OTTER CREEK WIND FARM

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Otter Creek Wind Farm Limited Partnership

Project Modifications Report

Prepared by:

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Date: February, 2018
Project #: 60504082

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AECOM: 2015-04-13

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1. Introduction

The Otter Creek Wind Farm (the Project) is being proposed by Otter Creek Wind Farm Limited Partnership (Otter Creek), a partnership of Renewable Energy Systems Canada (RES Canada), Boralex Inc. and Walpole Island First Nation. The Project is also grateful to have received support from the Municipality of Chatham-Kent which has been granted an option to participate in the Project after commercial operation commences.

An application for Renewable Energy Approval (REA), along with supporting REA reports, was submitted to the Ministry of the Environment and Climate Change (MOECC) for review in March, 2017.

1.1 Project Location

The Project is proposed to be located north of the community of Wallaceburg in the Municipality of Chatham-Kent, Ontario. The Project Location is generally bounded by Whitebread Line and Kent Line to the north, Payne Road to the west, Stewart Line and McCreary Line to the south and Mandaumin Road / County Road 44 to the east. Project Location is shown in **Figure 1-1** provided in **Appendix A**. Note, there are no proposed changes to the Project Location.

1.2 Contact Information

Applicant:

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1.3 Proposed Project Modifications

1.3.1 Description of Proposed Modifications

Otter Creek has identified the need to incorporate limited operational flexibility with the turbine model characteristics proposed in the original REA site plan. The nameplate capacity for the Project remains unchanged at up to 50 megawatts (MW). The total number of turbines also remains unchanged at up to 12 wind turbines. Otter Creek is proposing to use the following turbine models as reference turbines:

- **Ten (10) – Enercon E-141 EP4 4.2 MW (or an acoustically equivalent turbine)**

  Hub Height: 129 m - 132 m
  Rotor Diameter: 136 m - 141 m

- **Two (2) – Vestas V136 SO3 3.12 MW (or an acoustically equivalent turbine)**

  Hub Height: 129 m - 132 m
  Rotor Diameter: 136 m - 141 m

The Enercon E-141 EP4 4.2 MW (or an acoustically equivalent turbine), as proposed in the revised Noise Impact Assessment (**Appendix B**), will serve as a reference turbine moving forward for T1, T2, T4, and T6 – T12. The modified Vestas V136 SO3 3.12 MW (or an acoustically equivalent turbine), as proposed in the revised Noise Impact Assessment (**Appendix B**), will serve as a reference turbine moving forward for T3 and T5. The sound characteristics of the Enercon E-141 EP4 4.2 MW and the Vestas V136 SO3 3.12 MW outlined within the revised Noise Impact Assessment are the maximum thresholds for sound. Note: since the Enercon E-141 EP4 4.2 MW and Vestas V136 SO3 turbines are being presented as reference turbines, alternative acoustically equivalent turbine models could be used for any location with no restriction on the turbine power generation capacity. This will be subject to the total nameplate capacity for the Project of 50 MW and the total number of turbines of up to 12 wind turbines. The Proposed Enercon and Vestas reference turbines (or acoustically equivalent wind turbines) are commercially and technically feasible and meet the MOECC noise requirements.

Additionally, through discussions with MOECC on the Water Bodies Assessment/Report, a total of 12 waterbodies that were originally characterized as non-REA waterbodies, required reclassification to REA waterbodies. This change required Otter Creek to shift the location of T12 by less than 10 metres away from WB-018 Browning Drain (REA waterbody). No other project changes were required as a result of the waterbodies reclassification. The Water Body Assessment and Water Body Report have been updated to reflect waterbodies reclassification and the change associated with T12. The updated coordinates of the wind turbine 12 are provided in **Table 1-1**.

Table 1-1: Coordinates of Turbine 12

Turbine	X	Y
T12	395268.00	4719448.50

The total project nameplate capacity remains unchanged at up to 50 MW and no new or increased environmental effects occur as a result of the changes outlined above. The updated overall Project Location figure (**Figure 1-1**) showing the locations of wind turbines, as well as a figure illustrating the revised T12 location (**Figure 1-2**) are provided in **Appendix A**.

1.3.2 Effects of Proposed Modifications

The changes to the REA application previously submitted to MOECC are minor in nature because:

- The updated T12 location occurs on land that was previously assessed during the REA process and the amount, type and location of land potentially impacted as a result of the Project remain unchanged from what was presented to public and consulted on during the REA process;
- Sound levels decreased by 0.1 dB at a minimum of 10 receptor locations while sound levels increased by no more than 0.1 dB at a maximum of 6 receptors due to the minor T12 shift. These increases are nominal and primarily occur on non-participating vacant lot receptors. More information about receptors is provided in the revised Noise Impact Assessment (**Appendix B**).
- There are no changes to the Project Location that was proposed in the original REA application and as a result:
    - There are no changes required to the effects assessment provided in the Project Description Report, Construction Plