mr. Ross requested that the project not be approved until a third party

²⁷³ Exhibit 22665-X0139, Assessment of Impacts of the Sharp Hills Wind Farm on Waterfowl, page 3; Exhibit 22665-X0179, Clearview Group Responses to AUC Information Request Round 1, CG-AUC-2018May03-009(a), pages 30-31.

²⁷⁴ Transcript, Volume 4, pages 864, lines 1-7; Transcript, Volume 4, pages 896-897, lines 7-11.

²⁷⁵ Exhibit 22665-X0179, Clearview Group Responses to AUC Information Request Round 1, CG-AUC-2018May03-008(b), page 29.

²⁷⁶ Exhibit 22665-X0139, Assessment of Impacts of the Sharp Hills Wind Farm on Waterfowl, page 3.

²⁷⁷ Transcript, Volume 4, page 898, lines 14-22; Exhibit 22665-X0139, Assessment of Impacts of the Sharp Hills Wind Farm on Waterfowl, page 3.

²⁷⁸ Exhibit 22665-X0279, Dr. Scott Petrie Hearing Submission, page 2.

²⁷⁹ Exhibit 22665-X0179, Clearview Group Responses to AUC Information Request Round 1, CG-AUC-2018May03-011(b), 11(c), and 12(b), pages 35-38.

²⁸⁰ Exhibit 22665-X0179, Clearview Group Responses to AUC Information Request Round 1, CG-AUC-2018May03-012(a), page 38.

²⁸¹ Exhibit 22665-X0139, Assessment of Impacts of the Sharp Hills Wind Farm on Waterfowl, page 1; Exhibit 22665-X0279, Dr. Scott Petrie Hearing Submission, page 2.

²⁸² Exhibit 22665-X0139, Assessment of Impacts of the Sharp Hills Wind Farm on Waterfowl, page 4.

²⁸³ Transcript, Volume 3, page 774, lines 17-19; Transcript, Volume 3, page 789, lines 4-11.

²⁸⁴ Transcript, Volume 3, page 792, lines 18-25.

²⁸⁵ Transcript, Volume 3, pages 805-806, lines 22-1.

²⁸⁶ Transcript, Volume 3, page 797, lines 16-25.

conducted a spring and fall migratory waterfowl study.²⁸⁷ Mr. Kaumeyer requested radar surveys and analysis for the project to better capture and understand waterfowl movements at night.²⁸⁸

208. Mr. Wallis was critical of Tetra Tech's assessment that the residual effects on raptors are of low magnitude because the assessment did not account for potential cumulative impacts on raptors from other industrial activities, including other wind projects, and it did not align with AEP's assessment of a moderate risk.²⁸⁹

209. Mr. Wallis also raised concerns that the sharp-tailed grouse breeding complex, including the lek and surrounding nesting, resting, and feeding habitat, are vulnerable to human disturbance.²⁹⁰ He stated that based on current research, Alberta's recommended 500-metre setback from sharp-tailed grouse leks is inadequate to avoid adverse effects on nesting, feeding, and wintering habitat.²⁹¹ He explained that there are other life cycle habitats besides leks that are also important to sharp-tailed grouse, including nesting, foraging, and wintering habitats, but the project did not investigate these other habitats.²⁹² Mr. Wallis was critical of Tetra Tech's assessment that the project's residual effects on sharp-tailed grouse are of low magnitude and stated that it did not align with AEP's assessment of a moderate risk.²⁹³ In addition, Mr. Kaumeyer stated that the project area has uniquely large numbers of grouse.²⁹⁴

210. As a precautionary approach to protect sharp-tailed grouse, Mr. Wallis recommended removing turbines 27 to 31 from the project.²⁹⁵ Alternatively, he recommended that the Commission require a robust post-construction monitoring program to research the effects of the project on sharp-tailed grouse in the project area, focusing on lek use, nesting success, and chick survival rates.²⁹⁶ He further recommended that the Commission consider requiring some mitigation response, for example operational curtailment during a critical portion of their breeding season,²⁹⁷ if the monitoring program shows an adverse response.²⁹⁸

²⁸⁷ Transcript, Volume 3, page 780, lines 14-22.

²⁸⁸ Transcript, Volume 3, page 796, lines 1-21.

²⁸⁹ Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project, page 42.

²⁹⁰ Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project, page 37; Transcript, Volume 4, page 916, lines 3-16.

²⁹¹ Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project, page 37; Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-2018MAY03-030), CG-AUC-2018May03-005(b), page 19; Transcript, Volume 4, page 850, lines 14-20.

²⁹² Transcript, Volume 4, page 831, lines 7-16; Transcript, Volume 4, page 883, lines 4-10.

²⁹³ Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project, page 38.

²⁹⁴ Transcript, Volume 3, page 789, lines 15-24.

²⁹⁵ Transcript, Volume 4, page 909, lines 22-25.

²⁹⁶ Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project, page 38; Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-2018MAY03-030), CG-AUC-2018May03-005(a), page 19; Transcript, Volume 4, page 853, lines 3-10; Transcript, Volume 4, page 909, lines 7-21.

²⁹⁷ Transcript, Volume 4, pages 910-911, lines 10-11; Transcript, Volume 4, pages 914-915, lines 23-23.

²⁹⁸ Transcript, Volume 4, page 910, lines 4-8.

Bats

211. Mr. Wallis stated that bats most affected by wind facilities appeared to be tree-roosting migratory species with peak fatalities occurring from mid-summer through fall.²⁹⁹ He explained that there is potential for the project area to have more bat activity and to be a higher risk site for bat fatalities because of the project's location on a prominent ridge, the high density of wetlands³⁰⁰ and the project's proximity to ESAs.³⁰¹ Mr. Wallis argued that turbines 27, 28, 29, 30, 33, 53A and 54A appear to be sited on the highest portions of a prominent ridge on or near native bat habitat and therefore could be at higher risk of bat mortalities.³⁰²

212. Mr. Wallis said that the only method documented to reduce bat fatalities from wind turbines is operational curtailment during high risk periods, such as nocturnal periods of low wind speeds during migration periods.³⁰³ Mr. Wallis observed that curtailment could include stopping turbines when wind speeds dip below a certain cut-in speed, radar detecting a group of bats (or birds) approaching and stopping turbines until the group passes through, or a complete shutdown of turbines during all or part of the bat migratory season.³⁰⁴

213. Mr. Wallis stated that the evidence and the current peer-reviewed literature does not support Tetra Tech's determination that the project would have low residual impacts on bats. He argued that Tetra Tech's assessment of the project's residual effects on bats does not fully reflect or account for potential cumulative impacts on bats. Mr. Wallis referenced a 2017 peer-reviewed paper by Frick et al. that identified heightened concerns about the cumulative mortality impacts of wind energy facilities on hoary bats and other migratory bat species, including increased risk of near or total extinction.³⁰⁵ Mr. Wallis considered that the magnitude of the project's effects on bats should have been classified by Tetra Tech as moderate rather than low.³⁰⁶

214. Mr. Wallis recommended that the Commission require EDP to complete longer-term acoustic bat activity surveys in the project area (e.g., two more years of bat activity surveys for a total of three years). He suggested that radar can also be a useful technology for assessing risk to bats and developing operational bat mitigation, as it can detect bat passage rates and flight speeds.³⁰⁷ Mr. Wallis also recommended that curtailment of turbine operation, such as increased cut-in speeds at individual turbines with high mortalities and turbine shut-down at night during

²⁹⁹ Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project, page 27.

³⁰⁰ Transcript, Volume 4, page 847, lines 1-9.

³⁰¹ Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project, page 30; Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-2018MAY03-030), CG-AUC-2018May03-007(d), page 27.

³⁰² Exhibit 22665-X0190, CG Information Requests Response to EDPR (CG-EDP-2018MAY03-001 to CG-EDP-2018MAY03-028), CG-EDP-2018MAY03-009(a), page 14; Transcript, Volume 4, page 904, lines 14-17; Transcript, Volume 4, page 905, lines 2-9.

³⁰³ Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project, page 49; Transcript, Volume 4, page 824, lines 6-16; Transcript, Volume 4, page 868, lines 14-17.

³⁰⁴ Transcript, Volume 4, page 921, lines 2-18.

³⁰⁵ Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project, pages 46 and 53.

³⁰⁶ Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-2018MAY03-030), CG-AUC-2018May03-007(b), page 26.

³⁰⁷ Transcript, Volume 4, pages 838-839, lines 18-17.

migrating periods, should be the primary bat mitigation.³⁰⁸ In Mr. Wallis's view, compensation for mortalities should be viewed as a last resort or not be considered at all.³⁰⁹

215. The Clearview Group members requested that the Commission require permanent use of radar technology triggering turbine curtailment to reduce bird and bat fatalities, particularly during foggy conditions in migration season.³¹⁰ The Clearview Group also requested permanent monitoring of bird and bat carcasses throughout project operation.³¹¹

6.2.3 Commission findings

216. A considerable amount of evidence was brought before the Commission in this proceeding regarding the potential environmental effects of the project, including concerns with respect to its siting and the potential loss of wildlife habitat that may result. In this section, the Commission assesses the general environmental effects of the project, including the project's siting in relation to environmental features and any mitigation measures proposed by EDP. The Commission then considers the project's impacts on wildlife.

6.2.3.1 General environmental effects and mitigation

217. The Commission takes into account the presence of ESAs amongst other factors in assessing a project's potential environmental impacts. Mr. Wallis raised a number of concerns with the project's siting in relation to ESAs. However, the Commission considers that the location of ESAs is less useful in determining environmental impacts than other information, such as targeted field surveys that identify the presence and quality of native vegetation and wildlife habitat. The Commission is mindful that ESAs are intended to be used as a planning tool and are not, in and of themselves, intended to restrict development.

218. With respect to the project's siting in relation to wetlands, the Commission finds the siting of project infrastructure on cultivated lands, and *not* on wetlands, significantly mitigates the project's potential effects on wetlands. The referral reports indicate that the encroachments of some of the project's access roads and collector lines on AEP's minimum wetland setbacks was acceptable to AEP, given the project's proposed mitigation and overall residual effects on wetlands. The Commission has taken AEP's perspective into account as part of its overall consideration of whether the proposed setbacks from wetlands in the project area are reasonable, in light of the other evidence submitted in respect of the project's effects on wetlands and the mitigation measures proposed by EDP. The Commission notes that AEP was aware of the justifications for the relaxations of the wetland setbacks when it issued the referral reports following consultation with EDP. Overall, the Commission is satisfied that EDP's approach to siting roads and collector lines is reasonable in the circumstances.

219. Taking into account the project's siting, the Commission finds that with diligent implementation of the mitigation measures proposed, the project's effects on groundwater, surface water bodies, wetlands, ESAs and soils can be mitigated to an acceptable degree. The Commission recognizes that EDP committed to the following:

³⁰⁸ Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project, page 54.

³⁰⁹ Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project, page 51.

³¹⁰ Transcript, Volume 5, page 1243, lines 5-14.

³¹¹ Transcript, Volume 5, page 1243, lines 22-25.

[EDP] will implement the environmental protection measures as identified in the 2017 AEP Wildlife Referral Report, Environmental Evaluation Reports and associated appendices, including the Construction and Operations Plan and the Post Construction Monitoring and Adaptive Management Plan³¹² [period absent in source]

220. The Commission considers adherence to such mitigation measures, and to any additional measures recommended by AEP, are essential to reducing the project's environmental impacts. AEP's involvement in a project includes an oversight role throughout the construction and operation phases of a project. Accordingly, should the Commission approve the project, the approval granted will be subject to the following conditions.

- EDP shall abide by all of AEP's requirements, recommendations, and directions outlined in the referral reports³¹³ and any additional commitments made in its correspondence with AEP³¹⁴ and its undertaking response³¹⁵ to the Commission. This includes keeping the project's wildlife data current until the project is commissioned by updating the pre-construction wildlife field surveys when they expire. As necessary, EDP shall continue to consult with AEP throughout construction and operation of the project, and implement any additional mitigation measures recommended by AEP.
- EDP shall abide by all of the commitments and recommendations included in its final version of the Construction and Operation Mitigation Plan developed for the project. EDP shall implement all mitigation measures identified in the Construction and Operation Mitigation Plan and monitor the effectiveness of its mitigation measures. If mitigation measures are unsuccessful, EDP, in consultation with AEP, must develop and implement additional mitigation to minimize adverse effects on the environment.

221. With respect to decommissioning and reclamation at the project's end of life, the *Conservation and Reclamation Regulation* was recently amended to specifically address the reclamation of wind projects in Alberta. The effect of these amendments is that "renewable energy operations", which include wind plants, are now included in the definition of "specified lands" under the *Environmental Protection and Enhancement Act*. Accordingly, the operators of renewable energy operations, such as EDP, are now expressly subject to the reclamation obligations set out in Section 137 of the *Environmental Protection and Enhancement Act*. Operators of renewable energy operations are now required to obtain a reclamation certificate, which is managed by AEP. Further, on September 14, 2018, the Government of Alberta released a *Conservation and Reclamation Directive for Renewable Energy Operations*, which provides more detailed information on conservation and reclamation planning and reclamation certificate requirements for renewable energy operators in Alberta.³¹⁶

222. EDP acknowledged its statutory obligation to decommission the project and reclaim the project footprint in accordance with the *Environmental Protection and Enhancement Act* and any development permit issued by the Special Areas Board. EDP confirmed its responsibility for

³¹² Exhibit 22665-X0289, Outstanding Undertakings, page 6.

³¹³ Exhibit 22665-X0005, Attachment 6 - AEP Referral Report; Exhibit 22665-X0056.02, Attachment 5 - Alberta Environment and Parks Referral Report.

³¹⁴ Exhibit 22665-X0120, Attachment CVIR1-024-01 - AEP Correspondence Part 1 of 2; Exhibit 22665-X0121, Attachment CVIR1-024-01 - AEP Correspondence Part 2 of 2.

³¹⁵ Exhibit 22665-X0289, Outstanding Undertakings.

³¹⁶ Government of Alberta – Alberta Environment and Parks (GOA: AEP). 2018. Conservation and Reclamation Directive for Renewable Energy Operations. Edmonton, Alberta.

decommissioning and reclamation costs and also noted that its responsibility is reflected in its lease agreements with project landowners. EDP confirmed that, in addition to relying upon the salvage value of project equipment, it had also committed to set aside reclamation funds starting in the project's 15th year of operation.

223. The Commission's predecessor, the Alberta Energy and Utilities Board, commented on reclamation and decommissioning obligations of power plant proponents in Decision 2001-101 as follows:

[...] the public and the province are entitled to the assurance that significant liabilities such as decommissioning costs, reclamation costs and potential public liability for injury or damage to persons or property are properly addressed in power plant applications.³¹⁷

224. With respect to reclamation of the project at the end of its useful life, the Commission has taken into account the expected salvage value of project components, that EDP included lease provisions with landowners to set aside reclamation funds, and that EDP has legal obligations to properly decommission and reclaim the project under provincial legislation, as well as in its lease agreements with participating landowners. The Commission finds that EDP has taken a proactive approach to ensure the effective decommissioning and reclamation of the project.

6.2.3.2 Native vegetation effects and mitigation

225. As the Commission observed in Decision 22563-D01-2018:

One of the primary environmental concerns associated with siting wind generation projects is the impact on native prairie. As the Commission understands it there is an inability to re-create some types of native prairie which may lead to permanent habitat loss which in turn impacts wildlife. In its past decisions, the Commission has encouraged applicants to seek ways to minimize impacts on native prairie. The Commission finds the siting of all wind turbines, the substation, collector system and access roads on cultivated lands and not on native grasslands or native pasture significantly mitigates the project's potential adverse effects on native vegetation.³¹⁸

226. The Commission finds that the siting of the vast majority of the project infrastructure on cultivated lands, and not on native grasslands, significantly mitigates the project's potential adverse effects on native vegetation. In addition, the Commission notes that the rare vegetation survey methodology used for the project was vetted with AEP,³¹⁹ and based on the information before it, the Commission finds that those surveys were properly conducted and sufficient for evaluating risk to native grassland within the project area.³²⁰

227. EDP indicated that construction activities will be managed to prevent the introduction and spread of noxious and prohibited noxious weeds in accordance with the Alberta *Weed Control Act*, and that annual weed monitoring will be conducted within or adjacent to the project

³¹⁷ Decision 2001-101, AES Calgary ULC - 525-MW Natural Gas-Fired Power Plant, Application 2001113, December 11, 2001, section 9.1.3, pages 48-49.

³¹⁸ Decision 22563-D01-2018: Capital Power Generation Services Inc. - Halkirk 2 Wind Power Project, Proceeding 22563, Applications 22563-A001 and 22563-A002, April 11, 2018, paragraph 239.

³¹⁹ Transcript, Volume 2, page 308, lines 4-7; Transcript, Volume 3, page 562, lines 13-16.

³²⁰ Transcript, Volume 2, page 308, lines 10-25.

footprint during operation, and all detected weed occurrences will be controlled or eradicated.³²¹ The Commission considers that these measures will help control the project's effects on vegetation in the area.

228. However, the Clearview Group raised significant issues with the project's impacts to native grassland in the area. In particular, the Clearview Group questioned the feasibility of adequately reclaiming the plains rough fescue grassland community type, which called into question the effectiveness of EDP's plans for ensuring minimal impacts to native grassland in the project area.

229. The Commission acknowledges that remnant areas of native vegetation, particularly rough fescue grassland communities, can provide important habitat for several provincial and federal species at risk, and considers that an inability to recreate certain grassland types can lead to permanent habitat loss for wildlife. The evidence demonstrates that the native grassland in the project area contains habitat for several wildlife species at risk, including the provincially endangered ferruginous hawk, the provincially sensitive sharp-tailed grouse, and several provincial grassland breeding bird species at risk.

230. The Commission considers that the evidence before it demonstrates that the restoration of northern fescue grassland communities to a healthy mid-to-late seral stage native grassland plant community is documented to be difficult and slow, and outcomes have been poor. Mr. Wallis provided considerable evidence³²² on this matter, and Tetra Tech acknowledged this difficulty and the level of uncertainty involved in attempting to reclaim this type of native grassland community.³²³

231. Turbine 9 is proposed to be located on native grassland, and while EDP committed to micro-siting Turbine 9 and associated infrastructure (moving up to 50 metres in any direction from the applied-for location without an amendment application, as permitted under Rule 007), any such measure would be subject to other applicable constraints, such as the Special Areas Board's property line and noise compliance setbacks. As a result, the Commission is not convinced that micro-siting Turbine 9 will adequately mitigate its effects on native grassland without the adoption of additional mitigation measures. Because complete avoidance of native grassland was not achieved in the project layout, the Commission must consider the mitigation measures proposed by EDP to reclaim and restore those areas.

232. As discussed above, the project's proposed construction footprint is composed of 27 hectares of native grassland, while the permanent operational footprint would be less than one hectare of native grassland. The Commission finds that EDP's proposed one year of monitoring of soil health and vegetation establishment on disturbed areas being restored to native grassland is insufficient. The Commission notes that current AEP guidelines indicate a longer period of monitoring is necessary to ensure restoration activities are successful, including a requirement that assessments be conducted at years five and 10. The Commission considers this level of

³²¹ Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, Supplemental Environmental Evaluation Addendum Revision 3, page 110.

³²² Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project, pages 42-45; Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-2018MAY03-030), CG-AUC-2018May03-001, pages 1-9.

³²³ Exhibit 22665-X0203, Appendix C - Environment - Wallis - SHWF Reply Evidence - TetraTech EcoLogic, page 15; Exhibit 22665-X0290, Reply Argument, page 6, paragraph 15; Transcript, Volume 2, pages 368-369, lines 10-12.

monitoring to be particularly important to ensure the process of native species recovery is proceeding adequately.³²⁴ The Commission also notes that EDP suggested in response to an information request and in testimony that additional monitoring beyond one year on a case-by-case basis may be appropriate depending on the results of that monitoring.³²⁵

233. Based on the current version of EDP's Construction and Operation Mitigation Plan and the mitigation measures proposed within it, EE Reports, and information responses and testimony, the Commission is not satisfied that EDP has adequately accounted for the challenges of successfully restoring native grassland vegetation in the project area following construction. For example, the Commission notes that EDP proposed, as one of its mitigations to help achieve successful restoration of the plains rough fescue rare ecological community, to over-plant plains rough fescue plugs at the start of restoration.³²⁶ During the hearing, however, EDP acknowledged unfamiliarity with how easy or difficult it would be to obtain the plugs and accordingly execute that type of reclamation activity.³²⁷ The Commission also observes that EDP will be required to prepare a post-construction reclamation plan to satisfy the requirements of the Special Areas Board development permit approval,³²⁸ and notes that EDP has not yet established post-construction interim reclamation targets.³²⁹

234. Given the risk of adverse impacts on wildlife arising from the project's proposed disturbance to native grasslands and the rarity of mid-to-late seral stage northern fescue grassland vegetation communities, particularly the plains rough fescue grassland community, the Commission finds that additional measures are warranted to mitigate or compensate for the project's residual impacts on native grasslands. The Commission notes that EDP indicated during the hearing that it would consider investigating and implementing native grassland conservation offsets.

235. The Commission noted in Decision 22755-D01-2018:

A conservation offset counteracts losses of native grassland area, and functionality, in one part of the [subregion] with an equivalent gain in grassland area and functionality, in another part of the same subregion. This ensures that the total amount and quality of native grasslands in this subregion does not decrease.³³⁰

³²⁴ For example, AEP's *Principles for Minimizing Surface Disturbance in Native Grassland* document cited by Mr. Wallis recommends that "[l]ong-term monitoring of re-vegetated areas is necessary until the appropriate native plant community has been re-established", and AEP's *Industrial Activity in the Central Parkland and Northern Fescue Native Grasslands - Strategies for Minimizing Surface Disturbance* document, also cited by Mr. Wallis, states that "[w]ell-designed monitoring programs are particularly important during the first five years following construction and reclamation" and "... assessments conducted at years 5 and 10 are particularly important to ensure the process of native species recovery is proceeding well": Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-2018MAY03-030), Response to IR CG-AUC-2018May03-001(f), page 8.

³²⁵ Transcript, Volume 3, page 545, line 23 to page 546, line 3.

³²⁶ Exhibit 22665-X0203, Appendix C - Environment - Wallis - SHWF Reply Evidence - TetraTech EcoLogic, pages 14-15.

³²⁷ Transcript, Volume 3, page 546, lines 13-23.

³²⁸ Transcript, Volume 3, page 546-547, lines 24-14.

³²⁹ Transcript, Volume 3, page 617, lines 13-24.

³³⁰ Decision 22755-D01-2018: MAXIM Power Corp. – Buffalo Atlee Wind Power Project – Phase 1 Buildable Area, Proceeding 22755, Application 22755-A001, February 7, 2018, page 7, paragraph 39.

236. The Commission is of the view that a conservation offset can partially compensate for a project's negative impacts on native grasslands when complete avoidance is not possible. Accordingly, in addition to the reclamation measures proposed by EDP in this proceeding, including any measures in EDP's post-construction interim reclamation targets approved by the Special Aras Board, and including EDP's commitment to use micro-siting in the placement of Turbine 9, the Commission considers that a conservation offset is required to compensate for the project's negative impacts on native grassland.

237. Based on the foregoing, the approval of the project would necessarily include the following conditions:

- If any ACIMS S1 or S2 ranked rare plants or ecological communities are discovered on or within 30 metres of the project's construction footprint during future pre-disturbance field work, then the Commission directs EDP to avoid these vulnerable features. If avoidance is not possible, then EDP shall develop mitigation measures in consultation with AEP to reduce the project's potential adverse effects on these plant species.
- The Commission directs EDP to prepare a comprehensive Native Grassland Post-Construction Reclamation and Restoration Plan in consultation with AEP. This plan will provide details about how the project will successfully restore areas of native vegetation disturbed during construction to a healthy mid-to-late seral stage native grassland plant community. The finalized version of this plan must be submitted to the Commission by the end of the project's construction phase.
- The Commission directs EDP to conduct post-construction monitoring of soil health and vegetation re-establishment for a period to be determined in consultation with AEP. Should monitoring results indicate that reclamation efforts are unsuccessful, EDP shall implement mitigation measures in consultation with AEP.
- The Commission directs EDP to micro-site Turbine 9 and its associated access road, collector line, and workspace to attempt to further reduce the amount of native grassland disturbance during construction and operation.
- The Commission directs EDP to implement a native grassland conservation offset equal to or greater than the amount of native grassland temporarily or permanently disturbed through construction and operation of the project, and confirm in writing to the Commission that this condition has been fulfilled, within one year of commencing operation.

6.2.3.3 General wildlife effects and mitigation

238. The Commission finds that the siting of most project infrastructure on cultivated lands, and *not* on native grasslands, will reduce the potential for adverse effects on wildlife and wildlife habitat. With diligent application of the proposed mitigations, and monitoring and implementation of the Commission's conditions of approval, the potential adverse wildlife effects from construction and operation of the project can be sufficiently mitigated.

239. Based on the Commission's review of the EE Reports, EDP's reply evidence and responses to information requests, hearing testimony, and the referral reports, the Commission finds that, while the pre-construction wildlife surveys conducted for the project did not cover

every part of the project area, the survey approach adopted was reasonable in the circumstances. The Commission expects EDP to abide by its commitment to engage in ongoing discussions with AEP and to complete further pre-construction wildlife surveys as required or recommended by AEP and the Commission.

240. The Commission finds, based on the EE Reports, that four amphibian species at risk, namely the northern leopard frog, Canadian toad, Great Plains toad and plains spadefoot toad, are potentially present in the project's study area.³³¹ The Commission considers that incursions into the 100-metre setbacks for Class 3 to Class 5 wetlands can potentially compromise breeding of amphibian species at risk and decrease the use of these wetlands by birds and other wildlife. Although none of the wind turbines are proposed to be located within 100 metres of any wetlands, portions of the project's collector lines and access roads are proposed to be located within this setback. This may result in adverse affects to amphibians and their habitat. Accordingly, the Commission finds that the following condition is required:

- Prior to any construction related ground disturbance that occurs within 100 metres of any Class 3 to Class 5 wetland, EDP shall consult with AEP about the completion of any additional amphibian pre-construction surveys. If AEP recommends additional surveys, EDP must conduct the surveys, notify AEP of the results and implement any mitigation measures recommended in consultation with AEP if any amphibian species at risk are detected.

Birds

241. The Commission observes that several passerine species at risk were observed in the wildlife survey area during the various 2016 pre-construction wildlife surveys. However, based on its review of the EE Reports and the referral reports, the Commission accepts AEP's assessment that the project poses a moderate risk to passerines due to the height of the proposed turbines and the presence of sensitive species that may be at risk of collisions with turbines.

242. Delta Waterfowl submitted that breeding waterfowl densities in the project area are up to 25 pairs per square kilometre. However, when Dr. Petrie was questioned about this assessment during testimony, it appeared that the waterfowl breeding pairs data cited by Dr. Petrie was not generated for the specific boundaries of the project area, but rather by flying a plane over "transect" flight corridor areas.³³² Therefore, it is unclear to the Commission how closely the transect being relied on by Delta Waterfowl corresponds with the boundaries of the project area. As a result, the Commission cannot assign much weight to the evidence provided by Delta Waterfowl regarding the breeding waterfowl density in the project area.

243. However, three active ferruginous hawk nests were observed in the survey area in both 2016 and 2017. The ferruginous hawk has a federally endangered status and provincially threatened status and is susceptible to colliding with wind turbines and having its breeding activities disturbed by industrial development.³³³ The Commission accepts AEP's assessment that

³³¹ Exhibit 22665-X0007, Attachment 9 - Environmental Evaluation, Appendix C, page 120.

³³² Transcript, Volume 4, pages 887-890, lines 13-24.

³³³ Exhibit 22665-X0056.02, Attachment 5 - Alberta Environment and Parks Referral Report, page 10; Exhibit 22665-X0007, Attachment 9 - Environmental Evaluation, page 76; Exhibit 22665-X0058.01, Attachment 7 - Environmental Evaluation, Supplemental Environmental Evaluation Addendum Revision 3,

the project poses a moderate risk to raptors and considers that post-construction bird carcass monitoring and implementation of mitigation measures in consultation with AEP is necessary to mitigate the risk to ferruginous hawks in the project area.

244. AEP assessed the project's risk to sharp-tailed grouse as moderate due to the presence of 17 sharp-tailed grouse leks recorded in the project area during the 2016 and 2017 surveys. The Commission notes that the most recent referral report for the project estimates approximately 1.8 per cent of the overall potential project footprint will intersect with wildlife setback buffers for sensitive species,³³⁴ which would include AEP's 500-metre year-round minimum setback from sharp-tailed grouse leks. The project's draft PCM Plan states that all known sharp-tailed grouse leks upon which the minimum 500-metre setback is infringed by a newly constructed project access road or above-ground collector line will be monitored during the active lekking season of the first year of operation.³³⁵ The Commission also notes that AEP was aware of, and took into account, the reduced setbacks to sensitive species, and the justifications for doing so, when it issued the referral reports.

245. Given the recorded presence of sharp-tailed grouse leks in the project area, the Commission finds that strict adherence to the monitoring commitment will be important to determine whether, and to what extent, the project has impacted sharp-tailed grouse lekking activity following construction. The Commission also considers that adherence to the mitigation and compensation measures specified in the PCM Plan will be important in mitigating impacts to sharp-tailed grouse. Those mitigations committed to by EDP as part of its adaptive management strategies for impacts to avian species include onsite monitoring, experimentation with visual or auditory deterrents, habitat restoration and funding of conservation initiatives.³³⁶

246. The Commission agrees with Mr. Wallis that leks are not the only life cycle habitat types that require protection in order to conserve sharp-tailed grouse in the province, and that avoiding nesting, breeding, feeding and wintering habitat are also important. Given the number of leks and associated sharp-tailed grouse habitat in the project area, the Commission finds there is a need for project-specific monitoring of sharp-tailed grouse. Accordingly, the Commission will include the conditions set out below as part of the project's approval to address its potential impacts on birds, including sharp-tailed grouse.

Bats

247. The criteria in the *Bat Mitigation Framework for Wind Energy Projects* document classifies the project area as a potentially low risk site for bat fatalities, based on the results of the pre-construction bat surveys that showed an average of less than 2.0 bat passes per detector per night.³³⁷

pages 56 and 134; Exhibit 22665-X0140, Tab 18 - Evidence of Cliff Wallis dated April 2018 re the Environmental Impacts of the Project, page 39.

³³⁴ Exhibit 22665-X0056.02, Attachment 5 – AEP Referral Report Amendment, page 10.

³³⁵ Exhibit 22665-X0058.01, Attachment 7 – Environmental Evaluation, Appendix E, page 134.

³³⁶ Exhibit 22665-X0058.01, Attachment 7 – Environmental Evaluation, Appendix E, page 138.

³³⁷ Exhibit 22665-X0007, Attachment 9 - Environmental Evaluation, page 120.

248. The Commission notes that EDP plans to complete an additional year of pre-construction bat acoustic surveys if the project does not begin construction before the fall of 2019, which the Commission considers would be a useful measure to ensure wildlife data is kept current.³³⁸

249. The Commission also notes that the PCM Plan contains several commitments for monitoring, assessing and minimizing the potential impact of the project on bats, including:

- A minimum of three years of bat fatality surveys.
- Providing an annual estimated corrected fatality rate for bats.
- If the estimated corrected bat mortality rate exceeds an average of four fatalities per turbine per year, or more than 10 bat carcasses are detected at any one turbine during the same year, or the carcass of a bat species at risk is discovered, EDP shall notify AEP, conduct an investigation, and implement operational bat mitigation measures the following year in consultation with AEP.

250. EDP also committed to conducting additional years of bat fatality surveys to assess the effectiveness of the mitigation if AEP recommends further mitigation to address high bat fatality levels during the initial three-year monitoring period.

Wildlife conditions

251. Factoring in the evidence presented by both EDP and the Clearview Group, and AEP's post-construction wildlife requirements set out in the *2017 Wildlife Directive for Alberta Wind Energy Projects* and in the referral reports, the Commission determines the following wildlife-related conditions to be required:

- The siting, construction and operation of the project's infrastructure shall meet all of AEP's recommended minimum setbacks for both wetlands and watercourses and wildlife species at risk habitat features for the project, unless AEP has agreed to: a reduced setback; alternative mitigation in the project's referral reports; or approval under the *Water Act* for the project.
- EDP shall abide by any requirements and commitments outlined in its final version of the PCM Plan developed for the project unless otherwise directed by AEP. EDP shall submit to the Commission annually a copy of the project's post-construction wildlife monitoring report along with correspondence from AEP summarizing its views on the report for a minimum of three years, as outlined in EDP's PCM Plan, and any additional period as specified by AEP.
- EDP shall implement mitigation measures, in consultation with AEP, if the results of the post-construction bat carcass monitoring program indicate that the estimated corrected rate of bat fatalities for the project exceeds an average of four fatalities per turbine per year, or any other lower threshold included in the PCM Plan or required by AEP. Additionally, EDP shall implement mitigation measures if the results of the

³³⁸ Exhibit 22665-X0203, Appendix C - Environment - Wallis - SHWF Reply Evidence - TetraTech EcoLogic, page 18.

post-construction bat carcass monitoring indicate bat fatalities in the vicinity of any individual turbine are unacceptable to the AEP. Mitigation measures may include:

- Increasing the turbine cut-in wind speed.
 - Stopping blades from idling during low wind speeds not conducive to electricity generation.
 - Feathering or altering the angle of the turbine blades.
 - Temporarily shutting down the turbines during certain periods of the year, weather conditions, and/or time of day during which migratory bats are more active or vulnerable to turbine-related mortalities.
 - Monitoring advancements made in turbine bat mitigation throughout the life of the project and, in consultation with AEP, implementing any other mitigation methods/technologies as they become commercially available and/or their effectiveness is substantiated over time (e.g., acoustic or electromagnetic deterrents or using radar/infrared photography to detect bats).
- Following completion of the post-construction wildlife monitoring program, EDP shall communicate to AEP the discovery of any carcasses of species at risk which might be observed near project infrastructure during operation or maintenance and, if required, implement any new mitigation measures that AEP may recommend to prevent or reduce further mortalities.
 - If any changes are made to the micro-siting of the wind turbines, roads, collector lines, and other infrastructure associated with the project, the construction schedule, or the proposed wildlife mitigation measures, EDP shall submit these changes to AEP for its review to ensure wildlife and wildlife habitat are protected.
 - EDP shall conduct a thorough pre-construction nest search survey to identify nests located in trees, on the ground, and around the shores of wetlands. The survey area boundary for this pre-construction nest search survey should be extensive enough to cover AEP's recommended setbacks for the nests of species at risk that may nest within or near the project area. If any nests are detected, EDP shall implement the mitigation measures itemized in its Construction and Operation Mitigation Plan and in consultation with AEP.
 - The Commission directs EDP to prepare and submit a study examining the use of radar as a prediction and mitigation tool for project-related bird and bat mortality rates. This study shall identify existing applicable radar technology and, if available, provide examples of where such technology is currently employed, and the results of its deployment. The study shall include a cost estimate for implementing a radar monitoring plan, including the cost of the necessary equipment, monitoring costs, and any costs associated with related mitigation (i.e., manual or automated intervention) for the project. EDP shall file the study by no later than June 21, 2019. The Commission will review the study and, if directed by the Commission as a result of its review, EDP shall implement a radar monitoring program.

- EDP shall complete four years of monitoring (one year during construction and the first three years of operation) during the sharp-tailed grouse lek season assessing the effects of construction and operation of the project on the lek use, nesting success/productivity, and chick survival rates at each of the sharp-tailed grouse lek sites and surrounding nesting habitat present in the project area. The data collected shall be analyzed and presented in an interim report at the end of two years and a final report at the end of the monitoring period. Both reports shall be submitted to the Commission and AEP. If, following its review of the interim report and/or the final report, AEP determines that the project has had an adverse effect on sharp-tailed grouse breeding and survival in the project area, then the Commission directs EDP to consult with AEP about any additional project mitigation measures that may be required.

252. The Commission notes that Standard 100.4.4 of AEP's 2017 *Wildlife Directive for Alberta Wind Energy Projects*, which requires that a minimum of one-third of the turbines be monitored during the post-construction wildlife monitoring program, specifies only a minimum number of turbines that must be monitored, and not a maximum number. Given the interveners' concern that there is potential for the project area to have more bat activity and to be a higher risk site for bat fatalities because of the project's location on a prominent ridge, the high density of wetlands³³⁹ and the project's proximity to ESAs, the Commission finds that the following condition is required:

- In addition to any representative turbines selected for the project's post-construction bat carcass surveys in consultation with AEP in accordance with the stratified random sample method, EDP shall also survey any turbines that are located near roost sites of tree-roosting migratory bat species, a valley and coulee edge, a ridge system, and areas of foraging habitat that have a higher risk of bat mortality. For the project, this specifically includes turbines 9, 27 to 31, 33, 53A, and 54A and any other turbines that are situated within or near the high wildlife habitat risk areas identified in AEP's August 2017 *Areas of Wildlife Habitat Sensitivity Map*, unless otherwise determined in consultation with AEP. The carcass survey results for any additional turbines monitored under this requirement should not be factored into the corrected bat mortality rate that is generated for the overall project from the carcass survey results for the one third of turbines selected using the stratified random sample method.

6.2.3.4 Environmental effects conclusion

253. The Commission has considered the evidence on the record of this proceeding in assessing the environmental effects of the project, including the mitigation and monitoring plans established by EDP in consultation with AEP, the various commitments made by EDP and its adherence to applicable regulatory standards, directives and guidelines.

254. The Commission considers that compliance with its conditions of approval are of paramount importance in its assessment that the environmental effects of the project can be adequately mitigated. Given the number of conditions set out above and the importance of adherence to those conditions in mitigating the potential for adverse environmental effects resulting from the project, the Commission finds that the following condition is also required:

³³⁹ Transcript, Volume 4, page 847, lines 1-9.

- During the project's construction phase and following the first three years of operation, EDP shall annually submit a letter to the Commission explaining the steps taken by EDP to comply with the Commission's approval conditions, and indicating any conditions that remain outstanding.

255. The Commission concludes that with application of the conditions set out above, the potential adverse environmental effects from construction and operation of the project can be adequately mitigated.

7 Noise

7.1 Introduction

256. EDP retained RWDI to prepare a noise impact assessment (NIA) for the project, which was submitted in support of EDP's applications to the Commission. The project's initial NIA³⁴⁰ was updated to reflect the project's reduced number of turbines and the final NIA was filed on December 8, 2017 (the project NIA).³⁴¹ EDP retained Ms. Teresa Drew from RWDI to provide evidence on the project's noise impact and wind turbine noise. Ms. Drew was the primary author of the project NIA, authored a reply evidence report in response to issues raised by the Clearview Group³⁴² and testified at the hearing.

257. The Clearview Group retained Mr. Henk de Haan of dBA Noise Consultants Ltd. (dNCL) to review the project NIA and related noise documents. Mr. de Haan authored a report analyzing the project NIA and other noise-related evidence,³⁴³ developed noise models that predicted different sound levels than those predicted by RWDI and testified at the hearing.

258. In this section, the Commission considers the noise impact that the proposed turbines and associated infrastructure will likely generate at nearby residences. The Commission will first provide a description of the NIA requirements in Rule 012 with a focus on those requirements that were at issue in this proceeding, then provide an overview of the noise models produced by RWDI and dNCL. The Commission will then discuss the parties' respective views on whether the project complies with Rule 012, and finally will provide its findings with respect to Rule 012 compliance, including potential low frequency noise issues.

7.2 Rule 012: Noise Control

259. Rule 012 is designed to ensure that the noise from a proposed facility, combined cumulatively with noise from other nearby energy-related facilities, will not exceed the permissible sound levels (PSLs) defined in Rule 012. Applicants must provide an NIA as part of a new power plant application under Rule 007, which predicts the potential noise impact of a proposed facility under normal operating conditions at the most impacted dwellings.

³⁴⁰ Exhibit 22665-X0059, Attachment 8 - Noise Impact Assessment.

³⁴¹ Exhibit 22665-X0059.01, Attachment 8 - Noise Impact Assessment.

³⁴² Exhibit 22665-X0200, Appendix B - Noise - SHWF Reply Evidence - RWDI.

³⁴³ Exhibit 22665-X0138, Tab 20 - Evidence of Henk de Haan dated April 17, 2018 re Noise Impacts.

260. The PSL is the maximum daytime or nighttime sound level as determined at a point 15 metres from a dwelling(s) in the direction of the facility. The cumulative sound level, which is compared to the PSL for compliance determination, includes:

- The assumed or measured ambient sound level (ASL).
- The contribution from existing, approved, and proposed third-party energy-related facilities.
- The predicted sound level from the applicant's proposed facility.

261. Rule 012 sets out the requirements for preparing an NIA. Section 3.2(5) specifies factors that must be considered in an NIA, which include, among others, meteorological parameters, sound source identification, sound power level and spectra, modelling standards, and ground conditions and ground attenuation factors. Rule 012 requires the use of models that meet accepted protocols and international standards for predicting a project's cumulative sound level. Rule 012 identifies the International Organization for Standardization (ISO) 9613-2 standard (ISO 9613-2)³⁴⁴ and the Conservation of Clean Air and Water in Europe protocol (CONCAWE)³⁴⁵ as examples of accepted protocols and international standards. RWDI used the ISO 9613-2 standard whereas dNCL used the CONCAWE method in their respective reports.

262. ISO 9613-2 sets out a methodology to determine the attenuation of sound as it propagates outdoors. The ISO 9613-2 standard accounts for factors such as ground effect, temperature, humidity and wind conditions, which are parameters to characterize outdoor noise propagation.

263. The ISO 9613-2 standard accounts for ground attenuation through using a ground factor G, ranging from 0 to 1. The ISO 9613-2 standard sets out three types of ground surface:

- **Hard ground**, which includes paving, water, ice, concrete and all other ground surfaces having a low porosity. Tamped ground, for example, as often occurs around industrial sites, can be considered hard. For hard ground, $G = 0$.
- **Porous ground**, which includes ground covered by grass, trees or other vegetation, and all other ground surfaces suitable for the growth of vegetation, such as farming land. For porous ground, $G = 1$.
- **Mixed ground**: if the surface consists of both hard and porous ground, then G takes on values ranging from 0 to 1, the value being the fraction of the region that is porous.³⁴⁶

264. The CONCAWE method allows modellers to enter specific wind speed, wind direction, and atmospheric stability conditions when developing noise models. The CONCAWE method accounts for atmospheric stability using seven Pasquill Stability Classes: Class A: extremely unstable, Class B: moderately unstable, Class C: slightly unstable, Class D: neutral condition,

³⁴⁴ International Standards Organization (ISO), ISO 9613-2, Acoustics – Attenuation of sound during propagation outdoors - Part 2: General method of calculation, Geneva, 1996.

³⁴⁵ Conservation of Clean Air and Water – Europe (CONCAWE), 1981. The propagation of noise from petroleum and petrochemical complexes to neighbouring communities. Report No. 4/81, May 1981.

³⁴⁶ ISO 9613-2, First edition 1996-12-15, Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation, page 9.

Class E: slightly stable, Class F: moderately stable, and Class G: extremely stable.³⁴⁷ Higher atmospheric stability corresponds to more favorable sound propagation, which leads to higher sound levels at receptors.

265. Rule 012 requires that the sound power level modelled for a wind turbine must correspond to the maximum noise emitted when the wind turbine operates under the planned maximum operating conditions for both the daytime and nighttime period.

266. Representative conditions for meteorological parameters are not explicitly defined in Rule 012 for noise propagation modelling. However, Rule 012 defines representative conditions for valid measurement results during noise monitoring and associated data processing. Rule 012 requires that sound levels be measured under representative conditions and that any condition that occurs at least 10 per cent of the time for a particular season should be considered as part of representative conditions.

267. Rule 012 does not explicitly define receptor heights for noise prediction modelling. However, Rule 012 defines microphone heights for noise monitoring as 1.5 metres above ground for one-storey dwellings and 4.5 metres above ground for two-storey dwellings.

268. Finally, Rule 012 defines low frequency noise (LFN) as sound that occurs in the frequency range from 20 to 250 hertz. In accordance with Rule 012, a LFN condition may exist when the dBC minus dBA value is greater than or equal to 20 decibels (dB), and a clear tonal component exists in the frequency range from 20 to 250 hertz. Rule 012 does not define specific criteria for evaluating infrasound, which refers to sound that occurs in the frequency range from one to 20 hertz.

7.3 Noise models and discussion issues

269. RWDI developed two noise models for the project using the CadnaA software package version 2017, and in accordance with the ISO 9613-2 technical standard. One model was developed to generate predictions for the project NIA (RWDI NIA model),³⁴⁸ and the other model was developed in response to an undertaking given to Commission counsel during the hearing (RWDI updated model).³⁴⁹ Both the RWDI NIA model and the RWDI updated model were considered by the Commission when making its findings on noise.

270. dNCL developed two noise models in its written evidence and another model for Mr. de Haan's opening statement during the hearing. One of the written evidence models used the ISO 9613-2 standard (dNCL ISO model) and the other used the CONCAWE calculation method with Pasquill Class F (dNCL CONCAWE Class F model). Mr. de Haan's opening statement model used the CONCAWE calculation method with Pasquill Class E (dNCL CONCAWE Class E model). All three of dNCL's noise models were developed using the iNoise, version 2018 software package, and provided comparisons to the RWDI NIA model and the RWDI updated model.

³⁴⁷ CONCAWE, Report No. 4/81, page 25, paragraph 2.

³⁴⁸ Exhibit 22665-X0059.01, Attachment 8 - Noise Impact Assessment.

³⁴⁹ Exhibit 22665-X0273, Exhibit 273, noise undertaking.

271. The following table presents a comparison of the noise models developed by RWDI and dNCL:

Table 2. Comparison of the noise models developed by RWDI and dNCL

Comparison category	RWDI NIA model ³⁵⁰	RWDI updated model ³⁵¹	dNCL ISO model ³⁵²	dNCL CONCAWE Class F model ³⁵³	dNCL CONCAWE Class E model ³⁵⁴
Calculation standard and method	ISO 9613-2	ISO 9613-2	ISO 9613-2	CONCAWE method	CONCAWE method
Meteorological correction	Method: No meteorological correction Stability class: N/A Wind direction: downwind Wind speed: 1-5 m/s	Method: No meteorological correction Stability class: N/A Wind direction: downwind Wind speed: 1-5 m/s	Method: No meteorological correction Stability class: N/A Wind direction: downwind Wind speed: 1-5 m/s	Method: CONCAWE Stability class: F Wind direction: 315° Wind speed: 2 m/s	Method: CONCAWE Stability class: E Wind direction: 315° Wind speed: 3 m/s
Ground attenuation factor	0.7	0.5	0.5 - overall 0 - hard surface	0.5 - overall 0 - hard surface	0.5 - overall 0 - hard surface
Humidity	70%	70%	70%	70%	70%
Temperature	10°C	10°C	10°C	10°C	10°C
Terrain parameters	CDEM data at 5 metre resolution	CDEM data at 5 metre resolution	GeoGratis data at 5 metre resolution	GeoGratis data at 5 metre resolution	GeoGratis data at 5 metre resolution
Uncertainty	1 dBA additional uncertainty	No 1 dBA uncertainty	No 1 dBA uncertainty	No 1 dBA uncertainty	No 1 dBA uncertainty
Turbine emissions	based on the 12 m/s hub height wind speed	based on the 12 m/s hub height wind speed	based on the 20 m/s hub height wind speed	based on the 20 m/s hub height wind speed	based on the 20 m/s hub height wind speed
Receptor height	1.5 metres	1.5 metres / 4.5 metres	1.5 metres / 4.5 metres	1.5 metres / 4.5 metres	1.5 metres / 4.5 metres

272. The shaded column indicates the RWDI updated model, which EDP indicated would be more appropriate for the Commission to rely on than the results of the RWDI NIA model when making a decision about approval of the project.³⁵⁵

273. Major issues of debate related to the noise models used in this proceeding included the meteorological correction, ground attenuation factor and receptor height. In addition, the Clearview Group and Mr. de Haan expressed concerns about the identification of existing

³⁵⁰ Exhibit 22665-X0059.01, Attachment 8 - Noise Impact Assessment, page 9, Table 1, and page 19.

³⁵¹ Exhibit 22665-X0273, Exhibit 273, noise undertaking.

³⁵² Exhibit 22665-X0138, Tab 20 - Evidence of Henk de Haan dated April 17, 2018 re Noise Impacts, page 39, bullet 2, page 40, Table 4, and page 42.

³⁵³ Exhibit 22665-X0138, Tab 20 - Evidence of Henk de Haan dated April 17, 2018 re Noise Impacts, page 40, Table 4.

³⁵⁴ Exhibit 22665-X0283, Clearview Group Opening Statement of Henk de Haan, page 6, bullet iv.

³⁵⁵ Transcript, Volume 3, page 584, lines 5-7.

energy-related facilities, maximum sound power level for project wind turbines including RWDI's model uncertainty, and LFN and infrasound.

7.4 Views of EDP

The project NIA

274. The project NIA indicated that the project would use 83 Vestas V136 3.6-MW wind turbines. The sound power level for the project wind turbines was established using noise data provided by the turbine manufacturer, Vestas. The project NIA modelled a wind turbine sound power level of 105.5 dBA, which corresponded to noise emissions for a hub height wind speed of 12 metres/second (m/s)³⁵⁶ plus a 1 dBA uncertainty factor.

275. The project NIA also included the proposed Sedalia 363S Substation, which would consist of two 169-megavolt ampere transformers. The project NIA modelled the transformers as running continuously under Oil Natural Air Forced operating conditions. Sound power levels for the project substation were estimated through theoretical calculations based on electrical power ratings and the physical dimensions of the transformers.³⁵⁷

276. The project NIA identified 34 receptor locations: 32 occupied dwellings located within 1.5 kilometres of the project's wind turbines or substation, and two receptors representing the hamlets of Sedalia and New Brigden, which are located further than the 1.5-kilometre boundary from the project's wind turbines and substation.

277. Based on population density and proximity to transportation, the project NIA determined that PSL values of 40 dBA L_{eq} nighttime and 50 dBA L_{eq} daytime are applicable for all receptors, and the associated nighttime and daytime ASL values are 35 dBA L_{eq} and 45 dBA L_{eq} , respectively.

278. The project NIA included the noise contribution from 19 existing energy-related facilities that are located within three kilometres of receptors and that RWDI identified as potentially contributing to cumulative sound levels at these receptors: one proration battery, six large facilities (gas plants, gas gathering systems, and compressor stations) and 12 pumping well pads.

279. On September 22, 2017, RWDI completed a field study to measure noise from existing energy-related facilities. During this field study, noise was measured from two compressor stations, three gas plants, one gas gathering system and three well sites. The sound power levels used to represent existing facilities in the project NIA were established based on this field measurement data.

280. RWDI submitted that the ISO 9613-2 method used in the project NIA predicts sound levels under a moderately developed temperature inversion and downwind conditions.³⁵⁸

281. RWDI stated that the following conservative assumptions were used in the project NIA: (i) a 1 dBA uncertainty factor was added to the sound power level for project turbines; (ii) all

³⁵⁶ Exhibit 22665-X0059.01, Attachment 8 - Noise Impact Assessment, page 19.

³⁵⁷ Exhibit 22665-X0059.01, Attachment 8 - Noise Impact Assessment, page 21, Table 7.

³⁵⁸ Exhibit 22665-X0059.01, Attachment 8 - Noise Impact Assessment, page 9.

turbines were modelled with maximum sound output for the full 15-hour daytime and nine-hour nighttime periods; and (iii) each receptor was modelled downwind of each turbine at all times.³⁵⁹

282. The project NIA concluded that the project would comply with the PSLs defined in Rule 012.³⁶⁰ The project NIA stated that EDP would consider construction-generated noise in the project construction plans and throughout the construction process, and would follow the mitigation measures recommended in Rule 012 to manage any potential noise impacts due to construction activities on nearby dwellings.³⁶¹

Sound source identification

283. Two major issues associated with the identification of sound sources were discussed in the proceeding:

- Identification of third-party energy-related facilities with the potential to contribute to cumulative sound levels at receptors.
- Identification of the maximum sound power level, and associated spectrum, for the Vestas V136 3.6-MW wind turbine proposed for the project.

284. The project NIA stated that RWDI used the following publicly available databases to identify facilities that may contribute to cumulative sound levels at receptors: (i) Alberta Energy Regulator (AER) ST37 – Alberta well listing; (ii) AER ST102 – Alberta facility list; and (iii) National Pollutant Release Inventory Reporting Facilities.

285. RWDI explained that to identify the specific facilities that were modelled in the project NIA, it identified facility sites within three kilometres of receptors, filtered the data to focus on sites that were listed as operational, and identified noise generating facilities based on the type of operation listed in the databases.³⁶²

286. Ms. Drew testified that RWDI identified third-party facilities within three kilometres of receptors and emphasized that receptors were the focus when defining the search radius.³⁶³ Ms. Drew stated that:

a radius of 3 [kilometres] was sufficient to identify oil and gas well sites that could contribute 20 dBA at receptors and a screening for larger facilities is done separately to determine facilities for inclusion, based on a combination of size of facility and distance from receptors, but generally includes facilities within an additional 2 [kilometres] for a total of 5 [kilometres].³⁶⁴

³⁵⁹ Exhibit 22665-X0106, Information Response #3, EDP-AUC-2017DEC21-011, page 31.

³⁶⁰ Exhibit 22665-X0059.01, Attachment 8 - Noise Impact Assessment, page 29.

³⁶¹ Exhibit 22665-X0059.01, Attachment 8 - Noise Impact Assessment, page 29.

³⁶² Exhibit 22665-X0106, Information Response #3, EDP-AUC-2017DEC21-008, page 24.

³⁶³ Transcript, Volume 1, page 200, lines 7-9.

³⁶⁴ Exhibit 22665-X0200, Appendix B - Noise - SHWF Reply Evidence - RWDI, page 10.

287. RWDI then verified that all third-party facilities that were likely to contribute at least 20 dBA were captured.³⁶⁵ Ms. Drew testified that a noise contribution of 20 dBA or less would not cause a net increase for the predicted cumulative sound level at any given receptor.³⁶⁶ Ms. Drew explained that 20 dBA was set as a cut-off when filtering third-party facilities because adding 20 dBA would result in an increase of around one tenth of a decibel (i.e., 0.1 dB) above the 35 dBA nighttime ASL.³⁶⁷

288. The project NIA identified well sites that were described as pumping well pads in the AER ST37 well database, and modelled these pumping well pads as noise sources.³⁶⁸ Regarding well sites with other codes, RWDI commented that based on AER Directive 020: *Well Abandonment*, abandoned wells no longer produced, and had no active equipment, and had been permanently dismantled; and based on AER Directive 013: *Suspension Requirements for Wells*, suspended wells were previously active, had been inactive for at least 12 months, and had been suspended. RWDI also interpreted drilled and cased wells as wells that were either not yet producing or might not produce at all, so it would be unclear if and when the wells would have noise emitting equipment on them or if and when they would produce.³⁶⁹

289. RWDI explained that “[t]he nature of the Alberta noise regulation is that any suspended site that requires the start-up of new equipment must consider any existing or approved projects in the area. Accordingly, RWDI concluded that proposed oil and gas facilities must accommodate the Project, once approved, in their noise evaluations.”³⁷⁰

290. With regard to the AER ST102 database, RWDI stated “[f]acilities that are listed as operational are reviewed using satellite imagery to estimate the presence of equipment and then through a field program or discussion with site operators (where possible) sound emissions are characterized.”³⁷¹ RWDI stated that AER ST50 was not included in the project NIA because AER ST50 is a subset of AER ST102 and any significant noise source in AER ST50 would have been captured.³⁷²

291. During RWDI’s field study it measured three propane pumpjacks at well sites and used the loudest sound power level from these three pumpjacks to represent other pumping wells in the project NIA. RWDI stated that measurements were taken from fenceline perimeters and that a laser distance meter was used to determine the distance between measurement points and facility locations. The sound power levels of the third-party existing facilities that were modelled in the project NIA were established based on field measurement data.

292. When comparing the results of the field measurements conducted by RWDI and dNCL, RWDI opined that “a primary difference between the respective measurement programs appearing to be that [dNCL] was able to access two facilities where detailed measurements were obtained.”³⁷³ In addition, RWDI stated that “[w]hile there is variability in the types of equipment used on well sites in Alberta, it is RWDI’s opinion that the results of the [dNCL] survey

³⁶⁵ Transcript, Volume 2, page 440, lines 3-5.

³⁶⁶ Transcript, Volume 2, page 439, lines 16-25.

³⁶⁷ Transcript, Volume 2, page 440, lines 12-22.

³⁶⁸ Exhibit 22665-X0200, Appendix B - Noise - SHWF Reply Evidence - RWDI, page 12.

³⁶⁹ Exhibit 22665-X0106, Information Response #3, EDP-AUC-2017DEC21-008, page 25.

³⁷⁰ Exhibit 22665-X0129, SharpHills CVIR1 Response Document, page 49.

³⁷¹ Exhibit 22665-X0106, Information Response #3, EDP-AUC-2017DEC21-008, page 25.

³⁷² Exhibit 22665-X0200, Appendix B - Noise - SHWF Reply Evidence - RWDI, page 11.

³⁷³ Exhibit 22665-X0200, Appendix B - Noise - SHWF Reply Evidence - RWDI, page 13.

demonstrate that appropriate, and in some cases conservative, sound power levels were assigned to the third-party sources with potential to affect cumulative sound levels at receptors.”³⁷⁴

293. Based on acoustic specifications supplied by Vestas, RWDI stated that the project’s wind turbines would reach a maximum sound power level of 105.5 dBA at a hub height wind speed of 12 m/s.³⁷⁵ RWDI explained that the sound power level spectrum at 12 m/s was chosen to represent wind turbines in the project NIA because hub height wind speeds greater than 12 m/s occurred less than 10 per cent of the time based on wind statistics for the project area. Therefore, turbines operating at hub height wind speeds greater than 12 m/s should be considered non-representative conditions according to Rule 012.³⁷⁶ Furthermore, RWDI submitted that “[u]sing the 12 m/s hub height sound spectrum provides a conservative, representative operating condition, and [is] thus more likely to be field verifiable.”³⁷⁷

294. Ms. Drew testified that RWDI did not use the maximum low frequency content of 20 m/s because operation of the turbine at that hub height wind speed would occur less than one percent of the time.³⁷⁸

295. Ms. Drew further testified that EDP did not have a manufacturer guarantee for the sound power levels of the turbines when RWDI prepared the project NIA.

296. To address this lack of a guarantee, RWDI applied an uncertainty factor of 1 dBA when modelling the sound power level of the project wind turbines to ensure conservatism. To further stress that it was taking a conservative approach, RWDI explained in reply evidence that “no other practitioner besides Ms. Drew has used sound power uncertainty in Alberta based wind power NIAs that have been submitted to the AUC in a review of 28 AUC submitted NIAs.”³⁷⁹

297. Mr. LoTurco testified that EDP received a sound power level guarantee from the turbine manufacturer in the fall of 2017 but, before that time, EDP had already decided to model the project with the additional 1 dBA uncertainty factor.³⁸⁰ Furthermore, Mr. LoTurco testified that a sound power level guarantee meant that Vestas had conducted noise testing for the project wind turbines based on International Electrotechnical Commission standards and was very confident in the turbine sound power level and the associated spectrum.³⁸¹

Meteorological correction

298. RWDI used the ISO 9613-2 calculation standard in the project NIA’s noise modelling. RWDI stated that “[t]he ISO 9613[-2] sound propagation method predicts sound levels under moderately developed temperature inversion and downwind conditions, which enhance sound propagation to the receptor.”³⁸²

³⁷⁴ Exhibit 22665-X0200, Appendix B - Noise - SHWF Reply Evidence - RWDI, page 14.

³⁷⁵ Exhibit 22665-X0059.01, Attachment 8 - Noise Impact Assessment, page 19.

³⁷⁶ Exhibit 22665-X0200, Appendix B - Noise - SHWF Reply Evidence - RWDI, page 4.

³⁷⁷ Exhibit 22665-X0200, Appendix B - Noise - SHWF Reply Evidence - RWDI, page 5.

³⁷⁸ Transcript, Volume 1, page 196, lines 20-24.

³⁷⁹ Exhibit 22665-X0200, Appendix B - Noise - SHWF Reply Evidence - RWDI, page 6.

³⁸⁰ Transcript, Volume 2, page 433-343, lines 143.

³⁸¹ Transcript, Volume 2, page 435, lines 5-10.

³⁸² Exhibit 22665-X0059.01, Attachment 8 - Noise Impact Assessment, page 8.

299. RWDI submitted that the ISO 9613-2 standard was accepted in Rule 012, and in other jurisdictions around the world, that ISO 9613-2 was appropriately applied in the project NIA³⁸³ and that the use of the ISO 9613-2 standard provided valid, conservative results.³⁸⁴

300. Regarding the CONCAWE method used by dNCL, RWDI stated that the “[ISO 9613-2] and CONCAWE calculation methods are accepted in Rule 012, and the fact that one model may provide a higher prediction in some circumstances does not mean the other is not correct or valid.”³⁸⁵

301. In an information response regarding inverse or lapse conditions and stable weather conditions, RWDI submitted that meteorological conditions established in part 5 of ISO 9613-2 are equivalent to the stable Pasquill Stability Classes E, F and G, because “ISO 9613[-2] is valid for wind speeds between 1 and 5 m/s for heights of 3 [metres] to 11 [metres] and Pasquill [stability] classes E, F and G cover winds of 4.5 m/s and less at 10 [metres] height.”³⁸⁶

302. During the hearing, the topic of wind shear was discussed. Ms. Drew testified that, in the context of wind power projects, wind shear refers to a vertical wind speed gradient or difference between the wind speed at hub height and the wind speed on the ground.³⁸⁷ Ms. Drew explained the connection between wind shear, atmospheric stability and sound propagation and stated that “[s]table conditions are important because there’s less turbulence in the atmosphere, sound can travel farther, there’s less attenuation.” Ms. Drew also mentioned that ISO 9613-2 considered stable conditions.³⁸⁸ Furthermore, Ms. Drew testified that under stable conditions, a realistic worst-case condition would occur when ASLs were too low to hide or mask the sound from turbine operation.³⁸⁹ Ms. Drew testified that as defined in Rule 012, a representative condition meant a condition that occurred no less than 10 per cent of the time.³⁹⁰

Noise model settings and results

303. Noise model settings of ground attenuation factor and receptor height were also discussed at length in this proceeding.

304. RWDI used a general ground attenuation factor of 0.7 in the project NIA and the RWDI NIA model. This overall ground attenuation factor was applied to the entire modelling domain. RWDI stated that the ground attenuation factor of 0.7 was representative and appropriate.³⁹¹

305. Ms. Drew stated that “[g]round attenuation [...] is applied in the mathematics of the model when the sound is below 10 metres in height. It also is calculated based on three zones: a receptor zone, a middle zone, and a source zone.”³⁹² Ms. Drew compared the influence of these three zones in terms of the ground attenuation for an elevated source, such as a wind turbine, and

³⁸³ Exhibit 22665-X0200, Appendix B - Noise - SHWF Reply Evidence - RWDI, page 3, bullet v).

³⁸⁴ Exhibit 22665-X0200, Appendix B - Noise - SHWF Reply Evidence - RWDI, page 17.

³⁸⁵ Exhibit 22665-X0200, Appendix B - Noise - SHWF Reply Evidence - RWDI, page 3, bullet c.

³⁸⁶ Exhibit 22665-X0129, SharpHills CVIR1 Response Document, EDP-CLEARVIEW GROUP-2018MAR12-043, page 65.

³⁸⁷ Transcript, Volume 2, page 461, lines 4-10.

³⁸⁸ Transcript, Volume 2, page 462, lines 17-21.

³⁸⁹ Transcript, Volume 2, pages 462-463, lines 11-5.

³⁹⁰ Transcript, Volume 2, page 463, lines 19-21.

³⁹¹ Exhibit 22665-X0200, Appendix B - Noise - SHWF Reply Evidence - RWDI, page 3, bullet c.

³⁹² Transcript, Volume 3, page 586, lines 17-21.

for a source less than 10 metres above ground, such as the compressor station north of Sedalia. Ms. Drew suggested that:

- For a wind turbine, the middle zone is essentially not relevant since the source zone extends all the way to the receptor. In the case of a wind turbine, the receptor zone is the focus of the ground attenuation calculation.
- For a source less than 10 metres above ground, all three ground attenuation zones are relevant: source zone, middle zone, and receptor zone. Consequently, changes in ground attenuation will have a more profound impact on noise level predictions for ground based sources than elevated sources.³⁹³

306. RWDI provided comment on the use of mapped ground attenuation factors in combination with an overall ground attenuation factor in noise models. RWDI stated “the use of either general ground attenuation, or mapped ground attenuation approaches are acceptable, but not in combination. The combined approach leads to an overly conservative approach that is not representative of the experience in Alberta with wind farms.”³⁹⁴

307. RWDI stated that the RWDI NIA model used a receptor height of 1.5 metres for all dwellings. In addition, RWDI argued that “[t]he NIA is compliant with AUC Rule 012 requirements to use 1.5 [metres] receptor height, which is the relevant height for the mandated ambient sound level used in the cumulative assessment.”³⁹⁵ RWDI further argued that “RWDI recognizes that 4.5 [metres] may be used for post-construction monitoring in the event of a complaint if warranted. [...] RWDI is aware that some projects in Alberta have chosen to use second storey receptor heights at 4.5 [metres]. AUC Rule 012 does not require this receptor height.”³⁹⁶

308. RWDI re-ran the RWDI NIA model using a receptor height of 4.5 metres for the three two-storey receptors (R24, R35 and R36), and demonstrated that predicted sound levels at the two-storey receptors would comply with the PSL, even with the inclusion of a 1 dBA uncertainty factor on the turbine sound power level.³⁹⁷

309. In response to an undertaking given to Commission counsel, Ms. Drew re-ran the RWDI NIA model without the 1 dBA uncertainty factor, using a ground attenuation factor of 0.5 and a receptor height of 4.5 metres for two-storey dwellings, to create the RWDI updated model.

310. Ms. Drew argued that the addition of a 1 dBA uncertainty factor was equivalent to using a ground attenuation factor of 0.5 when modelling project noise levels. Ms. Drew emphasized that the project would comply with Rule 012 if RWDI used a ground attenuation factor of 0.5 and eliminated the 1 dBA uncertainty factor.³⁹⁸ In comparing the RWDI NIA model and the RWDI updated model, Ms. Drew explained that rather than adding conservatism into a model through use of a smaller ground attenuation factor, she focused the conservatism on the source

³⁹³ Transcript, Volume 3, pages 586-587, lines 22-10.

³⁹⁴ Exhibit 22665-X0200, Appendix B - Noise - SHWF Reply Evidence - RWDI, page 7.

³⁹⁵ Exhibit 22665-X0129, SharpHills CVIR1 Response Document, EDP-CLEARVIEW GROUP-2018MAR12-041, page 63.

³⁹⁶ Exhibit 22665-X0200, Appendix B - Noise - SHWF Reply Evidence - RWDI, page 8.

³⁹⁷ Exhibit 22665-X0200, Appendix B - Noise - SHWF Reply Evidence - RWDI, page 8.

³⁹⁸ Transcript, Volume 2, page 429, lines 12-21.

itself by applying 1 dBA uncertainty to the sound power level of the project wind turbines.³⁹⁹ In addition, RWDI compared the predicted cumulative sound levels from the RWDI NIA model and those from the RWDI updated model and demonstrated that there would be less than ± 0.3 dBA difference at all the receptors except R35 (hamlet of Sedalia). Receptor R35 would change by 0.8 dBA.⁴⁰⁰ Ms. Drew explained that the change of 0.8 dBA at R35 was due to the influence of a compressor station north of the dwellings and was “driven by the ground attenuation for the third parties.”⁴⁰¹

311. RWDI predicted PSL compliance at all the noise receptors (including the three two-storey receptors) in the RWDI updated model results.⁴⁰² Ms. Drew explained the RWDI updated model results were presented at whole number precision because “[t]he ambient [level] that we use and the PSL we compare to as defined in Rule 12 do not have any decimal places. They do not have significant digits. So we provide a cumulative number to compare on the same basis.”⁴⁰³

312. Ms. Drew confirmed that the Commission could rely on the results of the RWDI updated model because the sound power level of the project turbines has been guaranteed by Vestas.⁴⁰⁴ Mr. LoTurco testified that, when making a decision about approval of the project, it would be more appropriate for the Commission to rely on the results of the RWDI updated model than the results of the RWDI NIA model.⁴⁰⁵

Low frequency noise and infrasound

313. The project NIA evaluated the potential for LFN impacts from the project. First, the project NIA calculated dBC minus dBA for predicted project sound levels at the receptors. The results of this calculation showed that dBC minus dBA values would be greater than or equal to 20 dB at 33 out of 34 receptor locations. RWDI explained that the overall C-weighted levels are below the maximum value for dBC indicated by the Rule 012 method for LFN analysis. RWDI stated that Rule 012 allows a 20 dB difference from the PSL of 40 dBA, for a maximum of 60 dBC.⁴⁰⁶

314. Furthermore, the project NIA stated that “[t]he specification provided for the Vestas V136 3.6-MW turbine indicates that audible tonality will be within 3 dB when calculated according to IEC 61400-11 methods. A tonal audibility of 3 dB complies with tonality as determined in AUC Rule 012 Appendix 5. [references omitted]” Based on this LFN analysis, the project NIA stated that LFN effects are not expected at any receptors.⁴⁰⁷ The project NIA concluded that “[d]ue to the C-weighted values being below 60 dBC and the absence of tonal sound, the potential for LFN is considered to be low”.⁴⁰⁸

³⁹⁹ Transcript, Volume 2, page 430, lines 12-18.

⁴⁰⁰ Exhibit 22665-X0273, Exhibit 273.

⁴⁰¹ Transcript, Volume 3, page 586, lines 1-14.

⁴⁰² Exhibit 22665-X0273, Exhibit 273.

⁴⁰³ Transcript, Volume 3, page 583, lines 17-22.

⁴⁰⁴ Transcript, Volume 3, pages 620-621, lines 11-19.

⁴⁰⁵ Transcript, Volume 3, page 584, lines 5-7.

⁴⁰⁶ Exhibit 22665-X0059.01, Attachment 8 - Noise Impact Assessment, page 28.

⁴⁰⁷ Exhibit 22665-X0059.01, Attachment 8 - Noise Impact Assessment, page 29.

⁴⁰⁸ Exhibit 22665-X0059.01, Attachment 8 - Noise Impact Assessment, page 29.

315. RWDI also compared the project turbine's one-third octave spectra in the frequency range from six hertz to 10 kilohertz to comparable spectral data for other wind turbines in the recent AUC applications.⁴⁰⁹ RWDI stated that the comparison demonstrated that "while larger rotor diameters have slightly higher LFN, the impact is only a 4-dB spread between technologies." In addition, RWDI submitted that "the less than 4 dB difference across technologies in the LFN and available infrasound 1/3 octave band values does not change the conclusion that meeting the AUC Rule 012 PSL of 40 dBA will effectively limit potential for infrasound".⁴¹⁰

316. RWDI referred to Decision 3329-D01-2016⁴¹¹ and stated that "the Commission considered whether the A-weighted scale should be used to measure LFN and infrasound" and "[t]he Commission ultimately concluded that the A-weighted scale can be used to measure LFN and infrasound for the purposes of Rule 012 [...]".⁴¹² In addition, RWDI referred to the findings of a German government study of LFN and infrasound, which found that the level of infrasound caused by wind turbines was well below the limits of human perception at a distance of 150 metres and that adverse effects relating to infrasound from wind turbines could not be expected on the basis of the evidence at hand.⁴¹³

Other noise issues

317. RWDI stated that the 2017 version of CadnaA that it used for the RWDI NIA model and the RWDI updated model is certified under a certification standard for acoustic software called ISO/TR 17534-3. In response to questions on how noise software was certified in accordance with ISO 9613-2 under ISO/TR 17534-3, Ms. Drew testified that there was a standard for implementing ISO 9613-2 in modelling software, and that the certification process was intended to verify that a given software tool correctly calculated the ISO 9613-2 standard.⁴¹⁴ Ms. Drew added that having software certified provided greater confidence in the numbers.⁴¹⁵

318. Ms. Drew agreed that the RWDI updated model predicted that the cumulative sound levels at R14, R16, R17, R19, R25, R28, R29, R32 and R35 were closest to the nighttime PSL.⁴¹⁶ Ms. Drew testified that from a practice perspective, these nine receptors would be acceptable locations in the event that the Commission were to direct post-construction noise monitoring for the project. When asked to further clarify whether R35 (hamlet of Sedalia) would be an appropriate monitoring location, Ms. Drew answered "[y]es. [...] Because of the cumulative effects."⁴¹⁷ Ms. Drew commented that "the recommendation to do monitoring and where to do monitoring is really taken on a site-by-site basis and the degree of conservatism in the model and how the confidence in the source data going into the model."⁴¹⁸ In addition, she commented that

⁴⁰⁹ Exhibit 22665-X0200, Appendix B - Noise - SHWF Reply Evidence – RWDI, Attachment F, page 65.

⁴¹⁰ Exhibit 22665-X0200, Appendix B - Noise - SHWF Reply Evidence - RWDI, page 16.

⁴¹¹ Decision 3329-D01-2016: E.ON Climate & Renewables Canada Ltd. – Grizzly Bear Creek Wind Power Project, Proceeding 3329, Applications 1610717-1 and 1610717-2, May 19, 2016.

⁴¹² Exhibit 22665-X0129, SharpHills CVIR1 Response Document, EDP-CLEARVIEW GROUP-2018MAR12-029, page 43.

⁴¹³ Exhibit 22665-X0129, SharpHills CVIR1 Response Document, EDP-CLEARVIEW GROUP-2018MAR12-029, page 43.

⁴¹⁴ Transcript, Volume 2, pages 459-460, lines 18-6.

⁴¹⁵ Transcript, Volume 2, page 460, lines 21-23.

⁴¹⁶ Transcript, Volume 3, page 584, lines 17-24.

⁴¹⁷ Transcript, Volume 3, page 589, lines 1-8.

⁴¹⁸ Transcript, Volume 3, page 590, lines 3-7.

receptor locations approaching the nighttime PSL of 40 dBA would be important. She opined that the locations where the project turbines gave greater contribution than third-party facilities should be preferred, and that feasibility of the monitoring should be considered.⁴¹⁹

319. EDP argued that many of Mr. de Haan's criticisms of the project NIA should be rejected because they were overly conservative, unrealistic and further, did not align with the methodology he used when recently acting for a wind power developer in the Whitla Wind Project.⁴²⁰ EDP noted that the Whitla Wind Project NIA, which Mr. de Haan worked as a quality reviewer, used the ISO 9613-2 model, included third-party facilities only within three kilometres of the project area. Also, EDP noted that Mr. de Haan did not use a ground factor of zero for water bodies, tamped surfaces, and roads, which is contrary to the approach he has taken in modelling this project.

7.5 Views of the Clearview Group

dNCL noise models

320. dNCL developed the dNCL ISO model and the dNCL CONCAWE Class F model in its written evidence and the dNCL CONCAWE Class E model in Mr. de Haan's opening statement. Mr. de Haan conducted a field study of the project area in April 2018 to gain a first-hand impression of the project area, confirm the presence and sound power levels of third-party energy-related facilities, and verify the presence of two-storey dwellings in the study area.

321. The dNCL ISO model predicted that sound levels would exceed the PSL at six dwellings,⁴²¹ the dNCL CONCAWE Class F model predicted that sound levels would exceed the PSL at 11 dwellings⁴²² and the dNCL CONCAWE Class E model predicted that sound levels would exceed the PSL at five dwellings.⁴²³

Sound source identification

322. Mr. de Haan raised concerns with the third-party facilities selected for inclusion in the project NIA.

323. Mr. de Haan stated that the search radius used to identify third-party facilities for the project NIA was not clearly defined. Mr. de Haan noted it was ambiguous whether the search radius was three kilometres or 4.5 kilometres, because contradictory information was presented in different documents prepared by RWDI. In addition, Mr. de Haan pointed out that RWDI did not explain whether the search radius was defined from receptors or from project wind turbines.⁴²⁴ Mr. de Haan recommended 4.5 kilometres, centered on receptors, as an appropriate search radius for third-party facilities "because [third] party facilities within 4.5 [kilometres] from a receptor in the study area might affect the noise impact at that receptor."⁴²⁵ To justify the above recommendation, Mr. de Haan gave an example that a facility similar to the third-party

⁴¹⁹ Transcript, Volume 3, pages 590-591, lines 13-4.

⁴²⁰ Exhibit 22665-X0290, Reply Argument, page 4.

⁴²¹ Exhibit 22665-X0138, Tab 20 - Evidence of Henk de Haan dated April 17, 2018 re Noise Impacts, page 46.

⁴²² Exhibit 22665-X0138, Tab 20 - Evidence of Henk de Haan dated April 17, 2018 re Noise Impacts, page 46.

⁴²³ Exhibit 22665-X0283, Clearview Group Opening Statement of Henk de Haan, page 6.

⁴²⁴ Exhibit 22665-X0138, Tab 20 - Evidence of Henk de Haan dated April 17, 2018 re Noise Impacts, page 10.

⁴²⁵ Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-20, CG-AUC-2018MAY03-019, page 50.

facility identified as Sedalia 5-26-30-4W4, with a sound power level of 115 dBA, would result in a sound level of 20 dBA at a distance of 4.5 kilometres. Mr. de Haan further demonstrated that combining a 20 dBA facility contribution with an ASL of 35 dBA would result in a cumulative sound level of 35.2 dBA. Mr. de Haan considered this 0.2 dBA increase above the ASL to be of relevance when assessing noise impacts at receptors.⁴²⁶

324. Mr. de Haan acknowledged that RWDI used the AER ST37 and AER ST102 databases to identify third-party facilities; however, he contested that RWDI included data from AER ST50. Mr. de Haan was critical of RWDI's decision to only include currently pumping wells and exclude wells with codes, such as licensed, re-entered, issued, re-certified. Mr. de Haan stated that "[i]f wells with these codes become operational, their noise impact may lead to an exceedance of the PSL,"⁴²⁷ and suggested that "[a]ll facilities that might be active and might affect the noise impact should be included in the assessment on the basis of a field study."⁴²⁸

325. After reviewing the notes for the field study conducted by RWDI,⁴²⁹ Mr. de Haan expressed concerns with the distance at which noise measurements were collected. He recommended that noise sources be measured at a distance sufficiently large that the source can be treated as a mathematical point.⁴³⁰ Mr. de Haan focused on field measurements at a gas plant identified in the RWDI field notes as Sedalia 9-29-31-5-GP. Mr. de Haan observed the photos that RWDI provided for this gas plant and suggested that a number of potential sound sources were present at the facility location. Mr. de Haan expressed concerns that RWDI characterized this complicated facility using a single measurement and recommended "either a series of measurements around the fenceline of the facility, or measurements at a distance sufficient to consider the facility a single point source."⁴³¹

326. Mr. de Haan also compared the predicted noise contribution from third-party facilities in RWDI's initial NIA and the project NIA and noted that the noise contribution from third-party facilities had decreased at most receptors. Mr. de Haan was concerned that RWDI did not include the highest measurement results or explain the decrease of third-party noise contribution between the two NIA reports.⁴³²

327. Mr. de Haan measured six third-party facilities during his field study and his sound power levels were established based on these field measurements. Mr. de Haan compared the sound power levels that he established to the sound power levels used in the project NIA. For the facility identified as Baytex Sedalia 09-29-31-05-W4, Mr. de Haan determined that the sound power levels he established were comparable to the sound power levels established by RWDI. For all other facilities, Mr. de Haan determined that the method used to establish sound power levels in the project NIA might underestimate or overestimate actual noise emissions and therefore there were substantial differences between the noise emissions predicted by Mr. de Haan's and those predicted by RWDI.⁴³³

⁴²⁶ Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-20, CG-AUC-2018MAY03-019, page 50.

⁴²⁷ Exhibit 22665-X0138, Tab 20 - Evidence of Henk de Haan dated April 17, 2018 re Noise Impacts, page 14.

⁴²⁸ Exhibit 22665-X0138, Tab 20 - Evidence of Henk de Haan dated April 17, 2018 re Noise Impacts, page 14.

⁴²⁹ Exhibit 22665-X0124, Attachment CVIR1-034-01 - Field Data.

⁴³⁰ Exhibit 22665-X0138, Tab 20 - Evidence of Henk de Haan dated April 17, 2018 re Noise Impacts, page 16.

⁴³¹ Exhibit 22665-X0138, Tab 20 - Evidence of Henk de Haan dated April 17, 2018 re Noise Impacts, page 18.

⁴³² Exhibit 22665-X0138, Tab 20 - Evidence of Henk de Haan dated April 17, 2018 re Noise Impacts, page 21.

⁴³³ Exhibit 22665-X0177, CG Information Request Response to CG-AUC-2018MAY03-021(b), page 5.

328. Mr. de Haan was critical of RWDI's use of the sound power level for a hub height wind speed of 12 m/s to model the project wind turbines, rather than the sound power level for a maximum hub height wind speed of 20 m/s. He pointed out that the overall sound power levels for hub height wind speeds of 12 m/s and 20 m/s were the same, 105.5 dBA, but the spectrum was different. Mr. de Haan noted that the 20 m/s sound power level spectrum had slightly more sound energy in the low frequency bands than the 12 m/s sound power level spectrum used in the project NIA.⁴³⁴

Meteorological correction

329. Mr. de Haan discussed how the CONCAWE method could be used to adjust the meteorological correction in noise model calculations, and submitted that meteorological conditions other than mild downwind (i.e., default ISO 9613-2 conditions) could be accounted for using the CONCAWE method. Mr. de Haan explained that the CONCAWE method applied a meteorological correction to noise level predictions based on Pasquill Stability Class, wind speed and wind direction.⁴³⁵ Mr. de Haan testified that "since the ISO 9613[-2] method doesn't accurately represent the noise impact on the stable atmospheric conditions, we included calculations using CONCAWE to represent those stable atmospheric conditions."⁴³⁶

330. Mr. de Haan discussed the Pasquill Stability Classes and testified that "Class A is the most unstable one and Class G is the most stable one."⁴³⁷ In addition, Mr. de Haan commented that "noise propagates well, very well on stable conditions and less well under unstable conditions."⁴³⁸

331. Mr. de Haan conducted a case study and performed test calculations to illustrate the difference between sound levels predicted according to ISO 9613-2 and according to the CONCAWE method. He submitted that predicted sound levels under more stable atmospheric conditions could be significantly higher than sound levels predicted based on ISO 9613-2.⁴³⁹ In addition, Mr. de Haan stated "ISO 9613[-2] is only equivalent to CONCAWE for stability classes A-C (unstable daytime conditions), and not for classes D-G (neutral – extremely stable nighttime conditions) for the conditions included in the test case."⁴⁴⁰

332. Mr. de Haan presented results from a paper that indicated that stable atmospheric conditions occurred in the Pincher Creek area more than 10 per cent of the time during summer nighttime hours and indicated that they should be accounted for, pursuant to Rule 012.⁴⁴¹ However, the Clearview Group also stated that "[i]t is not known to the Clearview Group how frequently these conditions occur in the study area [for the project]".⁴⁴² Further, in response to an information request about the meteorological method used in the dNCL CONCAWE F model, Mr. de Haan stated that "[t]he scenario was included as an example of what the noise impact

⁴³⁴ Exhibit 22665-X0138, Tab 20 - Evidence of Henk de Haan dated April 17, 2018 re Noise Impacts, page 11.

⁴³⁵ Exhibit 22665-X0138, Tab 20 - Evidence of Henk de Haan dated April 17, 2018 re Noise Impacts, page 26.

⁴³⁶ Transcript, Volume 5, page 1118, lines 5-9.

⁴³⁷ Transcript, Volume 5, pages 1137-1138, lines 24-2.

⁴³⁸ Transcript, Volume 5, page 1138, lines 3-5.

⁴³⁹ Exhibit 22665-X0138, Tab 20 - Evidence of Henk de Haan dated April 17, 2018 re Noise Impacts, page 28.

⁴⁴⁰ Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-20, page 40.

⁴⁴¹ Exhibit 22665-X0138, Tab 20 - Evidence of Henk de Haan dated April 17, 2018 re Noise Impacts, page 29.

⁴⁴² Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-20, page 44.

could be under stable atmospheric conditions. It is not known to the interveners exactly how applicable these settings are to the study area, or how representative they are for weather conditions in the study area.”⁴⁴³

333. Mr. de Haan acknowledged that ISO 9613-2 is identified in Rule 012 as an acceptable international standard and that downwind conditions and mild inverse conditions are included in this standard. However, Mr. de Haan also stated that under other conditions than those included in the standard, such as upwind, or with a stable atmosphere, propagation may differ and result in a lower noise impact (for upwind) or higher noise impact (for stable atmospheric conditions).⁴⁴⁴

334. Mr. de Haan acknowledged that ISO 9613-2 was widely used; however, he was concerned about the applicability of ISO 9613-2 to large wind turbines, such as those proposed for the project. In addition, Mr. de Haan stated that “we, the international community of acoustical practitioners, have been able to use ISO 9613 and -- in a good way, and it’s proven to be good for downwind conditions, provided we fiddle with the settings in the model.”⁴⁴⁵

335. Mr. de Haan testified that “ISO 9613[-2] is intended to provide a long-term average noise impact. And long term could mean average over a year.” In addition, Mr. de Haan commented that using ISO 9613-2 with average meteorological conditions or conditions based on statistical weather patterns can provide a long-term average noise impact.⁴⁴⁶

336. Mr. de Haan clarified that CONCAWE is a supplemental method, and the calculation procedure used in CONCAWE noise models is consistent with ISO 9613-2, except that a meteorological correction is added.⁴⁴⁷

337. Mr. de Haan observed that RWDI stated that atmospheric stability Class E would be representative for the propagation conditions in the study area. As a result, Mr. de Haan developed the dNCL CONCAWE Class E model using the CONCAWE meteorological correction for stability Class E, wind direction 315 degrees, and wind speed 3 m/s.⁴⁴⁸ Mr. de Haan stated that the dNCL CONCAWE Class E model was representative of atmospheric conditions in the project area.⁴⁴⁹

338. Mr. de Haan testified that the wind speed in the CONCAWE meteorological correction was defined at a level close to the ground, however, wind conditions could be different at turbine hub height.⁴⁵⁰ Regarding the concept of wind shear, Mr. de Haan explained that it is the difference in wind speed measured at different heights. When describing the connection between wind shear and atmospheric stability, Mr. de Haan explained that when conditions are unstable,

⁴⁴³ Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-20, page 42.

⁴⁴⁴ Exhibit 22665-X0138, Tab 20 - Evidence of Henk de Haan dated April 17, 2018 re Noise Impacts, page 31.

⁴⁴⁵ Transcript, Volume 5, page 1047, lines 7-18.

⁴⁴⁶ Transcript, Volume 5, page 1143, lines 19-24.

⁴⁴⁷ Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-20, page 46.

⁴⁴⁸ Exhibit 22665-X0283, Clearview Group Opening Statement of Henk de Haan, page 6.

⁴⁴⁹ Transcript, Volume 5, page 1147, lines 17-22.

⁴⁵⁰ Transcript, Volume 5, page 1141, lines 8-17.

there is no predictable correlation between the wind speed at receptor height and the wind speed at hub height.⁴⁵¹

339. Mr. de Haan testified that representative conditions, in the context of Rule 012, meant conditions that occurred more than 10 per cent of the time during a particular season. He stated that compliance with Rule 012 should be established for the highest predicted sound level under any representative condition.⁴⁵²

Noise modelling settings and results

340. Mr. de Haan also raised concerns with the ground attenuation factor and receptor heights used in the project NIA.

341. Mr. de Haan stated that it was overly optimistic of RWDI to use an overall ground attenuation factor of 0.7 for the project NIA and to avoid modelling water bodies, roads and other reflective surfaces separately with an appropriate ground factor. dNCL recommended that a ground factor of 0.5 be used in noise assessments for wind power projects. Mr. de Haan referenced two examples to support his recommendation: Section 7.5.3 of Decision 3329-D01-2016,⁴⁵³ and an NIA report prepared by RWDI for the Suncor Forty Mile Wind Power Project. Mr. de Haan also mentioned that a book titled *Wind Turbine Noise* recommended a ground factor of less than 0.5 or a ground factor of zero be used when modelling wind turbine noise.⁴⁵⁴

342. Mr. de Haan recommended that reflective surfaces located near receptors and third-party facilities should be considered separately with appropriate local ground factors.⁴⁵⁵ To support this recommendation, Mr. de Haan compared modelling results to measured sound levels for a third-party facility identified as Baytex Sedalia 09-29-31-05-W4. Mr. de Haan developed two models as part of this comparison. One model, Variant A, used a ground factor of zero for the facility pad and roads and a ground factor of one for the rest of the modelling domain. The other model, Variant B, used an overall ground factor of 0.7. Mr. de Haan found that Variant A matched the measured sound level, but Variant B underestimated the sound level.⁴⁵⁶

343. During his field study, Mr. de Haan identified two dwellings that were not included in the project NIA. Mr. de Haan showed that these two dwellings were located about two kilometres and 1.57 kilometres from the closest project wind turbine.⁴⁵⁷ Mr. de Haan stated that these dwellings may be of interest because of their location between several rows of turbines.⁴⁵⁸

344. Mr. de Haan raised concerns that a receptor height of 1.5 metres did not account for the second floor of two-storey dwellings, where bedrooms would typically be situated and residents would be impacted by nighttime noise. Mr. de Haan confirmed the presence of two-storey dwellings in the project area during his field study and submitted that noise receptors R24,

⁴⁵¹ Transcript, Volume 5, page 1151-1152, lines 11-10.

⁴⁵² Transcript, Volume 5, page 1153-1154, lines 5-25.

⁴⁵³ Decision 3329-D01-2016: E.ON Climate & Renewables Canada Ltd. Grizzly Bear Creek Wind Power Project, Proceeding 3329, Applications 1610717-1 and 1610717-2, May 19, 2016.

⁴⁵⁴ Exhibit 22665-X0138, Tab 20 - Evidence of Henk de Haan dated April 17, 2018 re Noise Impacts, page 36.

⁴⁵⁵ Exhibit 22665-X0138, Tab 20 - Evidence of Henk de Haan dated April 17, 2018 re Noise Impacts, page 36.

⁴⁵⁶ Exhibit 22665-X0177, CG Information Request Response to CG-AUC-2018MAY03-021(b), pages 5-6.

⁴⁵⁷ Exhibit 22665-X0177, CG Information Request Response to CG-AUC-2018MAY03-021(b), page 11, Table 5.

⁴⁵⁸ Exhibit 22665-X0177, CG Information Request Response to CG-AUC-2018MAY03-021(b), page 11.

R35 (Sedalia) and R36 (New Brigden) were two-storey dwellings.⁴⁵⁹ Mr. de Haan suggested that the second floor of a two-storey dwelling would typically experience greater noise impacts than the ground floor. Mr. de Haan stated that Rule 012 included a specific obligation for wind turbine operators to assess the second storey in case of a complaint. He also listed several recent Commission applications that used a receptor height of 4.5 metres for two-storey dwellings. Mr. de Haan recommended that a receptor height representative of the second floor should be used to model two-storey dwellings.⁴⁶⁰

Low frequency noise and infrasound

345. Mr. de Haan conducted a literature review on the evaluation of LFN and infrasound issues for wind turbines. Mr. de Haan submitted that most peer-reviewed studies concluded that the levels of LFN and infrasound at relevant distances from wind turbines were well below the threshold of human hearing. However, Mr. de Haan noted that “with increasing size of the turbine the noise emission spectrum shifts downward”.⁴⁶¹ Mr. de Haan also noted that a recent article found wind farm infrasound and LFN in excess of the audibility threshold indoors at distances up to four kilometres from a wind farm, and that wind farm LFN and infrasound levels could undergo large variations in magnitude over time.⁴⁶²

346. Given the height and size of the project’s turbines, Mr. de Haan emphasized that potential LFN and infrasound issues might be greater for the project’s turbines than for other previously studied ones.⁴⁶³ Mr. de Haan stated that there was no information provided in the application to assess whether or not the proposed turbines generate significant amounts of infrasound. However, Mr. de Haan concluded that with increased size of the turbines, the sound power level spectrum would shift to lower frequencies.⁴⁶⁴

Other noise issues

347. dNCL’s three noise models were developed using the Enterprise version of iNoise. Mr. de Haan stated that the iNoise software suite is applicable to noise predictions according to ISO 9613-2 and it is quality assured noise prediction software according to standard ISO/TR 17534-3.⁴⁶⁵ Mr. de Haan also stated that “the meteorological correction according to CONCAWE is not included in standard ISO/TR 17534-3.”⁴⁶⁶

348. Mr. de Haan commented on the difference between prediction results from iNoise and other widely recognized noise modelling software. Mr. de Haan stated that “[f]or a model

⁴⁵⁹ Exhibit 22665-X0177, CG Information Request Response to CG-AUC-2018MAY03-021(b), page 10.

⁴⁶⁰ Exhibit 22665-X0138, Tab 20 - Evidence of Henk de Haan dated April 17, 2018 re Noise Impacts, page 38.

⁴⁶¹ Exhibit 22665-X0138, Tab 20 - Evidence of Henk de Haan dated April 17, 2018 re Noise Impacts, page 25.

⁴⁶² Exhibit 22665-X0138, Tab 20 - Evidence of Henk de Haan dated April 17, 2018 re Noise Impacts, page 25.

⁴⁶³ Exhibit 22665-X0138, Tab 20 - Evidence of Henk de Haan dated April 17, 2018 re Noise Impacts, page 26.

⁴⁶⁴ Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-20, page 55.

⁴⁶⁵ Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-20, page 46.

⁴⁶⁶ Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-20, page 46.

according to ISO 9613-2, no differences are expected between Predictor and iNoise; both are certified according to ISO/TR 17534-3. They also share the same calculation core.”⁴⁶⁷

349. Mr. de Haan was questioned about whether he had any recommendations for resolving potential noise issues at the five dwellings where the dNCL CONCAWE Class E model predicted cumulative noise levels in excess of the nighttime PSL. Mr. de Haan responded that he did not have any solution other than “refusing the application.”⁴⁶⁸ In particular, Mr. de Haan did not recommend a post-construction monitoring program to verify compliance with Rule 012 at these five dwellings, or at any other dwellings in the project area. In addition, Mr. de Haan explained that he had no information to analyze which specific turbines were responsible for the exceedance, so he could not recommend turbine-specific operating restrictions to resolve potential noise issues.⁴⁶⁹

350. Although, Mr. de Haan argued against a post-construction noise monitoring program to verify project noise compliance, he submitted that if there was such a program, “at least New Brigden and Sedalia should be included and potentially some other receptors that are close to the PSL.”⁴⁷⁰

7.6 Commission findings

The project NIA and the dNCL noise models

351. The purpose of an NIA is to provide reasonable predictions of the sound levels that may be experienced at nearby residences once the proposed project is in operation. In this proceeding, the Clearview Group raised a number of concerns with the NIA conducted for the project, including disputing the reasonableness of the predictions made by RWDI with respect to the expected noise impact of the project.

352. In this section, the Commission considers whether the project NIA was conducted in accordance with Rule 012 requirements, including RWDI’s NIA model and RWDI updated model. The Commission has considered whether sound sources were properly identified, whether meteorological conditions were appropriately considered and whether the noise model settings and predicted results were reasonable.

Sound source identification

353. With respect to the Clearview Group’s concerns with the project NIA’s identification of third-party facilities, the Commission considers that RWDI’s use of publicly accessible databases to identify third-party energy-related facilities was reasonable, and that a three-kilometre search radius is sufficient to satisfy Rule 012 requirements. Taking into account RWDI’s explanation for its use of a 20 dBA noise contribution cut-off for including third-party energy-related facilities, the Commission is not convinced that a 4.5-kilometre search radius was necessary to properly assess the expected noise contributions from third-party energy-related facilities, as proposed by Mr. de Haan.

⁴⁶⁷ Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-20, page 46.

⁴⁶⁸ Transcript, Volume 5, page 1167, lines 14-19.

⁴⁶⁹ Transcript, Volume 5, page 1168, lines 11-15.

⁴⁷⁰ Transcript, Volume 5, page 1152, lines 17-20.

354. With respect to the well types inputted in the project NIA, the Commission finds that RWDI's use of only the pumping AER ST37 well type was reasonable, considering the uncertainty surrounding when, or whether, other well types would be in operation as noise emitting sources. The Commission considers that it would be overly conservative to assume that all facilities/wells listed in publicly available databases are noise emitting sources or may become noise emitting sources in the future.

355. With respect to the adequacy of field measurements, the Commission recognizes that RWDI's field measurements were constrained by the accessibility of third-party facilities. The Commission finds it reasonable that field measurements collected at the same facility on different days may produce similar, but not identical, results. As such, the Commission finds that RWDI's field measurements and associated determination of sound power levels for third-party facilities are reasonable.

356. Overall, the Commission finds that RWDI's approach to identifying and filtering third-party energy-related facilities was reasonable and consistent with Rule 012.

357. With respect to the identification of the maximum sound power level and spectrum for the project wind turbines, Rule 012 requires:

[...] the sound power level from a wind turbine must correspond to the maximum noise emitted when the wind turbine operates under the planned maximum operating conditions for both the daytime and nighttime period. These operating conditions and restrictions to one or more wind turbines must be documented in the noise impact assessment.⁴⁷¹

358. The Commission finds that RWDI's use of wind statistics as a basis for modelling the turbine sound power level spectrum for a hub height wind speed of 12 m/s is not consistent with the requirements of Rule 012. Rule 012 requires modelling to reflect maximum turbine noise emissions, regardless of how often these emissions occur. The Commission considers that the selection of a maximum sound power level and spectrum should depend on the available manufacturer data for the wind turbine, not on wind statistics or representative weather conditions for the project area. Regardless of whether hub height wind speeds of 20 m/s occur less than 10 per cent of the time in the project area, the project NIA should include the 20 m/s turbine emissions data from the project NIA.

359. The Commission notes that the overall sound power level of the project wind turbines is 105.5 dBA, for hub height wind speeds of either 12 m/s or 20 m/s. In addition, 105.5 dBA is the maximum sound power level for the project wind turbine. Although the spectra for the 12 m/s and 20 m/s sound power levels are slightly different, the Commission notes that the difference between sound power levels in each octave band from 31.5 hertz to 4,000 hertz is no more than ± 0.5 dBA. As such, the Commission finds that the sound power levels for either 12 m/s or 20 m/s hub height wind speeds can be considered "the planned maximum operating conditions" for the project wind turbines, in accordance with Rule 012 requirements. As a result, in this case RWDI's use of a hub height speed of 12 m/s did not change the analysis or results of the project NIA.

⁴⁷¹ Rule 012: *Noise Control*, Effective on July 4, 2017, page 16, section 3.3 (1).

Meteorological correction

360. With respect to Mr. de Haan's concerns with the meteorological conditions for the project area and the model used in the project NIA, the Commission notes that the ISO 9613-2 standard is identified as acceptable in Rule 012, and that both Ms. Drew and Mr. de Haan acknowledged that ISO 9613-2 has been widely used and accepted "worldwide by other jurisdictions"⁴⁷² and among the "international community of acoustical practitioners."⁴⁷³

361. The Commission accepts RWDI's explanation that ISO 9613-2 reflects average values for meteorological conditions that are moderately favourable for sound propagation, and the ISO 9613-2 sound propagation method predicts sound levels under downwind conditions, which enhance sound propagation to the receptor.⁴⁷⁴ The Commission notes that ISO 9613-2 explicitly states that "[t]he method predicts the equivalent continuous A-weighted sound pressure level (as described in parts 1 to 3 of ISO 1996) under meteorological conditions favourable to propagation from sources of known sound emission."⁴⁷⁵ In particular, ISO 9613-2 models "downwind propagation, ... or, equivalently, propagation under a well-developed moderate ground-based temperature inversion, such as commonly occurs at night."⁴⁷⁶

362. Regarding the CONCAWE method, the Commission acknowledges that it allows noise modellers to account for the influence of wind (including wind direction and wind speed) and the stability of the atmosphere. The Commission understands that CONCAWE is a supplemental modelling method that deals with meteorological corrections.⁴⁷⁷

363. The Commission recognizes that meteorological corrections using the CONCAWE method in a predictive model can result in higher sound levels than a model using ISO 9613-2 alone. However, the Commission agrees with RWDI that simply because one model may provide a higher prediction in some circumstances, this does not mean the other is incorrect or invalid.⁴⁷⁸ The Commission also recognizes that it is possible to model a set of propagation conditions that would be more conservative than ISO 9613-2. For example, a very stable atmospheric condition or a very strong temperature inversion could bend more noise back to ground level than the default ISO 9613-2 conditions, resulting in higher sound levels than would be predicted by ISO 9613-2. In other words, ISO 9613-2 is conservative but that does not guarantee that it predicts the highest possible noise levels for all propagation conditions.

364. The Commission notes that Mr. de Haan's case study was conducted to compare sound levels as predicted using ISO 9613-2 and the CONCAWE method. However, the Commission finds that the case study was constructed specifically for comparison purposes and the results may not be universally applicable.

⁴⁷² Exhibit 22665-X0200, Appendix B - Noise - SHWF Reply Evidence - RWDI, page 17.

⁴⁷³ Transcript, Volume 5, page 1047, lines 7-18.

⁴⁷⁴ Exhibit 22665-X0059.01, Attachment 8 - Noise Impact Assessment, page 8.

⁴⁷⁵ ISO 9613-2, First edition 1996-12-15, Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation, page 4.

⁴⁷⁶ ISO 9613-2, First edition 1996-12-15, Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation, page 4.

⁴⁷⁷ Exhibit 22665-X0179, CG Information Requests Response to AUC (CG-AUC-2018MAY03-001 to CG-AUC-20, page 46.

⁴⁷⁸ Exhibit 22665-X0200, Appendix B - Noise - SHWF Reply Evidence - RWDI, page 3.

365. The meaning of representative conditions was discussed at length in this proceeding. Rule 012 defines representative conditions as follows: “[f]or ambient sound levels, these are conditions that portray the typical activities for the area, not an unusually quiet time (nonfrequent occurrence – less than 10 per cent of the time for a particular season).”⁴⁷⁹ The definition of representative conditions presented in Rule 012 is focused on ambient sound level surveys and not predictive modelling.

366. The Commission finds that noise modelling based on ISO 9613-2 satisfies the requirements of Rule 012. The Commission recognizes that ISO 9613-2 predicts the A-weighted sound pressure level under meteorological conditions favourable to sound propagation, and noise modelling based on ISO 9613-2 is conservative relative to general propagation conditions. Neither dNCL nor the Clearview Group presented compelling evidence that weather conditions in the project area, including wind shear and atmospheric stability, would result in representative propagation conditions that are more conservative than those modelled in ISO 9613-2.

367. In summary, the Commission accepts the noise modelling based on ISO 9613-2 presented in the project NIA. The Commission finds that use of the CONCAWE meteorological correction is not necessary unless there is compelling evidence that propagation conditions more conservative than those considered in ISO 9613-2 are representative of conditions in the project area. The Commission accordingly considers that the noise modelling in the project NIA was reasonable and in accordance with Rule 012.

Noise modelling settings and results

368. During the hearing, the results of the RWDI updated model were submitted to the Commission. With a change in the ground attenuation factor from 0.7 to 0.5 and removal of the 1 dBA uncertainty factor, the Commission finds that the results of the RWDI updated model to be an improvement over the original model in the NIA for the reasons that follow.

369. The Commission notes that EDP testified at the hearing that it would be more appropriate for the Commission to rely on the results of the RWDI updated model than the RWDI NIA model when making a decision about project compliance. The Commission finds that the parameter settings employed in the RWDI updated model are reasonable and the noise model inputs, which include sound power levels for third-party facilities and project turbines, are acceptable. The Commission finds that noise model results based on the RWDI updated model are reasonable for the purpose of assessing noise impacts from the project. Appendix G of this decision summarizes the predicted nighttime cumulative noise levels based on the RWDI updated model.

370. The Commission finds that the ground surface in the project area is reasonably uniform and there are no substantially large water bodies adjacent to the sound sources or receptors. As such, the Commission considers that the use of one overall ground attenuation factor of 0.7 in the noise modelling for this specific project area is an acceptable approach. Further, the Commission considers the use of an attenuation factor of 0.5 to be a reasonably conservative representation of ground conditions in the project area. Additionally, the Commission notes that dNCL used an overall ground factor of 0.5 in all three of the models that Mr. de Haan developed for this proceeding.

⁴⁷⁹ Rule 012: *Noise Control*, Effective on July 4, 2017, page 37.

371. The Commission acknowledges RWDI's effort to ensure conservatism by adding a 1 dBA uncertainty factor to the sound power level of the project wind turbines when a sound level guarantee was unavailable. However, the Commission does not agree with RWDI's claim that adding additional uncertainty to the turbine noise emissions necessarily makes up for a lack of conservatism in the modelled ground attenuation factor. Sound power level is a modelling input that represents noise source emissions, while ground attenuation factor is a modelling parameter that impacts the propagation calculation. Model conservatism with respect to source emissions is not equivalent to model conservatism with respect to propagation conditions. The Commission does not accept that there is a clear relationship between these two sources of conservatism in the noise modelling. Although RWDI found similar results when comparing predicted noise levels with a ground factor of 0.7 and a 1 dBA uncertainty on turbine emissions to predicted noise levels with a ground factor of 0.5 and without a 1 dBA uncertainty on turbine emissions, the Commission is not convinced that this constitutes evidence of a correlation between the two approaches to conservatism.

372. Mr. de Haan identified two dwellings that were not included in the project NIA, however, the two dwellings are located approximately two kilometres and 1.57 kilometres, respectively, from the closest turbine. Given their distance from project turbines, the Commission does not consider it necessary for EDP to have included these two dwellings in the project NIA. The Commission finds that noise compliance has been assessed at all receptors within 1.5 kilometres from the project turbines, which satisfies the requirements of Rule 012.

373. Rule 012 does not explicitly define receptor heights for noise modelling in an NIA, which was acknowledged by both Ms. Drew and Mr. de Haan. However, Rule 012 specifies microphone height for noise monitoring as "1.5 [metres] above ground" and "[i]f applicable, 4.5 [metres] above ground in complaint situation (i.e. nighttime complaint with second storey bedroom)".⁴⁸⁰

374. The Commission acknowledges that it would be more accurate to model a two-storey dwelling using a receptor at 4.5 metres above ground than a receptor at 1.5 metres above ground, since compliance measurements at this type of dwelling would have to be collected at a height of 4.5 metres. The Commission notes that the RWDI updated model used a receptor height of 1.5 metres for one-storey dwellings and a receptor height of 4.5 metres for two-storey dwellings. Based on the results of the RWDI updated model, the Commission is satisfied that RWDI has accurately modelled the noise impact for these two story dwellings. In any event, the Commission notes that the difference between predicted sound levels using 1.5-metre and 4.5-metre receptors is not significant enough to render the project non-compliant with Rule 012.

375. The Commission finds that the RWDI updated model results, as summarized in Appendix G to this decision, reasonably predicts that the project will be compliant with the PSL at all receptor locations. The Commission notes that the original conclusion in the project NIA, using the RWDI NIA model, was also that the project will be compliant with the PSL at all receptor locations. Although the two models used different inputs and parameters, the results of the analysis in both cases are compliant with Rule 012. The Commission accordingly concludes that the predicted sound levels for the project are expected to comply with the PSL.

⁴⁸⁰ Rule 012: *Noise Control*, Effective on July 4, 2017, page, 23, Table 5.

Low frequency noise and infrasound

376. The Commission acknowledges that wind turbines may produce infrasound; however, the Commission finds that there was no evidence presented in this proceeding to suggest that infrasound produced by the proposed project wind turbines will be detected by the residents of nearby dwellings or otherwise impact nearby residents.

377. With respect to the LFN analysis in the project NIA, there are two criteria to the Rule 012 test for whether an LFN condition may exist: the results of the time-weighted average dBC minus dBA value for the measured daytime or nighttime period must be equal to or greater than 20 dB, and a clear tonal component between 20 hertz and 250 hertz must exist. Rule 012 requires that both criteria (i.e., a dBC minus dBA difference greater than or equal to 20 dB *and* a clear tone at or below 250 hertz) be fulfilled for an LFN issue to potentially exist. Satisfying only one criterion does not result in a finding that LFN is present.

378. The project NIA established that dBC minus dBA values would be greater than or equal to 20 dB at 33 out of 34 receptor locations. The Commission accordingly finds that the first criterion of the LFN test is satisfied.

379. With respect to the second criterion of the LFN test, the Commission finds that RWDI conducted reasonable analysis of the one-third octave spectra supplied by the turbine manufacturer to determine the presence of LFN tonality. Based on this analysis, RWDI concluded that there is no tonal component present in the turbine emissions spectra. As a result, the Commission finds the second criterion of the test for identifying a LFN condition has not been satisfied.

380. Accordingly, the Commission finds that the Rule 012 test for determining whether a potential LFN condition exists has been adequately examined. RWDI made reasonable efforts to evaluate project LFN issues based on the criteria set out in Rule 012, and the Commission accepts the conclusion presented in the project NIA that the project will likely not create LFN issues at any noise receptors. The Commission notes that a post-construction comprehensive sound level (CSL) survey will be helpful in confirming this conclusion.

Post-construction monitoring

381. The Commission observes that based on the RWDI updated model and as agreed upon by Ms. Drew, the project's predicted cumulative sound levels are closest to the nighttime PSL at nine receptors: R14, R16, R17, R19, R25, R28, R29, R32 and R35.⁴⁸¹ Ms. Drew testified that from a practical perspective, these nine receptors would be acceptable monitoring locations in the event the Commission were to direct post-construction noise monitoring for the project.⁴⁸² EDP made the following commitment:

[EDP] will conduct appropriately designed and suitably representative post-construction noise monitoring at select receptors, in accordance with the methodology set out in Rule 012.⁴⁸³

⁴⁸¹ Transcript, Volume 3, page 584, lines 17-24.

⁴⁸² Transcript, Volume 3, page 584, lines 17-20; Transcript, Volume 3, pages 588-589, lines 25-7.

⁴⁸³ Exhibit 22665-X0289, Outstanding Undertakings, page 4.

382. Compliance with the PSL is of utmost importance to the Commission. The Commission also recognizes that noise modelling inputs, parameters, standards, results and noise compliance were major concerns raised by the Clearview Group. Although the project is predicted to meet the PSL calculated in accordance with Rule 012 based on the NIA conducted, given the concerns raised by the Clearview Group and given that the predicted sound levels are close to the nighttime PSL at a number of receptors, the Commission will require EDP to complete a comprehensive post-construction CSL survey to verify compliance with Rule 012 once the project commences operation. The post-construction CSL survey must be conducted under representative conditions and follow Rule 012 requirements. In addition, the survey must evaluate LFN in accordance with Rule 012.

383. With respect to the selection of locations for post-construction noise surveys, Ms. Drew recommended that the factors to consider, amongst others, are: the degree of conservatism in the model, the confidence in the source data going into the model, and that the receptors where project turbines are predicted to contribute more noise than third-party facilities should be prioritized as survey locations.⁴⁸⁴ Mr. de Haan considered post-construction noise monitoring to be an ineffective method of verifying compliance with Rule 012, but indicated that if such a program were to proceed, New Brigden and Sedalia should be included as monitoring locations, as well as other receptors that are predicted to be close to the PSL.⁴⁸⁵

384. There were 10 dwelling locations mentioned and discussed at the hearing as potential monitoring locations for a post-construction CSL survey, including the nine receptors identified above as being close to the PSL: R14, R16, R17, R19, R25, R28, R29, R32, R35 (representative of Sedalia), and R36 (representative of New Brigden). The Commission must consider a number of criteria when selecting monitoring locations for post-construction CSL surveys, including commitments made by EDP, project layout, relative contributions of project sound levels to receptors, predicted cumulative sound levels and their margin of compliance, the degree of conservatism in the model, technical feasibility, and concerns brought forward by local residents in the study area.

385. Of the 10 candidate locations identified above, R16, R17, R28, R29 and R35 have predicted margins of compliance less than or equal to 0.5 dBA, according to the RWDI updated model.

386. A small predicted margin of compliance for a given dwelling suggests an increased potential for measuring non-compliance during a post-construction CSL survey, compared to a dwelling where the predicted margin of compliance is larger. In other words, if a post-construction CSL survey demonstrates compliance at a dwelling with a small predicted margin of compliance, then it is reasonable to assume that measured noise levels at dwellings with larger predicted compliance margins would also be compliant. Consequently, the Commission has focused on the receptors with the smallest margins of compliance when selecting potential monitoring locations for a post-construction CSL survey. In particular, the Commission has focused on receptors R16, R17, R28, R29 and R35, at which the RWDI updated model predicts margins of compliance of 0.4 dBA, 0.4 dBA, 0.4 dBA, 0.5 dBA, and 0.3 dBA, respectively.

⁴⁸⁴ Transcript, Volume 3, page 590, lines 3-20.

⁴⁸⁵ Transcript, Volume 5, page 1152, lines 17-20.

387. According to the RWDI updated model, the predicted nighttime cumulative sound level is 39.6 dBA at both receptors R16 and R17, and the predicted noise contribution from third-party facilities is 8.5 dBA, which is well below the nighttime ASL of 35 dBA. The predicted noise contribution from the project turbines is 37.8 dBA at R16 and 37.7 dBA at R17, which suggests the project will be a major noise contributor at both R16 and R17. For these reasons, the Commission finds that R16 and R17 are both suitable locations for a post-construction CSL survey.

388. However, receptors R16 and R17 are located less than 80 metres apart from each other. Due to the short distance between R16 and R17, it is likely that surroundings and ground cover conditions at these two receptors are similar. As such, the Commission considers that there would be little value in collecting post-construction CSL data at both locations. Because the noise contribution from the project is predicted to be slightly higher at R16 than at R17, the Commission finds that R16 would be the better monitoring location for the purposes of testing project noise compliance.

389. According to the RWDI updated model, the predicted nighttime cumulative sound level is 39.6 dBA at R28 and 39.5 dBA at R29, and the predicted noise contribution from third-party facilities is 12.8 dBA, which is well below the nighttime ASL of 35 dBA. The predicted noise contribution from the project turbines is 37.8 dBA at R28 and 37.6 dBA at R29, which suggests the project is a major noise contributor at both R28 and R29. For these reasons, the Commission finds that R28 and R29 are both suitable locations for a post-construction CSL survey.

390. However, receptors R28 and R29 are located less than 32 metres apart. Due to the short distance between R28 and R29, it is likely that surroundings and ground cover conditions at these two receptors are similar. As such, the Commission finds that there would be little value to collecting post-construction CSL data at both locations. Because the noise contribution from the project is predicted to be slightly higher at R28 than at R29, the Commission finds that R28 is the better monitoring location for the purposes of testing project noise compliance.

391. As noted above, receptor R35 represents the hamlet of Sedalia and receptor R36 represents the hamlet of New Brigden. For the reasons that follow, the Commission considers that receptor R35 should also be used for post-construction monitoring, but not receptor R36.

392. The Commission notes that the predicted noise contribution from the project wind turbines at R35 is less than the noise contribution from the third-party facilities and less than the ASL. As such, the Commission finds that R35 is not an ideal location for noise monitoring. However, potential noise impacts to Sedalia were identified as a major concern by the Clearview Group. Some members of the Clearview Group have residences within the hamlet of Sedalia, and the predicted nighttime cumulative sound level at R35 is only 0.3 dBA below the nighttime PSL. For these reasons, the Commission will require EDP to conduct a post-construction CSL at R35.

393. The Commission notes that the predicted noise contribution from the project at R36 (the hamlet of New Brigden) is less than the nighttime ASL, and the predicted nighttime cumulative sound level at R36 is 3.1 dBA less than the nighttime PSL. As a result, the project is not predicted to be a major noise contributor at receptor R36 and there is a relatively large (3.1 dBA) margin of compliance at that receptor, indicating that the utility of choosing R36 as a post-construction monitoring location is relatively low. For these reasons, the Commission will not require post-construction noise monitoring at R36 as a condition of approval.

394. Based on the foregoing the approval will be subject to the following condition to verify and confirm that the project complies with the requirements of Rule 012:

- EDP shall conduct a post-construction comprehensive sound level survey, including an evaluation of LFN, at receptors R16, R28, and R35. The post-construction comprehensive sound level survey must be conducted under representative conditions and in accordance with Rule 012. EDP shall file all studies and reports relating to the post-construction comprehensive noise survey with the Commission within one year of connecting the power plant to the Alberta Interconnected Electric System.

Conclusion

395. Having regard to the foregoing, the Commission concludes that noise from the project is expected to satisfy the nighttime and daytime PSL values at all receptors and the project is unlikely to cause an LFN condition at any noise receptor. However, the Commission will require EDP to conduct a post-construction CSL survey, including an evaluation of LFN, at receptors R16, R28 and R35 under representative operating conditions and in accordance with Rule 012.

8 Aeronautical impacts

8.1 Introduction

396. The Clearview Group raised concerns with the project's impact on three private airstrips (the three airstrips) in the project area:

- The Larry Ness airstrip is located in the north half of Section 18, Township 32, Range 4, west of the Fourth Meridian.
- The Jim Ness airstrip is located in the southwest quarter of Section 1, Township 32, Range 5, west of the Fourth Meridian.
- The Jorgenson airstrip is located in the southwest quarter of Section 34, Township 31, Range 4, west of the Fourth Meridian.

397. EDP retained Tetra Tech's Airports Group to analyze the project's potential impacts on the three airstrips. EDP submitted a report from Tetra Tech titled Responses to Intervener Evidence Aerodromes & Aviation.⁴⁸⁶ Mr. Shawn Sutherland from Tetra Tech testified at the hearing as someone who has worked in aviation for over 38 years in the areas of airport management, regulatory compliance, operations and development. He also identified himself as a former pilot.

398. The Clearview Group retained Mr. Conrad Hatcher, a consultant, who submitted a report titled Written Evidence of Conrad Hatcher.⁴⁸⁷ Mr. Hatcher indicated that he currently works as a flight instructor, a pilot examiner and a pilot. He also stated that until recently, he was a board member for the Canadian Owners and Pilots Association. Mr. Leonard Jorgenson and Mr. Chris Jorgenson testified and provided information concerning the Jorgenson airstrip.

⁴⁸⁶ Exhibit 22665-X0201, Appendix E - Air strips - SHWF Reply Evidence – Tetrattech.

⁴⁸⁷ Exhibit 22665-X0170, Tab 1 - Written Evidence of Conrad Hatcher.

Mr. Jim Ness testified on behalf of himself and his brother Mr. Larry Ness, and provided information about the Jim Ness airstrip and the Larry Ness airstrip.

399. To further understand some concerns raised by parties with respect to the airstrips, a discussion of background aeronautical information is provided below. Next is a section providing information on the three airstrips. Following that, views of EDP, views of the Clearview Group and Commission findings are presented on these aeronautical issues: circuits; surfaces near the three airstrips; and, turbulence, aerial spraying and setbacks requested.

8.2 Aeronautical background

400. The federal Minister of Transport, through Transport Canada, regulates aviation matters in Canada. Transport Canada publishes TP312 *Aerodrome Standards and Recommended Practices* (TP312)⁴⁸⁸ from time to time. The latest version of the document, the 5th edition, was effective September 15, 2015. TP312 sets out the standards and recommended practices for aerodromes in Canada and establishes the minimum level of compliance required for the planning and design of airport infrastructure or level of service changes.⁴⁸⁹

401. Transport Canada recognizes three different categories of aerodromes, each presenting progressively more stringent safety requirements. In order of ascending safety requirements, the categories are listed below:

- aerodromes (small airstrips located on private property that are neither registered nor certified)
- registered aerodromes
- certified aerodromes, referred to as airports⁴⁹⁰

402. An aerodrome is defined by Transport Canada as any area of land, water (including the frozen surface thereof) or other supporting surface used or designed, prepared, equipped or set apart for use either in whole or in part for the arrival, departure, movement or servicing of aircraft and includes any buildings, installations and equipment situated thereon or associated therewith.⁴⁹¹

403. An airport is defined by Transport Canada as an aerodrome for which, under Part III of the *Canadian Aviation Regulations*, an airport certificate has been issued by the Minister.⁴⁹² Certified airports are subject to Transport Canada's enforcement of specific regulations and standards in order to maintain their certificates.⁴⁹³

404. Mr. Sutherland explained that for aerodromes that are neither registered nor certified, information about the facilities and/or services at these airstrips is not available to the public in

⁴⁸⁸ Exhibit 22665-X0175, CG Information Request Response to CG-AUC-2018MAY03-028(a).

⁴⁸⁹ Exhibit 22665-X0175, CG Information Request Response to CG-AUC-2018MAY03-028(a), page 13.

⁴⁹⁰ *Aeronautics Act*, RSC 1985, c A-2; *Canadian Aviation Regulations*, SOR/96-433; also see e.g. Transport Canada, Chapter 6 – Airports, online: <https://www.tc.gc.ca/eng/civilaviation/publications/tp13549-chapter6-406.htm#aerodrome_or_airport,%20aerodrome%20categories>.

⁴⁹¹ Exhibit 22665-X0163, Exhibit G to Written Evidence of Conrad Hatcher, page 8.

⁴⁹² Exhibit 22665-X0163, Exhibit G to Written Evidence of Conrad Hatcher, page 8.

⁴⁹³ Exhibit 22665-X0201, Appendix E - Air strips - SHWF Reply Evidence – Tetrtech, page 7.

official Aeronautical Information Publications. He further explained that the operator of an aerodrome must provide Transport Canada with information respecting the location, markings, lighting, use and operation of the aerodrome in order to become registered. If this is completed, Transport Canada shall register the aerodrome and NAV CANADA⁴⁹⁴ will publish the information in the Canadian Flight Supplement.⁴⁹⁵

405. The three airstrips are aerodromes but are not registered aerodromes and are not certified as airports. Further, there are currently no airport zoning regulations limiting activities, construction, etc. near aerodromes in or near the project area.

406. Transport Canada published TP1247E (2013/2014) *Aviation Land Use in the Vicinity of Aerodromes* (TP1247), and it is dated 2013/2014.⁴⁹⁶ TP1247 “is designed to assist planners and legislators at all levels of government in becoming familiar with issues related to land use in the vicinity of aerodromes.”⁴⁹⁷

407. Mr. Sutherland and Mr. Hatcher had conflicting opinions on how and if TP312 and TP1247 should be considered in determining the impacts of the project on the three airstrips.

408. Both witnesses gave evidence on aircraft being operated with visual flight rules (VFR). Mr. Hatcher described VFR as follows:

All pilots, when they learn to fly, operate under the visual flight rules, and that essentially requires minimum visibility be present at the time you're operating, and that you're able to see the ground to navigate and to control the airplane with reference to the ground.⁴⁹⁸

409. Mr. Sutherland explained that operating an aircraft safely under VFR is based on the principle of see and avoid, while maintaining positive control.⁴⁹⁹

410. There was also considerable evidence regarding a circuit performed at an aerodrome. Mr. Sutherland explained that a circuit is a VFR procedure where a pilot flying with visual reference to the ground uses that procedure to enter, turn, descend and land.

411. Mr. Hatcher explained a circuit as follows:

So the circuit is essentially the standard traffic pattern that we use at airports around the world. And this is primarily how you would fly the aircraft in the vicinity of the airport in the traffic pattern when you're operating under the visual flight rules. So in other words, it would be the pilot's job to fly that rectangular pattern.⁵⁰⁰

⁴⁹⁴ From <http://www.navcanada.ca/EN/Products-and-Services/Pages/default.aspx> NAV CANADA is the company that owns and operates Canada's civil air navigation service. NAV CANADA stated that its services encompass air traffic control, flight information, weather briefings, aeronautical information, airport advisory services and electronic aids to navigation.

⁴⁹⁵ Exhibit 22665-X0201, Appendix E - Air strips - SHWF Reply Evidence – Tetrattech, page 7.

⁴⁹⁶ Exhibit 22665-X0163, Exhibit G to Written Evidence of Conrad Hatcher.

⁴⁹⁷ Exhibit 22665-X0163, Exhibit G to Written Evidence of Conrad Hatcher, page 4.

⁴⁹⁸ Transcript, Volume 4, page 953, lines 19-24.

⁴⁹⁹ Exhibit 22665-X0201, Appendix E - Air strips - SHWF Reply Evidence – Tetrattech, page 7.

⁵⁰⁰ Transcript, Volume 4, page 954, lines 19-22.

8.3 The three airstrips

412. The closest turbine to the Jorgenson airstrip would be Turbine 75, located 1,693 metres from the airstrip. Eleven turbines would be within four kilometres of the Jorgenson airstrip, namely turbines 71, 72, 73, 74, 75, 76, 77, 84, 85, 86 and STW_4.⁵⁰¹

413. Mr. Chris Jorgenson and Mr. Leonard Jorgenson testified that the Jorgenson airstrip was constructed in 1975 by Leonard's father, Mr. Ralph Jorgenson. The Jorgenson airstrip is a grass airstrip maintained by Mr. Chris Jorgenson. Mr. Leonard Jorgenson uses the airstrip when flying to the farm with his plane that is stored at the Springbank Airport near Calgary. Mr. Leonard Jorgenson estimated that since 1984, there have been an average of 67 flights annually at the airstrip and that it was used by Mr. Ralph Jorgenson weekly, if not daily, from 1975 to 2010. Mr. Leonard Jorgenson stated that he has continued to use the Jorgenson airstrip, at a lesser frequency because he does not live there, but it is still used regularly by himself and others in the area.⁵⁰²

414. The closest turbine to the Larry Ness airstrip would be Turbine 90, located 2,435 metres from the airstrip. Four turbines would be within four kilometres of the Larry Ness airstrip, namely turbines 90, 91, 92 and 93. The Larry Ness airstrip was constructed in 1972. It was estimated that there are 150 takeoffs and landings per year at the Larry Ness airstrip.

415. The closest turbine to the Jim Ness airstrip would be Turbine 64, located 2,393 metres from the airstrip. Six turbines would be within four kilometres of the Jim Ness airstrip, namely turbines 53, 54, 63, 64, 65 and 66. The Jim Ness airstrip was constructed in 1978. It was estimated that there are 80 takeoffs and landings per year at the Jim Ness airstrip.

416. Both of the Ness airstrips are grass. Mr. Larry Ness and Mr. Jim Ness stated that they own eight or nine planes. There are five hangars at the Larry Ness airstrip and one hangar at the Jim Ness airstrip, with one additional hangar under construction. The Nesses further stated that two friends also store planes in the Larry Ness airstrip's hangars.

417. Mr. Jim Ness testified that:

[...] when you're doing the kind of flying that we're doing, we use the small airplanes just like a pickup truck. We'll land on the field. If we're having trouble with equipment, we have to fly somewhere to get parts, we just land in the field. So it's a farm implement. And that's -- we've used airplanes, different models, for 40 years doing that.⁵⁰³

418. The Clearview Group stated that all of the airstrips are active and have windsocks. In total, 21 turbines were proposed to be located within four kilometres of the three airstrips.⁵⁰⁴

⁵⁰¹ EDP stated that STW turbines were subject to waiver from a non-project landowner. EDP stated that it has completed setback waiver agreements with landowners adjacent to the project leased lands with deeded or leased Crown land, pursuant to the Special Areas Board Land Use Order.

⁵⁰² Transcript, Volume 4, page 935, lines 16-22.

⁵⁰³ Transcript, Volume 4, page 939, lines 5-12.

⁵⁰⁴ Transcript, Volume 3, page 561, lines 17-25.

8.4 Circuits

8.4.1 Views of EDP

419. Mr. Hatcher and the Clearview Group raised concerns with aircraft being operated with VFR in the vicinity of the project and at the three airstrips. Mr. Hatcher submitted that after takeoff and prior to landing are the phases of the flight where the aircraft is at its lowest energy state, meaning that the aircraft is low to the ground and flying at slow speeds. Mr. Hatcher stated that as a result, a pilot's ability to recover from unexpected events or unusual attitudes is also at its lowest.⁵⁰⁵

420. Mr. Sutherland acknowledged that aircraft are in their lowest energy state just after takeoff and prior to landing as indicated by Mr. Hatcher.⁵⁰⁶ Mr. Sutherland explained that the in-flight procedures a pilot would use when flying in VFR near large obstacles, such as turbines, would be as follows:

So flying in visual flight rules, whether you're coming straight in, whether you're flying a circuit, as described in Mr. Hatcher's evidence, if there are obstacles that are in the vicinity of the procedure where the aircraft might go, then the adjustments to the procedure would be potentially two different ways. One is altitude. You might take part of the procedure at a higher altitude than you otherwise would have. And the other one is the direction. There's mention in Mr. Hatcher's evidence with regard to left-hand circuits versus right-hand circuits. So where an aerodrome has obstacles on one side but maybe not on the other, then when they're landing from one direction, the circuit is to the left, and when they're landing from the other direction, the circuit is to the right. And if they do a procedure over the obstacles, then it could be higher than a thousand feet aboveground, or whatever adjustment needs to be made to make the procedures safe.⁵⁰⁷

421. Mr. Sutherland acknowledged that the project's turbines would influence which direction of circuit a pilot would probably fly at the three airstrips.⁵⁰⁸ Mr. Sutherland asserted that right-hand circuits are commonly used in areas where there are obstacles on one side. He explained that the Canada Flight Supplement identifies that there are right-hand circuits on runways at multiple airports and aerodromes in Canada. Mr. Sutherland stated that both right-hand and left-hand circuits are safe. He stated:

[...] they're both safe because Transport Canada, as the regulator, allows them to happen and they have a specific regulation for that. And if they weren't safe, they wouldn't be allowed to be.⁵⁰⁹

8.4.2 Views of the Clearview Group

422. The Clearview Group pointed out that Mr. Hatcher and Mr. Sutherland agreed that the turbine layout proposed by EDP would affect the ability of pilots to complete a left-hand circuit into all three of these airstrips. The Clearview Group raised concerns with pilots performing right-hand circuits at the three airstrips. Mr. Hatcher testified that:

⁵⁰⁵ Exhibit 22665-X0170, Tab 1 - Written Evidence of Conrad Hatcher, page 6, paragraph 17.

⁵⁰⁶ Exhibit 22665-X0201, Appendix E - Air strips - SHWF Reply Evidence – Tetratch, page 11.

⁵⁰⁷ Transcript, Volume 3, pages 520-521, lines 13-7.

⁵⁰⁸ Transcript, Volume 3, pages 522-523, lines 9-5.

⁵⁰⁹ Transcript, Volume 3, page 524, lines 7-14.

[...] left-hand circuits are standard. Left-hand circuits are preferred. And the reason that they're preferred is that, conventionally, the pilot will sit in the left-hand seat. That is the designated pilot seat in virtually all aircraft. So if you're flying [...] with left turns, it's easier to orient yourself to the runway because you can see it better.⁵¹⁰

423. With respect to right-hand circuits, Mr. Hatcher added:

On the issue of the right-hand circuit, there are lots of airports where a right-hand circuit has been designated. The way I would put it is they're less convenient than a left-hand circuit. They require a little more pilot attention because we're more accustomed to doing left-hand circuit because they're, by far, the prevalent procedure. But right-hand circuits can certainly be accomplished.⁵¹¹

424. Mr. Leonard Jorgenson also expressed concerns with right-hand circuits. He compared flying a right-hand circuit to driving a right-hand drive car in a left-hand drive jurisdiction. He explained that it is possible, but not preferred.⁵¹²

425. The Clearview Group also raised concerns with maintaining altitude when flying over the turbines. Mr. Leonard Jorgenson stated that:

When we talk about altitudes in the small aircraft, winds aloft can have a huge impact on your ability to maintain a constant altitude. As an example, on my flight out last night, it was -- it was quite windy, you know, between Calgary and New Brigden, and it was not uncommon for me to be losing or gaining 2 or 300 feet in altitude while trying to maintain level flight.

[...] Controlling your altitude is a continual challenge.⁵¹³

426. Mr. Hatcher testified that at the Larry Ness strip, the turbines would be a barrier when landing and taking off in a more southerly direction and trying to fly a left-hand circuit. He added that even if performing a right-hand circuit, turbines 53A and 54A would produce an impediment.

427. Mr. Hatcher stated that at the Jim Ness strip:

[...] if I was departing in a northwest direction, I'm sort of aimed at those two wind turbines: 53 and 54. And there are a couple of concerns about that. But, you know, one of them is the airplane's in a low energy state. I'm downwind of the wind turbine. That's not a wonderful situation because they do create a lot of turbulence. But the other is I may have difficulty climbing above them. And I'm sort of boxed in on this airstrip. Really any direction I turn, there's a wind turbine. So it leads to an unsafe situation. There's no real clear way out. And it's going to be like an obstacle course.⁵¹⁴

428. Mr. Hatcher and Mr. Sutherland differed in opinion on how much of a vertical separation should be required when flying over wind turbines. Mr. Hatcher stated that the separation should be 1,000 feet, while Mr. Sutherland stated the separation should be 500 feet. The Clearview Group argued that the difference between those two opinions comes from an

⁵¹⁰ Transcript, Volume 4, page 957, lines 10-17.

⁵¹¹ Transcript, Volume 4, page 1007, lines 17-24.

⁵¹² Transcript, Volume 4, page 1008, lines 3-16.

⁵¹³ Transcript, Volume 4, pages 968-969, lines 24-9.

⁵¹⁴ Transcript, Volume 4, page 971, lines 9-20.

interpretation of Section 602.14(2) of the *Canadian Aviation Regulations*. The Clearview Group stated:

Mr. Sutherland, in his reply evidence, cited paragraph (b) of that section. And basically it says that you need to be flying at least 500 feet from any, quote, "person, vessel, vehicle or structure."

Mr. Hatcher, by contrast, relied on paragraph (a) which says that when you are flying over a, quote, "built-up area, you need to be 1,000 feet above the highest obstacle located within a hazard distance of 2,000 feet."

So Mr. Hatcher's interpretation basically is this: You develop 83 200-metre tall turbines. That means there's now a built-up area around these airstrips. If you're going to fly over those turbines, you've got to be 1,000 feet.⁵¹⁵

429. Mr. Leonard Jorgenson testified that on a hot summer day, the climb capability of his aircraft is low and he would have concerns about climbing over tall obstacles.

Mr. Leonard Jorgenson explained that he would not be comfortable flying over the project to reach the Jorgenson airstrip. He added that turbines 75 to 77 are a very serious concern.

430. The Clearview Group argued that if turbines 74 to 77 are approved, Mr. Leonard Jorgenson would have to fly over those turbines at less than 1,000 feet or he would have to fly higher, requiring a much greater and more rapid descent to get down to his landing altitude.

8.4.3 Commission findings

431. The Commission is satisfied that left-hand circuits and right-hand circuits can be completed safely, given that both experts agreed that this is the case. Additionally, Mr. Hatcher acknowledged that there are many airports which use right-hand circuits even though right-hand circuits are not preferred.

432. The Commission acknowledges that the project may limit the ability to complete a circuit on one side of each of the three airstrips, but finds that this is not significant because both left-hand and right-hand circuits are acceptable landing and take-off protocol. Given that the airstrips are not registered and there are no instrument procedures published at the three airstrips, no published procedures would be required to be modified as a result of this potential limitation.

8.5 Surfaces near the three airstrips

8.5.1 Views of EDP

433. EDP stated that it was important to note that there are no airport zoning regulations in the vicinity of the project, nor are there any provincial or municipal restrictions on the use of land in proximity to the three airstrips.

434. Mr. Sutherland stated that the aviation regulations and aerodrome standards imposed by Transport Canada provide a definitive safety margin and it is a matter of conformance or non-conformance. Mr. Sutherland analyzed whether aircraft can continue to be safely operated to and from the three airstrips after the completion of the project by assessing the requirements in TP312. Mr. Sutherland stated that TP312 is a standards manual that complements the

⁵¹⁵ Transcript, Volume 5, pages 1283, lines 4-17.

Canadian Aviation Regulations CAR 302, which includes the provisions set out for airports. Mr. Sutherland explained that these requirements include physical characteristics, the obstacle limitation surface (OLS), visual aids and technical services the aerodrome operator at a certified land aerodrome (airport) provides to support aircraft operations.

435. Evidence was given by both parties with respect to the OLS. TP312 defines an OLS as follows:

Obstacle limitation surface (OLS). A surface that establishes the limit to which objects may project into the airspace associated with an aerodrome so that aircraft operations at the aerodrome may be conducted safely. OLS consist of the following:

- Inner transitional surface. A complex surface extending lengthwise on the runway strip that extends upwards and outwards to the outer obstacle identification surface.
- Approach surface. An inclined plane preceding the threshold of a runway.
- Take-off surface. An inclined plane beyond the end of the runway or clearway, if provided.
- Transitional surface. A complex surface along the side of the runway strip and all or part of the side of the approach surface, that slopes upwards and outwards to a specified height.⁵¹⁶ [French translations omitted]

436. Mr. Sutherland stressed that the three airstrips are not registered. He also submitted that there is no OLS for the three airstrips because they are not certified, nor do they have instrument approach procedures published in official Aeronautical Information Publications.⁵¹⁷

437. Out of caution, EDP stated that it voluntarily considered the standards for OLS identified in TP312 when planning the locations of wind turbines for the project. EDP applied the standards from TP312 normally associated with a small airport where small aircraft arrive and depart, i.e., Aircraft Group Number I, non-instrument (no instrument approach procedure published) runways. This standard would impose a surface starting from each end of the runways with a ten per cent transitional surface, and a 2,500 metre take-off/approach surface at five per cent slope. Mr. Sutherland stated that EDP did not site turbines within the OLS, which would ensure that aircraft can continue to be operated to and from the three airstrips. EDP confirmed that no turbine would penetrate the OLS as defined by TP312 for the three airstrips.

438. Mr. Hatcher raised concerns with what he identified as the outer surface for each of the three airstrips. He stated that TP1247 and TP312 provide that the outer surface of an aerodrome shall be 45 metres elevation above the aerodrome, extending to a horizontal distance of at least 4,000 metres from the runway. Mr. Hatcher contended that the project's 200-metre tall turbines located within 4,000 metres of the three airstrips would penetrate the outer surface and stated that these turbines would compromise safety.

⁵¹⁶ Exhibit 22665-X0175, CG Information Request Response to CG-AUC-2018MAY03-028(a), page 20.

⁵¹⁷ Exhibit 22665-X0201, Appendix E - Air strips - SHWF Reply Evidence – Tetratch, page 7.

439. In response, Mr. Sutherland stated that Transport Canada publishes a number of guidance documents, including TP1247. EDP argued that there is nothing in TP1247 that indicates it is enforceable or otherwise binding on a party.⁵¹⁸

440. Mr. Sutherland asserted that TP1247 contains outdated information on standards that apply to certified airports in Canada because the current version of TP312 was published after TP1247. Mr. Sutherland stated that Mr. Hatcher's definition of OLS came from TP312 4th Edition and the current standards, found in TP312 5th Edition, define and diagram the OLS differently. Mr. Sutherland stated that what Mr. Hatcher described as an outer surface (as it was set out in TP312 4th Edition) is now referred to as an outer obstacle identification surface (OIS).

441. TP312 5th Edition defines the outer OIS as follows:

Obstacle identification surface (OIS). A surface that is used to identify obstacles that project into the airspace associated with an aerodrome. Obstacle identification surfaces consist of the following:

- Outer obstacle identification surface. A surface located in a horizontal plane above an aerodrome and the surrounding area.
- Approach obstacle identification surface. An inclined plane preceding the threshold of a runway.⁵¹⁹ [French translations omitted]

442. Mr. Sutherland stated that as detailed in TP312, an OIS does not prohibit or limit structures from being placed. An OIS is provided for the purpose of identifying obstacles that require assessment as part of airspace protection for aircraft manoeuvring in the vicinity of an aerodrome. Objects that protrude into an OIS may, under certain circumstances, cause an increase in the obstacle clearance altitude/height for an instrument approach procedure or any associated visual circuit procedure. Further, Mr. Sutherland stated that the OIS is primarily focused on instrument approach procedures, and that there are no instrument approach procedures published for the private airstrips. EDP argued that Mr. Hatcher misunderstands the reference to the 4,000-metre outer surface, and EDP submitted that nowhere in TP312 does it suggest that an obstacle in the OIS needs to be removed or that it will cause a risk to safety.⁵²⁰

443. The Clearview Group also raised a comparison between the project and a wind power development considered in that case by the Ontario Environmental Review Tribunal in *Wiggins v Ontario*.⁵²¹ EDP submitted that the comparison between the project and the Ontario Environmental Review Tribunal case is unsubstantiated. EDP stated that unlike the three airstrips in the project area, at the time of the Ontario Environmental Review Tribunal hearing, the aerodromes considered were registered aerodromes that were open for public use and accommodated considerable aircraft movement activities, including pilot training. EDP stated that one of the aerodromes at issue had published instrument approach procedures, evidencing the high frequency of airstrip use by members of the public not otherwise familiar with the area.

⁵¹⁸ Transcript, Volume 5, page 1213, lines 5-6.

⁵¹⁹ Exhibit 22665-X0175, CG Information Request Response to CG-AUC-2018MAY03-028(a), page 20.

⁵²⁰ Exhibit 22665-X0290, Reply Argument, page 9, paragraph 21.

⁵²¹ Exhibit 22665-X0162, Tab 2 - *Wiggins v Ontario*, Ontario Environmental Review Tribunal, Case No. 16-036, October 18, 2016.

EDP argued that none of these circumstances exist for the three airstrips at issue in this proceeding.

8.5.2 Views of the Clearview Group

444. The Clearview Group submitted that although none of the three airstrips are registered with Transport Canada, they are registered with the Alberta Aviation Council and therefore the three airstrips appear on the Alberta Aviation Council's public maps that pilots can use for reference.

445. Mr. Hatcher acknowledged in testimony that TP312 has recommended safety standards for all aerodromes, including the three airstrips.⁵²² Mr. Hatcher also acknowledged that if the transitional surface, the approach surface, and the takeoff surface have been protected, it would sound reasonable that there would be no infringement on the OLS.⁵²³

446. Regardless of whether the project complied with the requirements of TP312, the Clearview Group argued that the majority of TP312 does not apply to the three airstrips; instead, TP1247 should be applied. The Clearview Group argued that TP312 is a regulatory document, which meant that Transport Canada has jurisdiction over an aerodrome operator. The Clearview Group further argued that there is no jurisdiction with respect to the three airstrips because the three airstrips are not registered and Transport Canada probably does not know about them.

447. The Clearview Group stated that TP1247 is the critical document that should be looked at by the Commission and planning authorities for guidance. The Clearview Group stressed that TP1247 is titled *Aviation, Land Use in the Vicinity of Aerodromes*. It argued that if the Commission approves the project, it will be approving development in the vicinity of an aerodrome and compromising the safety of that aerodrome, which is the primary purpose of TP1247.

448. The Clearview Group stressed that TP1247 was specifically revised to address wind farms. Further, it stated that TP1247 applied to all categories of aerodromes, and therefore includes the three airstrips.

449. Mr. Hatcher quoted the definition of an OLS from TP1247 which stated:

Obstacle Limitation Surface: A surface that establishes the limit to which objects may project into the airspace associated with an aerodrome consisting of the following; a takeoff surface, an approach surface, a transitional surface and an outer surface.⁵²⁴

450. Mr. Hatcher explained that one of these OLSs is the outer surface, which establishes the height above which obstacles should not be allowed to penetrate. He submitted that TP312 provides that the outer surface of an aerodrome shall be 45 metres above the aerodrome, extending to a horizontal distance of at least 4,000 metres from the runway. Mr. Hatcher submitted that the 200-metre tall turbines proposed by EDP are far in excess of 45 metres in height, and that there are 21 turbines proposed to be located within 4,000 metres of the three airstrips. The Clearview Group argued that TP1247 provides that tall structures should not be

⁵²² Transcript, Volume 4, page 978, lines 1-19.

⁵²³ Transcript, Volume 4, page 985-986, lines 19-2.

⁵²⁴ Exhibit 22665-X0163, Exhibit G to Written Evidence of Conrad Hatcher, page 8.

erected within the outer surface area of 4,000 metres around the central reference point of an aerodrome.

451. As noted above, the Clearview Group compared the project with a wind power development considered by the Ontario Environmental Review Tribunal in *Wiggins v Ontario*. The Clearview Group argued that the Ontario Environmental Review Tribunal considered TP1247 to be a valid document that still provided up-to-date guidance to planners on how specific land uses may affect aerodromes.

452. The Clearview Group stated that although the aerodromes in the Ontario Environmental Review Tribunal case were used more often than the three airstrips in the project area, the impact on safety would be the same: whenever a pilot takes off or lands, he or she will have to contend with several wind turbines which penetrate the outer surface of the aerodrome. Further, it pointed out that the proximity of the turbines to the aerodromes in the Ontario Environmental Review Tribunal case was similar to the proximity of the project's turbines to the three airstrips. Finally, it stated that the project's proposed 200-metre tall turbines would be significantly taller than the 145-metre tall turbines proposed in the Ontario case.

8.5.3 Commission findings

453. The Commission recognizes that TP312 sets out recommended safety standards for all aerodromes, including the three airstrips that are the subject of this proceeding. OLS is defined in TP312 as “[a] surface that establishes the limit to which objects may project into the airspace associated with an aerodrome so that aircraft operations at the aerodrome may be conducted safely.”⁵²⁵ The Commission is of the view that if EDP's proposed turbine placements do not penetrate the OLS at the three airstrips, aircraft operations at the aerodrome may still be conducted safely.

454. The Commission notes that Mr. Sutherland referenced the 5th Edition of TP312, while Mr. Hatcher often referenced the 4th Edition of TP312. The Commission finds that Mr. Hatcher's use of the previous edition of the TP312 standard was not helpful and only served to complicate the issue.

455. With respect to the OLS set out in TP1247, the Commission notes that TP1247 is a guidance document. The Commission recognizes that the definition of the OLS used in TP1247 is not consistent with the definition in TP312, which is a document that establishes standards for aerodromes. Further, TP1247 sets out an outer surface as follows:

1.3 Outer Surface

An outer surface shall be established where required for the protection of aircraft conducting a circling procedure or manoeuvring in the vicinity of an aerodrome. The outer surface establishes the height above which it may be necessary to take [sic] one or more of the following actions:

- (a) restrict the erection of new structures which would constitute an obstruction;
- or

⁵²⁵ Exhibit 22665-X0175, CG Information Request Response to CG-AUC-2018MAY03-028(a), page 20.

(b) remove or mark obstacles to ensure a satisfactory level of safety and regularity for aircraft manoeuvring visually in the vicinity of the airport before commencing the final approach phase⁵²⁶ [emphasis added]

456. The wording in the outer surface definition in TP1247 does not provide definitive evidence that the surface must be preserved. The phrases “shall be established where required” and “[t]he outer surface establishes the height above which it may be necessary” do not indicate the definitive safety impacts that Mr. Hatcher suggested. Further, TP1247 states that one of the actions that may be taken is to “remove or mark obstacles to ensure a satisfactory level of safety and regularity for aircraft manoeuvring visually in the vicinity of the airport before commencing the final approach phase.” EDP has indicated that it will mark the turbines as required by Transport Canada.⁵²⁷ This appears to be consistent with the guidance in TP1247.

457. TP312 provides that if an obstacle infringes upon OIS, further assessment is required as follows:

4.3.3.2 An object infringing upon an OIS is reported to both the aeronautical information service provider and [Transport Canada Civil Aviation] for further assessment regarding:

- (a) the requirement to light, mark or chart the object;
- (b) any impact on VFR arrival/departure and circuit procedures;
- (c) any impact on IFR arrival/departure procedures; and
- (d) any impact on aerodrome zoning regulations, where applicable.⁵²⁸

458. As was explained by Mr. Sutherland, in TP312, an OIS does not prohibit or limit structures from being placed within it. The Commission agrees with Mr. Sutherland that an OIS is provided for the purposes of identifying obstacles that require assessment as part of airspace protection for aircraft manoeuvring in the vicinity of an aerodrome. As such, the Commission finds that TP312 does not prohibit the siting of turbines within an OIS.

459. With respect to the Ontario Environmental Review Tribunal case, the Commission finds that the situations presented are not comparable to the project because they dealt with aerodromes⁵²⁹ that were open for public use, accommodated considerable aircraft movement activities, including pilot training, and one of the aerodromes had published instrument approach procedures.⁵³⁰ The three airstrips in this proceeding are not registered and do not have published instrument approach procedures, nor does the evidence indicate that similar levels of aircraft movement and public use are present.

⁵²⁶ Exhibit 22665-X0163, Exhibit G to Written Evidence of Conrad Hatcher, page 11.

⁵²⁷ Exhibit 22665-X0198, EDPR SHWF Reply Evidence Summary, page 6, paragraph 18.

⁵²⁸ Exhibit 22665-X0175, CG Information Request Response to CG-AUC-2018MAY03-028(a), page 71.

⁵²⁹ In the *Wiggins v Ontario* decision, the Collingwood Regional Airport had previously held airport certification but at the time of the case was an uncertified aerodrome, and Clearview Field was an uncertified, registered aerodrome: Exhibit 22665-X0162, Tab 2 - *Wiggins v Ontario*, Ontario Environmental Review Tribunal, Case No. 16-036, October 18, 2016, pages 20 and 30.

⁵³⁰ Exhibit 22665-X0162, Tab 2 - *Wiggins v Ontario*, Ontario Environmental Review Tribunal, Case No. 16-036, October 18, 2016, pages 29-30.

8.6 Turbulence, aerial spraying and setbacks

8.6.1 Views of EDP

460. Mr. Hatcher identified a concern regarding the impact of turbulence caused by wind turbines on aircrafts. EDP stated that Transport Canada has not issued any guidelines on this matter. Mr. Sutherland explained the potential turbulence caused by wind turbines as follows:

As I understand it, when the turbine turns with the wind going through it, it creates what's called a "vortex" behind the blade, which means the air cycles in the same direction that the turbine is turning, and that turbulence is going to vary in intensity depending on the speed of the wind going through the turbine, and it's going to dissipate and descend as it goes behind the turbine.

[...] it's going to depend on the direction of the wind, where the aircraft is flying, the velocity of the wind. Yeah, it's going to vary depending on a lot of different factors. So, again, because Transport Canada hasn't addressed it in terms of policy, regulations, or standards or guidance material, there's nothing really I could hang my hat on.⁵³¹

461. Mr. Sutherland acknowledged that TP1247 referred to the need to mark/light wind turbines in accordance with Transport Canada Standard 621, as well as possible impacts on NAV CANADA radar, navigational aids and communications systems. He further acknowledged that NAV CANADA must assess and approve all proposals for land use near airports and air navigation infrastructure before construction begins, but stated that the project is not being located near airports or air navigation infrastructure.

462. Some Clearview Group members raised concerns with aerial spraying within the project area. EDP stated that aerial spraying is not common or frequent in the project area. EDP explained that it was also not made aware of any aerial spraying operations in proximity to the project during its consultation, however, it made the following commitment:

[EDP] will commit to consult with aerial spraying companies/individuals to discuss proposed locations and timing of spraying activities and associated safety considerations at the time such activities are proposed.⁵³²

463. EDP also committed to maintaining a 1.5-mile semi-circle no turbine buffer from the runway ends for the Larry Ness and Jim Ness airstrips. The Clearview Group contended that the larger setback was applied to the Ness airstrips but not the Jorgenson airstrip. EDP explained that Mr. Larry Ness and Mr. Jim Ness raised their concerns with the airstrips early in the project's timeline, before EDP undertook its participant involvement program. Mr. Jim Ness and Mr. Larry Ness requested the 1.5-mile constraint, to which EDP agreed. EDP explained that the Jorgenson airstrip was brought up in the last stages of the first participant involvement program. Mr. O'Connor, who testified on behalf of EDP, explained how these setbacks came about:

Mr. [Leonard] Jorgenson wasn't even a stakeholder in our [participant involvement program]. We didn't know he had an interest in the project because he lives in Calgary. So we consulted with the landowner, which was Ralph Jorgenson, and he said to me that he didn't think that the wind turbines would be a concern for that particular airstrip. At the time there was no wind sock. Like, there was no way for us to even know there was

⁵³¹ Transcript, Volume 3, pages 509-210, lines 7-12.

⁵³² Exhibit 22665-X0289, Outstanding Undertakings, page 5.

an airstrip there. However, once we consulted with Ralph and we realized there may be an airstrip there, we consulted with [Leonard] Jorgenson.⁵³³

464. Mr. O'Connor stressed that EDP consistently applied TP312 to all airstrip owners. Even though the three airstrips are not certified airports, or even registered aerodromes, EDP still considered the standards for OLS identified in TP312 when planning the locations of wind turbines for the project in their vicinity.

465. Mr. Sutherland stated that the pilots using the aerodromes in the project area would not be put in harm's way as a result of the positioning of the turbines. He further stated:

The provisions that EDP made for safe arrival and departure areas for all the runways that were of concern to the Clearview Group have been maintained. And in VFR flight, the visibility of the towers should not be a factor. They should be able to avoid them and continue to operate aircraft in and out of the airstrips.⁵³⁴

466. Mr. Sutherland concluded that the three airstrips' runways would continue to be available for safe aircraft operations for arrivals and departures.

467. EDP submitted that the Clearview Group's suggestion to impose a 4,000-metre setback from each of the private airstrips would have no basis in aviation law and would result in the Commission choosing one land use over another. EDP argued that if this were applied, landowners located up to 4,000 metres from each airstrip would be dramatically restricted in how they are able to develop their own land, simply because their neighbours have an interest in flying private airplanes in the area. EDP further argued that additional setbacks would be an unwarranted restriction on the rights of a private land owner.

468. Finally, EDP submitted that the evidence presented by Mr. Sutherland regarding aviation matters should be preferred over that of Mr. Hatcher. It stated that while Mr. Hatcher is clearly an experienced pilot with expertise in visual flight rules, he did not appear to be familiar with the guidelines that were at issue in this proceeding and his report was based on an out-of-date version of TP312.⁵³⁵

8.6.2 Views of the Clearview Group

469. Mr. Hatcher raised concerns about turbulence created by the wind turbines. Mr. Hatcher explained that the problem with turbines is that unlike a static obstruction, turbines have their own wake. He stressed that the project's turbines would be especially large and he has flown behind smaller ones in Ontario which created significant turbulence.

470. Some Clearview Group members raised concerns with the project impacting ability to aerial spray their agricultural land.

471. Mr. Sheldon Kroker explained that aerial spraying is a one-in-10 or one-in-15-year event that has been required when there were wet conditions that caused his land to be inaccessible by ground sprayer. He expressed concerns about potentially having to work with EDP to co-ordinate

⁵³³ Transcript, Volume 2, page 271, lines 1-11.

⁵³⁴ Transcript, Volume 3, pages 591-592, lines 23-5.

⁵³⁵ Transcript, Volume 5, page 1215, lines 4-11.

spraying because he would have a very short window of time to spray when it comes to certain crop diseases. He also explained that he has looked at using drone spraying in the past.

472. Mr. Jim Ness also raised concerns with aerial spraying near the project. Mr. Jim Ness and Mr. Larry Ness estimated that they have had to aerial spray twice in the past 10 years. Mr. Jim Ness stated:

For 25 years my brother and I sprayed our crops with an ag plane and if special weather conditions require aerial application we can still call in custom operators. Custom aerial applicators will not fly fields in proximity to large power lines and wind turbines. Unless wind turbine # 66 is removed it eliminates the option of aerial application on section 35-31-5 W4 and the east half of sec. 26-31-5 W4. When turning with an ag plane at the end of a field pass you need a full ½ mile for turning and lining up plus another ½ mile for safety.⁵³⁶

473. Mr. Hatcher explained that agricultural application is an extremely intense and potentially dangerous activity that would be made even more so by the addition of 200-metre tall turbines which would create an obstruction and air turbulence hazard. He stated that aircraft engaged in spraying crops cannot follow standard circuit patterns because they apply the chemical agent where it is needed on the property. He contested that a setback of four kilometres from the Ness aerodromes would be required to create an acceptable margin of safety for the aircraft to operate. Mr. Hatcher also advised that Turbine 66 would be an obstruction and an impediment to aerial spraying on Mr. Jim Ness's property, even if the turbine was shut down during spraying.

474. Mr. Hatcher concluded that the pilots using the three airstrips would be in harm's way as a result of the positioning of the turbines. He stated that the proposed position, height and proximity of the turbines to the three airstrips so drastically removes the buffers of safety built into the aerodrome circuit system that safety would be compromised. He stressed that the result would be a threat to aircraft and human safety.⁵³⁷

475. Further, the Clearview Group noted that EDP proposed a larger setback from the Larry Ness and Jim Ness airstrips as a result of a commitment given to the Nesses. Mr. Hatcher stated that there is no justification, from a safety perspective, for applying different setbacks to different aerodromes. He said that safety should be the overriding priority and, should the Commission approve the project, the larger setback should also be applied to the Jorgenson aerodrome.

476. The Clearview Group argued that the Commission should deny the 21 turbines proposed to be constructed within four kilometres of the three airstrips. In particular, the Clearview Group submitted that turbines 74 to 77 should be denied because they are too close to the Jorgenson airstrip.

477. Finally, the Clearview Group argued that while Mr. Sutherland is an airport expert, Mr. Hatcher is a flying expert and a pilot. The Clearview Group contended that Mr. Sutherland's area of expertise is airports, which is not relevant because the Clearview Group is not arguing that the three airstrips are airports. The Clearview Group stated that Mr. Sutherland's expertise about airports is neither here nor there in relation to the three airstrips.⁵³⁸ The Clearview Group

⁵³⁶ Exhibit 22665-X0151, Tab 7 - Statement of Jim Ness, page 2.

⁵³⁷ Exhibit 22665-X0170, Tab 1 - Written Evidence of Conrad Hatcher, page 39, paragraph 89.

⁵³⁸ Transcript, Volume 5, page 1282, lines 2-13.

argued that Mr. Hatcher's evidence should be preferred to Mr. Sutherland's because "Mr. Hatcher is the pilot" while "Mr. Sutherland is an airport guy."⁵³⁹

8.6.3 Commission findings

478. The Commission is satisfied that EDP's commitment to consult with aerial spraying companies and individuals to discuss proposed locations and timing of spraying activities and associated safety considerations at the time such activities are required is adequate to ensure the safety of those operations. The Commission is of the view that because aerial spraying is completed infrequently on the Clearview Group members' lands, it would be reasonable to consult with EDP to request that turbines can be shut down to provide better aerial access.

479. The Commission will not grant the request from the Jorgensons to have the same separation distance from turbines as provided to the Ness airstrips. The Commission is not convinced that an additional separation distance is required because the TP312 OLS at the Jorgenson airstrip will not be penetrated by any turbines.

480. The Commission is of the view that EDP has sited the project turbines at sufficient distances from the three airstrips to allow the three airstrips to be operated safely. The Commission finds there is no basis upon which to alter the placement of turbines due to aeronautical impacts as requested by the Clearview Group.

9 Health and safety

9.1 Views of EDP

481. In response to concerns raised about the project's impacts on human health, EDP submitted that the Clearview Group did not present any evidence to demonstrate that there would be health concerns created by the project.

482. EDP referenced a large-scale Government of Canada study completed in 2012 in collaboration with Statistics Canada, called the *Wind Turbine Noise and Health Study*. EDP explained that the study was completed in Ontario and Prince Edward Island where there were homes in the vicinity of wind turbine installations. It stated that the study concluded that wind turbine noise was not observed to be related to human health impacts, as demonstrated by hair cortisol concentration (which is indicative of stress level), blood pressure, resting heart rate or measured sleep.⁵⁴⁰

483. EDP pointed out the Commission's consistent finding in various decisions on wind project applications that noise, including low frequency noise, from wind power projects that are in compliance with the PSLs prescribed by Rule 012 would not result in adverse health effects for nearby residents or livestock. EDP stated that the project would be fully compliant with Rule 012, and accordingly, it would not adversely impact the health of the Clearview Group, other residents or livestock in proximity to the project area.

484. With respect to the Clearview Group's concerns about shadow flicker, EDP explained that shadow flicker occurs when the blades of a wind turbine pass in front of the sun to create a

⁵³⁹ Transcript, Volume 5, page 1284, lines 11-14.

⁵⁴⁰ Exhibit 22665-X0072, Attachment 2 - Appendix B to E -Part 2 of 13, page 26.

recurring shadow on an object. To help evaluate the impact of shadow flicker, EDP completed a shadow flicker map for the project.⁵⁴¹ EDP asserted that the modelled shadow flicker took into consideration the size and location of the wind turbines, site topography, the sun's path in the sky, the probability of sunshine, and the anticipated operational frequency and orientation of the turbines. The shadow flicker map had contours that predicted the locations where shadow flicker would occur at rates of 15 hours per year and eight hours per year.

485. EDP stated that no shadow flicker regulations exist in Alberta. EDP further stated that Health Canada suggested it is not necessary to model shadow flicker at distances more than two kilometres from a wind turbine, because shadow exposure would dissipate before reaching dwellings at this distance. EDP explained that in the United States, guidelines from the National Association of Regulatory Utility Commissioners restricts shadow flicker to not more than 30 hours per year or 30 minutes per day at occupied dwellings. In Germany, the *Federal Emission Control Act* stipulates worst case limits of 30 hours per year and 30 minutes per day, and a real case limit of eight hours per year.⁵⁴²

486. In response to Mr. Barry Wagstaff's concern with the number of hours per day of shadow flicker that may be experienced, EDP submitted that the Wagstaffs' residences would all be well outside the eight-hour per year contour as depicted on the shadow flicker map.⁵⁴³

487. In response to Ms. Kelly Kroker's concerns regarding the potential effects of shadow flicker, EDP stated that her residence would be approximately three kilometres from the nearest wind turbine and, as a result, the intensity of the shadow from the turbine would be very weak and difficult to distinguish with the human eye.⁵⁴⁴

488. With respect to the safety concerns raised by the Clearview Group, EDP stated that in the unlikely event of a wind turbine fire, the fire-monitoring sensors located in the affected turbine would trigger fire alarms at both the on-site operations and maintenance centre and the remote operations centre to enable immediate response. EDP consulted with the fire chief and deputy director of emergency operations for the Special Areas Board and is committed to developing a site-specific emergency response plan prior to commencing construction of the project. As part of the emergency response plan, firefighting and detection equipment would be available in all project buildings and staff vehicles. In addition, EDP stated it would maintain an up-to-date list of residents in the project area, which would be used to notify residents of fire or other emergency situations.

489. With respect to potential ice impacts, EDP explained that the project's turbines would be able to detect ice build-up on the blades using imbalance sensors. The sensors would register the formation of ice on turbine blades and automatically shut down the wind turbine generator until the sensors and/or on-site staff determine that the blades are free of ice. EDP stressed that the setbacks used in the project design resulted in the placement of turbines at distances from residences and roads that would be sufficient to protect the public from the risks of ice throw or ice shedding. EDP stated that as a result of the sensors and setbacks, ice impacts would be

⁵⁴¹ Exhibit 22665-X0100, Attachment 2B - Appendix S to U - Amendment Part 14, page 6.

⁵⁴² Exhibit 22665-X0289, Outstanding Undertakings, page 2.

⁵⁴³ Transcript, Volume 5, pages 1215-1216, lines 25-7.

⁵⁴⁴ Exhibit 22665-X0198 EDPR SHWF Reply Evidence Summary, page 13, paragraph 48.

prevented and the probability of damage or injury resulting from ice throw or ice shedding would be extremely low.⁵⁴⁵

490. EDP explained that a third-party engineer would certify that the turbine foundations were designed in accordance with applicable standards and that the project's turbines would be certified to meet international standards to ensure their structural integrity. EDP stated that turbine vendors, prior to sale and issuing warranties, review the on-site wind meteorological data and complete a mechanical loads analysis to determine turbine suitability for the specific site.⁵⁴⁶

491. EDP explained that the project's turbines would be designed to meet the following extreme design parameters:

- A sustained 10-minute average wind speed of 135 kilometres/hour.
- A three-second wind gust of 189 kilometres/hour.⁵⁴⁷

492. EDP also discussed a number of safety procedures that would occur if extreme wind conditions are detected, including altering the angle of the turbine blades and ceasing operation.

9.2 Views of the Clearview Group

493. Clearview Group members expressed concerns regarding the project's potential health and safety impacts, including those resulting from noise and infrasound, shadow flicker, and the project's emergency response plan.

494. Many members of the Clearview Group raised potential health concerns caused by the project, including how it may impact pre-existing health conditions.

495. Ms. Kelly Kroker stated that she was concerned with many potential health impacts including sound and infrasound causing headaches and sleep disorders. Ms. Juanita Wagstaff stated that:

For me, my largest and most unanswered concern is the health factors that have had no long-term studies to satisfy or prove the safety of the size of the wind turbines being built on [...] lands that are adjacent to our properties that we own.⁵⁴⁸

496. Mr. Sheldon Kroker added that:

Countless studies showing detrimental effects on human health are always shelved by decision-makers because of the lack of sufficient evidence and information. Why does anyone with concerns have to try and prove that the effects are legitimate. As individuals, we neither have the resources nor the opportunity to do a complete study before the project gets its final approval.

The proponents should have to prove there are no health risks before project approval.⁵⁴⁹

⁵⁴⁵ Exhibit 22665-X0198 EDPR SHWF Reply Evidence Summary, page 16, paragraph 64.

⁵⁴⁶ Exhibit 22665-X0294, 22556 Sharp Hills IR Response 4 V1.0 18JUN2018, page 5.

⁵⁴⁷ Exhibit 22665-X0294, 22556 Sharp Hills IR Response 4 V1.0 18JUN2018, page 5.

⁵⁴⁸ Transcript, Volume 3, page 712, lines 4-8.

⁵⁴⁹ Transcript, Volume 3, page 638, lines 12-19.

497. Mr. Sheldon Kroker also stressed that “We don’t want to be the guinea pigs for a piece of equipment that has very little data and research completed upon it.”⁵⁵⁰

498. Clearview Group members also raised concerns with shadow flicker. For example, Mr. Barry Wagstaff was concerned that he and his family may experience 12 to 13 hours per day of shadow flicker in the summer months and seven to eight hours per day during the winter months.⁵⁵¹

499. Ms. Kelly Kroker also expressed concerns regarding the potential effects of shadow flicker. She testified that she owns and works land directly adjacent to the project area and therefore the shadow flicker from turbines 56, 57, 59, 60, possibly 61 and 65 could impact her.

500. Ms. Juanita Wagstaff and Mr. Aaron Rude also testified about concerns with the strobing effect from turbines impacting people with previous concussions.

501. Mr. Nelson Hertz testified about the project’s potential for accidents such as fire and ice throw. He took issue with the project not having an established emergency response plan or emergency procedures. He also testified that the emergency responses in the area are based on volunteers, which causes the number of available firefighters and response times to vary. He explained that a large scale emergency would devastate the area.

9.3 Commission findings

502. The Clearview Group raised potential health concerns relating to noise and infrasound, shadow flicker, and the project’s emergency response plan. The Commission notes that neither EDP nor the Clearview Group provided expert evidence regarding the project’s potential health impacts.

503. The Commission notes that the Health Canada *Wind Turbine Noise and Health Study* referenced by EDP has been presented as evidence in a number of previous proceedings and considered by the Commission in prior decisions. The Commission has also considered in previous proceedings whether projects in compliance with the nighttime PSL thresholds as prescribed in Rule 012 are likely to result in adverse health effects for nearby residents.⁵⁵² The Commission cannot conclude, based on the evidence on the record of this proceeding, that noise from the project is likely to cause adverse health effects to residents in or near the project area, as long as the project operates in compliance with the PSLs in Rule 012.

504. EDP’s shadow flicker map outlined areas where shadow flicker could occur. No contrary evidence was provided by the Clearview Group to indicate that shadow flicker would be an issue at their residences. While the Commission recognizes that shadow flicker could occur when

⁵⁵⁰ Transcript, Volume 3, page 636, lines 2-5.

⁵⁵¹ Transcript, Volume 3, page 707, lines 12-15.

⁵⁵² Decision 2014-040 (Errata): 1646658 Alberta Ltd. – Bull Creek Wind Project, Proceeding 1955, Application 1608556, March 10, 2014, paragraphs 387-397; Decision 3329-D01-2016: E.ON Climate & Renewables Canada Ltd. – Grizzly Bear Creek Wind Power Project, Proceeding 3329, Applications 1610717-1 and 1610717-2, May 19, 2016, paragraphs 248-270; Decision 22563-D01-2018: Capital Power Generation Services Inc. – Halkirk 2 Wind Power Project, Proceeding 22563, Applications 22563-A001 and 22563-A002, April 11, 2018, paragraphs 218-219; Decision 22966-D01-2018: BHEC-RES Alberta G.P. Inc. – Forty Mile Wind Power Project, Proceeding 22966, Application 22966-A001, August 30, 2018, paragraph 226.

Clearview Group members are near turbines, such as in fields adjacent to the project, there was no expert evidence submitted to the effect that there may be any negative health impacts.

505. Based on the record of this proceeding, the Commission finds no persuasive evidence that the project, operating as proposed in the application, is likely to result in adverse health effects for nearby residents.

506. With respect to the safety concerns raised by the Clearview Group, the Commission accepts EDP's submission that it will develop a site-specific emergency response plan prior to commencing construction of the project. The Commission acknowledges that EDP consulted with the local fire chief in the project area. The Commission finds that EDP's approach to developing an emergency response plan, particularly as it applies to potential turbine fires, is adequate.

507. Similarly, the Commission finds that the evidence before it indicates that there is a low risk that ice shedding or ice throw events will create a public safety issue. EDP's assurance that the project turbines will be equipped with sensors able to detect ice build-up, coupled with the turbines' placement in relation to residences and roads, indicates to the Commission that the likelihood of an ice throw or shedding event occurring, or causing damage should it occur, is low. The Commission is satisfied that with the monitoring and safety measures proposed by EDP, possible ice events from wind turbines can be adequately mitigated.

10 Property value and land use concerns

10.1 Views of EDP

508. EDP acknowledged that it had received concerns during its participant involvement program regarding the impact of the project on property values. EDP mailed out a frequently asked questions package to everyone within 2,000 metres of the project boundary. In the package, EDP noted that "a study completed by the Municipal Property Assessment Corporation (MPAC) in Ontario found that there is no impact from proximity to wind turbines on property sale prices."⁵⁵³

509. EDP also identified two recent wind farms approved by the Commission with similar conclusions. EDP referenced Decision 3329-D01-2016 for the Grizzly Bear Creek Wind Project, where the Commission found that it "was not presented with sufficient evidence in this proceeding to suggest that the project will result in an adverse impact on property values of parcels adjacent to the project."⁵⁵⁴ EDP also referenced Decision 2014-040 (Errata) for the Bull Creek Wind Project, where the Commission similarly concluded that:

The Commission has not been presented with sufficient cogent evidence in this proceeding to suggest that the project will result in an adverse impact on property values of parcels adjacent to the project and finds that any limitations on subdivision potential is too speculative.⁵⁵⁵

⁵⁵³ Exhibit 22665-X0072, Attachment 2 - Appendix B to E -Part 2 of 13, page 28.

⁵⁵⁴ Decision 3329-D01-2016: E.ON Climate & Renewables Canada Ltd. – Grizzly Bear Creek Wind Power Project, Proceeding 3329, Application 1610717, May 19, 2016, paragraph 310.

⁵⁵⁵ Decision 2014-040 (Errata): 1646658 Alberta Ltd. – Bull Creek Wind Project, Proceeding 1955, Application 1608556, March 10, 2014, paragraph 533.

510. In response to the Clearview Group's concerns that the Ontario Teachers' Pension Plan (OTPP) had turned down acquiring land in the project area, EDP noted that:

[T]he OTPP owns interests in various renewable energy generation assets as well as transmission lines that enable renewable energy development. In particular, OTPP owns shares in Anbaric Development Partners (clean energy transmission developer), BluEarth Renewables (Alberta-based renewable energy company), and Cubico Sustainable Investments (renewable energy investor). Investing in these projects would indicate OTPP support[s] renewables projects.⁵⁵⁶ [footnotes omitted]

511. EDP also emphasized that none of the proposed wind turbines or associated project infrastructure would be constructed on the Clearview Group members' properties, and that the Clearview Group residence closest to the project would be located more than 1,850 metres from the proposed wind turbine locations.⁵⁵⁷

512. EDP submitted that it had not identified any reliable information indicating that properties surrounding wind projects suffer a loss in value, and it had no information indicating that the project would have any impact on property values.⁵⁵⁸

513. EDP explained that the project is fully compliant with the setbacks contained in the Special Areas Land Use Order.⁵⁵⁹ The Special Area Land Use Order includes the requirement for turbines to be located the greater of:

- (a) A 550-metre setback distance from the property line of a non-participating landowner; or
- (b) A distance at which the modelled sound level is not exceeding the AUC dwelling setback requirement measured from the nearest property line to the nearest tower base.

514. EDP stated that by requiring compliance with Rule 012 modelled PSLs at the property line, rather than at the residences of non-participating landowners, the Special Areas Land Use Order often required a larger setback from non-participating residences than prescribed by Rule 012.

515. EDP also noted that the Clearview Group raised concerns with the project regarding road impacts, farming impacts and telecommunications interference. In response to concerns with road impacts, EDP explained that it committed to entering into a Road Users Agreement with the Special Areas Board to ensure that the condition of public roads used in the construction of the project would be left in the same or better condition than existed prior to construction.

516. In response to concerns regarding farming impacts, EDP stated that wind farm operations and farming practices co-exist very well. Based on its past experiences, EDP stated that farmers can cultivate close to the base of the turbines, and grazing lands have remained in use in the same manner as before construction.

517. EDP completed a telecommunications interference assessment study, which formed part of its constraints analysis when designing the project. If local residents experience problems with

⁵⁵⁶ Exhibit 22665-X0198, EDPR SHWF Reply Evidence Summary, page 13, paragraph 51.

⁵⁵⁷ Exhibit 22665-X0198, EDPR SHWF Reply Evidence Summary, page 14, paragraph 52.

⁵⁵⁸ Transcript, Volume 5, page 1216, lines 15-20.

⁵⁵⁹ Exhibit 22665-X0198, EDPR SHWF Reply Evidence Summary, pages 3-4, paragraph 6.

telecommunications services subsequent to the construction and operation of the project, EDP committed to working with the individual to investigate any concerns.

518. EDP submitted that the project would benefit the community. EDP stated that the project represents a significant capital investment in the Special Areas, and would contribute to economic development in the region. It stated that participating landowners would be able to diversify the sources of income for their families and spend additional income in the community. EDP also submitted that its property taxes would increase overall annual tax revenue to the Special Areas Board. Therefore, EDP stated that the benefits created by the project would not be limited to participating landowners, but extend to all members of the community.

519. In addition, EDP explained that the project is expected to generate a significant number of employment opportunities, including approximately 300 jobs during the project's construction phase, and approximately 15 to 20 permanent, local jobs during its 20 to 30 year operational life. EDP expressed its intention to work with local contractors for road maintenance, cleaning, vegetation management, catering, and other services throughout the life of the project. In this regard, it hosted a supply chain open house in the town of Oyen on April 12, 2018, to assist in the identification of local businesses that can provide services to the project.⁵⁶⁰

10.2 Views of the Clearview Group

520. The Clearview Group raised concerns regarding the devaluation of agricultural land, impacts on residential value and land depreciation as a result of the project.

521. Many Clearview Group members raised concerns that land values would decrease as a result of the project, and they wanted a guarantee that they would be compensated for any depreciation should that prove to exist. Ms. Dawne Beaudoin testified:

I have a deep concern with property values declining in our area because of these turbines. Because our farm is our retirement and if selling our farm does not meet our financial goals because of the property values, would there be assurance that we, the landowners, will be fairly compensated for our loss, because I've spent a lifetime, a lifetime, building this place, and I don't want to leave.⁵⁶¹

522. Ms. Kelly Kroker submitted that “[m]any reports [say that] land values decline and yet again we are told, You can't prove that! Think about that.....this company now has a caveat on your land and can dictate what you can do on YOUR land and who YOU can sell it to. Would you want to buy that piece of land HELL NO!!!”⁵⁶²

523. The Clearview Group submitted that “a review of previous AUC decisions disclosed that the Commission has never accepted that any electric facility (power plant, transmission line, substation) has an adverse effect on property values. Nevertheless, the Clearview Group maintains its view that there is an adverse effect.”⁵⁶³ The Clearview Group mentioned that as an example of negative impact on property values, the OTPP had recently passed on an opportunity

⁵⁶⁰ Exhibit 22665-X0198, EDPR SHWF Reply Evidence Summary, page 20.

⁵⁶¹ Transcript, Volume 3, page 729, lines 16-24.

⁵⁶² Exhibit 22665-X0153, Tab 5 - Statement of Kelly Kroker, pages 1-2.

⁵⁶³ Exhibit 22665-X0158, Submissions of the Clearview Group, page 10, item 6.

to acquire land south of the Sharp Hills project area when it learned that there was another wind project proposed for some of the lands.⁵⁶⁴

524. Mr. Bryan Kroker raised concerns regarding impacts to roads in the project area. He explained that excess transportation of heavy loads would take its toll and could cause dilapidated roads. He also testified that access to landowners' property would also suffer.

525. The Clearview Group also expressed concerns regarding the project's potential impacts on telecommunications services. Mr. Simpson stated that because they are remotely located, use of cell phones and internet is the way of doing business.⁵⁶⁵ This was also brought forth by Ms. Beaudoin who stated that she runs a bookkeeping business from her home that relies on internet service for billable hours.

526. The Clearview Group submitted that the project has already had a profound impact on the community, dividing it among participating and non-participating landowners. It argued that the social effects of the project on the multi-generational community would be severe and long lasting.⁵⁶⁶

10.3 Commission findings

527. With respect to the project's potential impact on property values, the Commission was not presented with sufficient evidence in this proceeding to conclude that the project will result in an adverse impact on property values for parcels adjacent to the project. With respect to the concerns raised by the Clearview Group that the OTPP recently turned down the opportunity to acquire land in the area, the Commission does not consider that there is sufficient evidence on the record to demonstrate that the OTPP did so because of the presence of the project or other proposed projects in the area. There is also insufficient evidence to draw a conclusion that the OTPP's decision indicates, or has had the effect of, lowering property values. The Commission cannot conclude based on the evidence before it, that the project will depress property values in the area.

528. The Commission finds that EDP's approach to mitigate potential road impacts and telecommunication impacts is reasonable. In arriving at this conclusion, the Commission has taken into account EDP's commitment to enter into a Road Users Agreement with the Special Areas Board, and to work with local residents should they experience problems with telecommunications services after construction and operation of the project.

529. Further, the Commission finds that there was insufficient evidence presented to show that land use, including agricultural operations, would be impacted by the project, particularly given that no components of the project will be sited on non-participating landowners' property.

530. The Commission acknowledges and accepts the Clearview Group's submissions that the project has divided the community among participating and non-participating landowners. The Commission recognizes that projects of this magnitude can cause a division in the community and is aware that there are people in the community both in favour of and opposed to the project.

⁵⁶⁴ Exhibit 22665-X0158, Submissions of the Clearview Group, page 10, item 6.

⁵⁶⁵ Exhibit 22665-X0149, Tab 9 - Statement of Wyatt Simpson, page 1.

⁵⁶⁶ Transcript, Volume 5, page 1298, lines 9-13.

This is clear from the letters of support for the project filed on the record,⁵⁶⁷ as well as the concerns raised by the Clearview Group.

531. However, the Commission also notes that the Special Areas Board appears to have contemplated the potential for the development of wind generation projects within Special Area 3 and Special Area 4, as evidenced by the setbacks and other land use constraints that are set out in its Land Use Order as applicable to “wind energy conversion projects.”⁵⁶⁸ There is no evidence on the record of this proceeding that the Special Areas Board objects to the project; instead, it is apparent that the project will be subject to the existing land use constraints and application process set out in the Special Areas Board Land Use Order.

532. The Commission will weigh the social impact of the project on the community in its overall determination of whether the project is in the public interest having regard to the social, economic, and other effects of the project, including its effects on the environment. However, this social impact must be weighed against the other social benefits of the project, such as additional tax revenues for the Special Areas Board and job creation, and in light of the fact that the project is being developed on private land upon which landowners have given their consent for the use of their land. In this instance, the Commission is not convinced that the negative social impacts raised by the Clearview Group are outweighed by the social benefits of the project.

533. As noted, the proposed project is located within Special Area 3 and Special Area 4, and accordingly is subject to applicable Special Areas Board land use requirements. With respect to siting the project turbines, PP14 of Rule 007 provides that, if approval for the project is granted, an applicant may relocate a turbine up to 50 metres from the applied-for location without reapplying to the Commission for approval of that change.⁵⁶⁹ If approval for the project is granted and EDP determines that relocation of a turbine is required, the Commission directs EDP to also take any applicable land use constraints into consideration, including applicable Special Areas Board Land Use Order setbacks, when determining a turbine’s new location.

11 Interconnection

534. EDP applied to interconnect the Sedalia 363S Substation to a proposed ATCO Electric Ltd. (ATCO Electric) substation designated as the New Brigden 2088S Substation. The interconnection would be located in the southwest quarter of Section 16, Township 32, Range 5, west of the Fourth Meridian. EDP explained that ATCO Electric’s New Brigden 2088S Substation would be the subject of a separate facility application.

11.1 Commission findings

535. The Commission recognizes that EDP has applied for the connection of the Sedalia 363S Substation to ATCO Electric’s proposed New Brigden 2088S Substation. A separate proceeding, Proceeding 23066, includes the Alberta Electric System Operator’s needs identification document for the Sharp Hills Wind Farm Connection, ATCO Electric’s application to construct

⁵⁶⁷ Exhibit 22665-X0134, Sharp Hills Wind Farm - AUC Proceeding 22665 Project Support Letters.

⁵⁶⁸ Exhibit 22665-X0145, Tab 13 - Schedule C to Ministerial Order No. MSL 007 15 Amendment to Special Areas Board Order, Section 49, page 12.

⁵⁶⁹ Rule 007: *Applications for Power Plants, Substations, Transmission Lines, Industrial System Designations and Hydro Developments*, page 12, item PP 14.

the New Brigden 2088S Substation, and ATCO Electric's request to connect the Sedalia 363S Substation to ATCO Electric's proposed New Brigden 2088S Substation. Because there are two separate proceedings for the connection, the Commission defers its decision on the connection of the Sedalia 363S Substation to ATCO Electric's proposed New Brigden 2088S Substation to Proceeding 23066.

12 Summary of findings and conclusion

536. The Commission explained the legislative scheme in place for the consideration and approval of power plants in Alberta in Section 3 of this decision. In this section, the Commission applies that legislative scheme in light of the findings it has made above.

537. In accordance with Section 17 of the *Alberta Utilities Commission Act*, the Commission must decide whether approval of the project is in the public interest having regard to its social and economic effects and its effects on the environment.

538. The Commission concludes that EDP's consultation and participant involvement program satisfies the regulatory requirements of Rule 007.

539. Regarding the social and economic effects of the project, the Commission finds that the construction and operation of the project is not likely to cause adverse health effects to residents in or near the project area, and the Commission does not consider that the project will affect the safety of residents, based on the monitoring and safety measures proposed by EDP. With regard to property value impacts, the Commission cannot conclude, based on the evidence before it, that the project will depress property values in the area, nor that land use such as agricultural operations will be impacted by the project. Although the Commission acknowledges that the project will have a significant visual impact on the area, and further acknowledges that projects of this magnitude can cause a division in the community, the Commission considers that these social impacts must be weighed amongst others and are not, in and of themselves, prohibitive. With regard to aeronautical impacts, the Commission finds that EDP has sited the project turbines at sufficient distances from the three airstrips at issue to allow them to be operated safely.

540. Regarding the environmental effects of the project, the Commission has considered the evidence on the record of this proceeding, including the various commitments made by EDP, the mitigation and monitoring plans established by EDP in consultation with AEP, and the project's adherence to applicable regulatory standards, directives and guidelines. The Commission finds that the potential adverse environmental effects from construction and operation of the project can be adequately mitigated with application of the conditions outlined below.

541. The Commission concludes that noise from the project is expected to satisfy the nighttime and daytime PSL values at all receptors and the project is unlikely to cause an LFN condition at any noise receptor. However, the Commission will require EDP to conduct a post-construction CSL survey.

542. Having regard to the foregoing, the Commission finds that the negative effects of the project, which include social impacts, visual impact, noise and impacts to the environment, can be mitigated to an acceptable degree.

543. Because there are two separate proceedings for the connection, the Commission defers its decision on the connection of the Sedalia 363S Substation to ATCO Electric's proposed New Brigden 2088S Substation to Proceeding 23066.

544. The Commission is satisfied that approval of the project is consistent with the purposes of both the *Hydro and Electric Energy Act* and the *Electric Utilities Act* in that it will result in the safe, economic, orderly and efficient development of a new generation facility that will contribute to an efficient electricity market based on fair and open competition.

545. For the reasons discussed, the Commission finds that approval of the project is in the public interest, in accordance with Section 17 of the *Alberta Utilities Commission Act*.

546. The Commission's decision to approve the project is subject to the following conditions:

- EDP shall abide by all of AEP's requirements, recommendations, and directions outlined in the referral reports⁵⁷⁰ and any additional commitments made in its correspondence with AEP⁵⁷¹ and its undertaking response⁵⁷² to the Commission. This includes keeping the project's wildlife data current until the project is commissioned by updating the pre-construction wildlife field surveys when they expire. As necessary, EDP shall continue to consult with AEP throughout construction and operation of the project, and implement any additional mitigation measures recommended by AEP.
- EDP shall abide by all of the commitments and recommendations included in its final version of the Construction and Operation Mitigation Plan developed for the project. EDP shall implement all mitigation measures identified in the Construction and Operation Mitigation Plan and monitor the effectiveness of its mitigation measures. If mitigation measures are unsuccessful, EDP, in consultation with AEP, must develop and implement additional mitigation to minimize adverse effects on the environment.
- If any ACIMS S1 or S2 ranked rare plants or ecological communities are discovered on or within 30 metres of the project's construction footprint during future pre-disturbance field work, then the Commission directs EDP to avoid these vulnerable features. If avoidance is not possible, then EDP shall develop mitigation measures in consultation with AEP to reduce the project's potential adverse effects on these plant species.
- The Commission directs EDP to prepare a comprehensive Native Grassland Post-Construction Reclamation and Restoration Plan in consultation with AEP. This plan will provide details about how the project will successfully restore areas of native vegetation disturbed during construction to a healthy mid-to-late seral stage native grassland plant community. The finalized version of this plan must be submitted to the Commission by the end of the project's construction phase.
- The Commission directs EDP to conduct post-construction monitoring of soil health and vegetation re-establishment for a period to be determined in consultation with AEP.

⁵⁷⁰ Exhibit 22665-X0005, Attachment 6 - AEP Referral Report; Exhibit 22665-X0056.02, Attachment 5 - Alberta Environment and Parks Referral Report.

⁵⁷¹ Exhibit 22665-X0120, Attachment CVIR1-024-01 - AEP Correspondence Part 1 of 2; Exhibit 22665-X0121, Attachment CVIR1-024-01 - AEP Correspondence Part 2 of 2.

⁵⁷² Exhibit 22665-X0289, Outstanding Undertakings.

Should monitoring results indicate that reclamation efforts are unsuccessful, EDP shall implement mitigation measures in consultation with AEP.

- The Commission directs EDP to micro-site Turbine 9 and its associated access road, collector line, and workspace to attempt to further reduce the amount of native grassland disturbance during construction and operation.
- The Commission directs EDP to implement a native grassland conservation offset equal to or greater than the amount of native grassland temporarily or permanently disturbed through construction and operation of the project, and confirm in writing to the Commission that this condition has been fulfilled, within one year of commencing operation.
- Prior to any construction related ground disturbance that occurs within 100 metres of any Class 3 to Class 5 wetland, EDP shall consult with AEP about the completion of any additional amphibian pre-construction surveys. If AEP recommends additional surveys, EDP must conduct the surveys, notify AEP of the results and implement any mitigation measures recommended in consultation with AEP if any amphibian species at risk are detected.
- The siting, construction and operation of the project's infrastructure shall meet all of AEP's recommended minimum setbacks for both wetlands and watercourses and wildlife species at risk habitat features for the project, unless AEP has agreed to: a reduced setback; alternative mitigation in the project's referral reports; or approval under the *Water Act* for the project.
- EDP shall abide by any requirements and commitments outlined in its final version of the PCM Plan developed for the project unless otherwise directed by AEP. EDP shall submit to the Commission annually a copy of the project's post-construction wildlife monitoring report along with correspondence from AEP summarizing its views on the report for a minimum of three years, as outlined in EDP's PCM Plan, and any additional period as specified by AEP.
- EDP shall implement mitigation measures, in consultation with AEP, if the results of the post-construction bat carcass monitoring program indicate that the estimated corrected rate of bat fatalities for the project exceeds an average of four fatalities per turbine per year, or any other lower threshold included in the PCM Plan or required by AEP. Additionally, EDP shall implement mitigation measures if the results of the post-construction bat carcass monitoring indicate bat fatalities in the vicinity of any individual turbine are unacceptable to AEP. Mitigation measures may include:
 - Increasing the turbine cut-in wind speed.
 - Stopping blades from idling during low wind speeds not conducive to electricity generation.
 - Feathering or altering the angle of the turbine blades.

- Temporarily shutting down the turbines during certain periods of the year, weather conditions, and/or time of day during which migratory bats are more active or vulnerable to turbine-related mortalities.
- Monitoring advancements made in turbine bat mitigation throughout the life of the project and, in consultation with AEP, implementing any other mitigation methods/technologies as they become commercially available and/or their effectiveness is substantiated over time (e.g., acoustic or electromagnetic deterrents or using radar/infrared photography to detect bats).
- Following completion of the post-construction wildlife monitoring program, EDP shall communicate to AEP the discovery of any carcasses of species at risk which might be observed near project infrastructure during operation or maintenance and, if required, implement any new mitigation measures that AEP may recommend to prevent or reduce further mortalities.
- If any changes are made to the micro-siting of the wind turbines, roads, collector lines, and other infrastructure associated with the project, the construction schedule, or the proposed wildlife mitigation measures, EDP shall submit these changes to AEP for its review to ensure wildlife and wildlife habitat are protected.
- EDP shall conduct a thorough pre-construction nest search survey to identify nests located in trees, on the ground, and around the shores of wetlands. The survey area boundary for this pre-construction nest search survey should be extensive enough to cover AEP's recommended setbacks for the nests of species at risk that may nest within or near the project area. If any nests are detected, EDP shall implement the mitigation measures itemized in its Construction and Operation Mitigation Plan and in consultation with AEP.
- The Commission directs EDP to prepare and submit a study examining the use of radar as a prediction and mitigation tool for project-related bird and bat mortality rates. This study shall identify existing applicable radar technology and, if available, provide examples of where such technology is currently employed, and the results of its deployment. The study shall include a cost estimate for implementing a radar monitoring plan, including the cost of the necessary equipment, monitoring costs, and any costs associated with related mitigation (i.e., manual or automated intervention) for the project. EDP shall file the study by no later than June 21, 2019. The Commission will review the study and, if directed by the Commission as a result of its review, EDP shall implement a radar monitoring program.
- EDP shall complete four years of monitoring (one year during construction and the first three years of operation) during the sharp-tailed grouse lek season assessing the effects of construction and operation of the project on the lek use, nesting success/productivity, and chick survival rates at each of the sharp-tailed grouse lek sites and surrounding nesting habitat present in the project area. The data collected shall be analyzed and presented in an interim report at the end of two years and a final report at the end of the monitoring period. Both reports shall be submitted to the Commission and AEP. If, following its review of the interim report and/or the final report, AEP determines that the project has had an adverse effect on sharp-tailed grouse breeding and survival in the project area,

then the Commission directs EDP to consult with AEP about any additional project mitigation measures that may be required.

- In addition to any representative turbines selected for the project's post-construction bat carcass surveys in consultation with AEP in accordance with the stratified random sample method, EDP shall also survey any turbines that are located near roost sites of tree-roosting migratory bat species, a valley and coulee edge, a ridge system, and areas of foraging habitat that have a higher risk of bat mortality. For the project, this specifically includes turbines 9, 27 to 31, 33, 53A, and 54A and any other turbines that are situated within or near the high wildlife habitat risk areas identified in AEP's August 2017 *Areas of Wildlife Habitat Sensitivity Map*, unless otherwise determined in consultation with AEP. The carcass survey results for any additional turbines monitored under this requirement should not be factored into the corrected bat mortality rate that is generated for the overall project from the carcass survey results for the one third of turbines selected using the stratified random sample method.
- During the project's construction phase and following the first three years of operation, EDP shall annually submit a letter to the Commission explaining the steps taken by EDP to comply with the Commission's approval conditions, and indicating any conditions that remain outstanding.
- EDP shall conduct a post-construction comprehensive sound level survey, including an evaluation of LFN, at receptors R16, R28, and R35. The post-construction comprehensive sound level survey must be conducted under representative conditions and in accordance with Rule 012. EDP shall file all studies and reports relating to the post-construction comprehensive noise survey with the Commission within one year of connecting the power plant to the Alberta Interconnected Electric System.

547. In approving the project, the Commission has considered and relied upon the commitments made by EDP in relation to the project. The Commission expects EDP to follow through on all commitments made during this proceeding. These commitments include, but are not limited to, all of the commitments listed in Exhibit 22665-X0289 and attached as Appendix F to this decision. Should the Commission receive a complaint that EDP has not adhered to its commitments, the Commission may initiate a review in accordance with Rule 016: *Review of a Commission Decision*.

13 Decision

548. Pursuant to sections 11, 14, 15 and 18 of the *Hydro and Electric Energy Act*, the Commission approves the power plant and substation applications and grants EDP the following approvals:

- Appendix 1 – Sharp Hills Wind Farm – Power Plant Approval 22665-D02-2018 – September 21, 2018.
- Appendix 2 – Sedalia 363S Substation – Substation Permit and Licence 22665-D03-2018 – September 21, 2018.

549. The appendices will be distributed separately.

Dated on September 21, 2018.

Alberta Utilities Commission

(original signed by)

Mark Kolesar
Chair

(original signed by)

Tracee Collins
Commission Member

(original signed by)

Joanne Phillips
Commission Member

Appendix A – Proceeding participants

Name of organization (abbreviation) Company name of counsel or representative
EDP T.L. Oleniuk N. Bakker
Clearview Group G. Fitch M. Baldasaro

Alberta Utilities Commission
Commission panel Mark Kolesar, Chair Tracee Collins, Commission Member Joanne Phillips, Commission Member
Commission staff K. Macnab (Commission counsel) J.P. Mousseau (Commission counsel) A. Anderson T. Buhler K. Wen J. Yu

Appendix B – Oral hearing – registered appearances

Name of organization (abbreviation) Name of counsel or representative	Witnesses
EDP T.L. Oleniuk N. Bakker	T. Drew J. Jones T. LoTurco R. McDonnell R. O'Connor S. Sutherland J. VanDerZee T. Whidden
Clearview Group G. Fitch M. Baldasaro	C. Blair B. Kroker L. Kroker S. Kroker K. Kroker W. Simpson D. Beaudoin N. Hertz A. Rude L. Wagstaff B. Wagstaff J. Wagstaff L. Kaumeyer H. Ross S. Petrie C. Wallis C. Hatcher L. Jorgenson C. Jorgenson J. Ness H. de Haan K. Fairhurst

Appendix C – Summary of Commission conditions and directions with required deliverables

This section is provided for the convenience of readers. In the event of any difference between the conditions and directions in this section and those in the main body of the decision, the wording in the main body of the decision shall prevail. The conditions of Approval 22665-D02-2018 which require subsequent filings to the Commission will be tracked using the AUC's eFiling System.

1. The Commission directs EDP to prepare a comprehensive Native Grassland Post-Construction Reclamation and Restoration Plan in consultation with AEP. This plan will provide details about how the project will successfully restore areas of native vegetation disturbed during construction to a healthy mid-to-late seral stage native grassland plant community. The finalized version of this plan must be submitted to the Commission by the end of the project's construction phase..... Paragraph 237
2. The Commission directs EDP to implement a native grassland conservation offset equal to or greater than the amount of native grassland temporarily or permanently disturbed through construction and operation of the project, and confirm in writing to the Commission that this condition has been fulfilled, within one year of commencing operation. This direction will be a condition of Approval 22665-D02-2018 and tracked in the AUC's eFiling System. Paragraph 237
3. EDP shall abide by any requirements and commitments outlined in its final version of the PCM Plan developed for the project unless otherwise directed by AEP. EDP shall submit to the Commission annually a copy of the project's post-construction wildlife monitoring report along with correspondence from AEP summarizing its views on the report for a minimum of three years, as outlined in EDP's PCM Plan, and any additional period as specified by AEP..... Paragraph 251
4. The Commission directs EDP to prepare and submit a study examining the use of radar as a prediction and mitigation tool for project-related bird and bat mortality rates. This study shall identify existing applicable radar technology and, if available, provide examples of where such technology is currently employed, and the results of its deployment. The study shall include a cost estimate for implementing a radar monitoring plan, including the cost of the necessary equipment, monitoring costs, and any costs associated with related mitigation (i.e., manual or automated intervention) for the project. EDP shall file the study by no later than June 21, 2019. The Commission will review the study and, if directed by the Commission as a result of its review, EDP shall implement a radar monitoring program. Paragraph 251
5. EDP shall complete four years of monitoring (one year during construction and the first three years of operation) during the sharp-tailed grouse lek season assessing the effects of construction and operation of the project on the lek use, nesting success/productivity, and chick survival rates at each of the sharp-tailed grouse lek sites and surrounding nesting habitat present in the project area. The data collected shall be analyzed and presented in an interim report at the end of two years and a final report at the end of the monitoring period. Both reports shall be submitted to the Commission and AEP. If, following its review of the interim report and/or the final report, AEP determines that the project has had an adverse effect on sharp-tailed grouse breeding and survival in the project area,

- then the Commission directs EDP to consult with AEP about any additional project mitigation measures that may be required. Paragraph 251
6. During the project's construction phase and following the first three years of operation, EDP shall annually submit a letter to the Commission explaining the steps taken by EDP to comply with the Commission's approval conditions, and indicating any conditions that remain outstanding..... Paragraph 254
 7. EDP shall conduct a post-construction comprehensive sound level survey, including an evaluation of LFN, at receptors R16, R28, and R35. The post-construction comprehensive sound level survey must be conducted under representative conditions and in accordance with Rule 012. EDP shall file all studies and reports relating to the post-construction comprehensive noise survey with the Commission within one year of connecting the power plant to the Alberta Interconnected Electric System.. Paragraph 394

Appendix D – Abbreviations

Abbreviation	Name in full
ACIMS	Alberta Conservation Information and Management System
AEP	Alberta Environment and Parks
AER	Alberta Energy Regulator
ASL	ambient sound level
CONCAWE	Conservation of Clean Air and Water in Europe
CSL	Comprehensive sound level
dB	decibels
Delta Waterfowl	Delta Waterfowl Foundation
dNCL	dBA Noise Consultants Ltd.
EcoLogic	EcoLogic Consultants Ltd.
EDP	EDP Renewables SH Project GP Ltd.
EE Reports	Environmental Evaluation Reports
ESAs	Environmentally Significant Areas
ISO	International Organization for Standardization
LFN	low frequency noise
MW	megawatts
NIA	noise impact assessment
OIS	obstacle identification surface
OLS	obstacle limitation surface
OTPP	Ontario Teachers' Pension Plan
PCM Plan	Post-Construction Fatality Monitoring and Adaptive Management Plan
PSL	permissible sound levels
RDI	RDI Resource Design Inc.
Rule 001	AUC Rule 001: <i>Rules of Practice</i>
Rule 007	AUC Rule 007: <i>Applications for Power Plants, Substations, Transmission Lines, Industrial System Designations and Hydro Developments</i>
Rule 012	AUC Rule 012: <i>Noise Control</i>
RWDI	RWDI AIR Inc.
Tetra Tech	Tetra Tech EBA Inc.
TP1247	TP1247E (2013/2014) Aviation Land Use in the Vicinity of Aerodromes
TP312	TP312 Aerodrome Standards and Recommended Practices
VFR	visual flight rules
<i>White Burgess</i>	<i>White Burgess Langille Inman v. Abbott and Haliburton Co.</i>
WSP	WSP Canada Inc.

Appendix E – Standing ruling



Appendix E -
Standing ruling.pdf

(consists of 3 pages)

Appendix F – Table of commitments⁵⁷³

No.	Category	Commitments
1.	Noise	a) EDPR will conduct appropriately designed and suitably representative post-construction noise monitoring at select receptors, in accordance with the methodology set out in Rule 012.
2.	Safety and Emergency Response	a) EDPR will work with the local emergency responders and the Special Areas Board ("SAB") to ensure there is a site-specific emergency response plan in place prior to commencing construction.
3.	Airstrips	a) EDPR will ensure wind turbine generators ("WTGs") are not located within the non-instrument runway Obstacle Limitation Surface for visual flight rules as defined in Transport Canada, Aerodrome Standards and Recommended Practices, TP312 5th Edition, to the active non-certified aerodromes within the Project boundary.
4.	Collection System	<p>a) EDPR will mark all collection lines at property lines and road, pipeline or water crossings and register the collection lines with the Alberta One Call.</p> <p>b) EDPR will use a combination of narrow trench ($\geq 2:300\text{m}$ impact) and horizontal drilling ($< 300\text{m}$ impact) methods for installation of the collection system within areas of native prairie, unless unexpected engineering constraints are encountered.</p> <p>c) EDPR will co-locate the collection line and access road for WTG 9 in order to reduce impacts on native prairie.</p> <p>d) EDPR will utilize horizontal directional boring for the purpose of installing the collection system at intersections with wetlands, roads and pipeline infrastructure, where required.</p> <p>e) Any overhead collection lines will use a monopole design.</p> <p>f) EPDR will design any overhead collection lines in accordance with the recommended practices of the Avian Power Line Interaction Committee.</p>
5.	Construction	<p>a) EDPR will prepare training materials including informational posters and slides which identify sensitive species that may be encountered with in the Project area. This information will be used to assist in training construction personnel that will be working on the project. Considerations for mitigation and avoidance will be included in the site-specific employee and contractor orientation. Training will be conducted for each worker, and a training log will be retained by EDPR.</p> <p>b) EDPR will (i) conduct construction activity between the hours of 7 a.m. and 10 p.m., except in unusual circumstances; (ii) advise nearby residents of significant noise-causing activities and schedule these events to reduce disruption as much as possible; and (iii) ensure that all internal combustion engines are well maintained with muffler systems.</p>

⁵⁷³ Exhibit 22665-X0289, Outstanding Undertakings, pages 4-6.

No.	Category	Commitments
6.	Reclamation/ Decommissioning/ Restoration	<ul style="list-style-type: none"> a) EDPR will comply with the statutory reclamation requirements in place at the time of decommissioning. b) EDPR will prepare a Reclamation and Restoration Plan with specific success criteria for native grassland to be approved by AEP prior to commencing construction.
7.	Repowering	<ul style="list-style-type: none"> a) In the event of re-powering of the Project, the infrastructure may be reused. In the event that they are not reused, they will be reclaimed based on the statutory reclamation requirements in place at the time of repowering.
8.	Roads, Road Use Agreements, and Crossing Agreements	<ul style="list-style-type: none"> a) EDPR will enter into a Road Use Agreement, or similar agreement, with the SAB that will cover matters such as transportation plans for construction, construction impacts to roads, and compensation, road upgrades, and road use for Project infrastructure. b) EDPR will complete pre-construction road surveys. EDPR may upgrade some public roads. EDPR will complete post-construction road surveys and commits to ensuring that road condition is maintained or improved in accordance with the Road Use Agreement. c) EDPR will enter into crossing agreements with third-party facility (e.g. pipelines) owners, and road use agreements as required to support Project construction.
9.	<i>Water Act Application</i>	<ul style="list-style-type: none"> a) EDPR will complete <i>Water Act</i> applications as required. b) EDPR will maintain all drainage pathways in accordance with the <i>Alberta Water Act Code of Practice for Watercourse Crossings</i>.
10.	Consultation	<ul style="list-style-type: none"> a) During the Project's development and throughout the construction phase, EDPR will continue its Participant Involvement Program in accordance with Rule 007, including with respect to new stakeholders who buy, lease, rent, or occupy properties within 2km project boundary. b) EDPR will consult with the SAB and the community on transportation routes to be used for construction and component delivery, and will work with the SAB to notify the community regarding selected routes and times of use. EDPR will seek to avoid delivery times after 7:00 PM and will take school bus routes into consideration in the transportation and logistics plan. c) EDPR will ensure that Project-related waste will be disposed of in accordance with all legal requirements. EDPR will be responsible for cleanup of construction waste within road right of ways and on private property.
11.	Aerial Spraying	<ul style="list-style-type: none"> a) EDPR will commit to consult with aerial spraying companies/individuals to discuss proposed locations and timing of spraying activities and associated safety considerations at the time such activities are proposed.

No.	Category	Commitments
12.	Environment	<p>a) EDPR will implement the environmental protection measures as identified in the 2017 AEP Wildlife Referral Report, Environmental Evaluation Reports and associated appendices, including the Construction and Operations Plan and the Post Construction Monitoring and Adaptive Management Plan</p> <p>b) The WTG model for the Project will have an engineering design that is capable of measuring wind speed and air temperature near the WTG.</p> <p>c) EDPR will seek to reduce the spatial impacts to native grassland associated with WTG 9 and associated infrastructure. Where complete avoidance of long-term impacts cannot be achieved at WTG 9 and associated infrastructure, EDPR will work with AEP to offset impacts by conserving native grassland elsewhere.</p>
13.	Operations	<p>a) A Spill Prevention, Control and Countermeasure Plan will be developed for the Project and implemented as required for the purposes of operation and maintenance.</p>

Appendix G – The predicted nighttime cumulative noise levels based on the RWDI updated model from Exhibit 22665-X0273

Noise Receptor	Nighttime ASL	Third-party Noise Contribution	Project Noise Contribution	Cumulative Sound Level ^a	Cumulative Sound Level (with Rounding)	PSL	Compliance Margin ^b
R1	35	13.1	33.5	37.3	37	40	2.7
R2	35	14.2	32.5	37.0	37	40	3.0
R3	35	14.1	32.6	37.0	37	40	3.0
R4	35	13.4	34.4	37.7	38	40	2.3
R5	35	13.4	34.4	37.7	38	40	2.3
R6	35	13.1	33.5	37.3	37	40	2.7
R7	35	13.0	33.4	37.3	37	40	2.7
R8	35	10.7	36.3	38.7	39	40	1.3
R9	35	11.3	34.4	37.7	38	40	2.3
R10	35	11.3	34.5	37.8	38	40	2.2
R11	35	9.3	37.0	39.1	39	40	0.9
R12	35	8.6	32.0	36.8	37	40	3.2
R13	35	8.6	32.3	36.9	37	40	3.1
R14	35	8.8	37.3	39.3	39	40	0.7
R15	35	12.0	33.6	37.4	37	40	2.6
R16	35	8.5	37.8	39.6	40	40	0.4
R17	35	8.5	37.7	39.6	40	40	0.4
R18	35	6.2	36.7	38.9	39	40	1.1
R19	35	20.3	37.4	39.4	39	40	0.6
R20	35	19.2	35.6	38.4	38	40	1.6
R21	35	16.4	34.7	37.9	38	40	2.1
R22	35	17.5	35.4	38.3	38	40	1.7
R23	35	17.5	35.6	38.4	38	40	1.6
R24	35	21.5	33.6	37.5	37	40	2.5
R25	35	28.7	36.6	39.3	39	40	0.7
R26	35	11.3	30.1	36.2	36	40	3.8
R27	35	11.2	30.1	36.2	36	40	3.8
R28	35	12.8	37.8	39.6	40	40	0.4
R29	35	12.8	37.6	39.5	40	40	0.5
R30	35	12.9	36.6	38.9	39	40	1.1
R31	35	13.0	36.2	38.7	39	40	1.3
R32	35	22.9	37.2	39.3	39	40	0.7
R33	35	23.5	35.7	38.5	39	40	1.5
R34	35	20.2	36.3	38.8	39	40	1.2
R35	35	37.4	28.4	39.7	40	40	0.3
R36	35	6.9	32.3	36.9	37	40	3.1

Notes: a. Cumulative sound level is the sum of the nighttime ASL, the third-party noise contribution, and the project noise contribution.

b. Compliance margin is PSL minus cumulative sound level.

February 22, 2018

To: Parties currently registered on Proceeding 22665

**EDP Renewables SH Project GP Ltd.
Sharp Hills Wind Farm
Proceeding 22665
Applications 22665-A001 to 22665-A004**

Ruling on standing

1. In this ruling, the Alberta Utilities Commission decides whether to hold a public hearing to consider applications by EDP Renewables SH Project GP Ltd. (EDPR) for approval to construct and operate a 298.8-megawatt wind power project, called the Sharp Hills Wind Farm (the project), near Sedalia, Alberta.
2. The Commission must hold a hearing if persons who have filed a statement of intent to participate in Proceeding 22665 have demonstrated that they have rights that may be “directly and adversely affected” by the Commission’s decision. Such a person may participate fully in the hearing, including giving evidence, questioning of witnesses, and providing argument. This permission to participate is referred to as standing.
3. EDPR initially submitted a Phase 1 buildable area application in relation to the project (an application for approval of the areas in which EDPR proposes to construct the project), for which the Commission issued a notice of application on June 13, 2017. The Commission received statements of intent to participate (SIPs) from a number of persons in response to the initial notice of application.
4. EDPR subsequently filed a Phase 2 buildable area application and the Commission consolidated EDPR’s Phase 1 and Phase 2 applications into a single, combined application under Proceeding 22665. The Commission issued a new notice of application for the combined proceeding on September 25, 2017, and received one SIP from the Clearview Group in response. The Clearview Group filed an updated membership list on January 10, 2018.
5. The Commission has authorized me to communicate its decision on standing.

Ruling

6. As set out in its letters filed on September 25, 2017, and January 10, 2018, the Clearview Group includes all of the persons who had filed SIPs in response to the initial notice of application for Phase 1, except for Steelhead Petroleum Ltd., which subsequently withdrew from the proceeding.¹

¹ Exhibit 22665-X0046, Steelhead Petroleum filing withdrawal email 2017-08-01.

7. The members of the Clearview Group described the potential effects of the project on their rights in their SIP. The effects described by group members include visual impacts, decreased property values, environmental impacts, noise, and aviation impacts. Given the scope and nature of the proposed project, and taking into account the wind turbines proposed by EDPR, the Commission finds that persons that own or reside upon land located within two kilometres of one or more of the proposed turbines have rights that may be directly and adversely affected by the Commission's decision on the project and therefore have standing to participate in the proceeding.

8. The Commission is satisfied that the members of the Clearview Group listed in Appendix A all own and or reside on land within two kilometres of the proposed project and have demonstrated that the Commission's decision on the application may directly and adversely affect their rights.

9. In its January 10, 2018 update letter, the Clearview Group advised that while the majority of its members own land and/or reside within two kilometres of the project, the property interests of some members fall outside of the two-kilometre radius. The Clearview Group asserted however, that given the unprecedented height of the proposed turbines, its members outside of the two-kilometre radius will also be directly and adversely affected by the Commission's decision on the project. Those members that appear to fall outside of the two-kilometre radius are listed in Appendix B.

10. The Commission finds that there is insufficient information to determine the standing of those members of the Clearview Group that own and or reside on lands more than two kilometres from the project. However, consistent with the Commission's past practice, those members may participate in the proceeding as members of the Clearwater Group but may be ineligible to claim honoraria and the personal disbursements associated with their participation.

11. Please contact me at 403-592-4385 or at kim.macnab@auc.ab.ca if you have any questions about the matters addressed in this letter.

Regards,

Kim Macnab
Commission Counsel

Attachment

Appendix A – Members of the Clearview Group with standing in Proceeding 22665

Name
Don and Coleen Blair
Cory and Nicole Blair
Robert Carter and Diane McCallum
Matt Ference, Nicole Seitz and Deanna R. Seitz
Kristine Fossum and Eddie Stewart
Danielle Grover
Bruce Hayworth
Randy Hayworth
Nelson Hertz
Chris, Lindsay and Leonard Jorgenson
Joan, Jordan and Neil Jorgenson
Glenn and Lorelee Kroker
Sheldon and Kelly Kroker
Jim Ness
Jonathan Ness
Larry Ness
Gene and Viola Olsen
George Paillard
Hugh Ross
Darren and Kathy Simpson
Barry and Juanita Wagstaff
Quinn and Jamie Wagstaff
Lloyd Wagstaff

Appendix B – Members of the Clearview Group that appear to fall outside the two-kilometre power plant radius

Name
Kent and Dawne Beaudoin
Farley Gould
Charles and Nora Gould
Matt Gould
Sheldon Hertz
Larry Kaumeyer
Victor and Marilyn Kroker
Patrick Paillard
Taylor Paillard and George Paillard
Aaron and Nadine Rude
Sandra and Steven Rude
Raymond and Sherrie Rude
Jim and Patricia Wiechnik
Denis Wiechnik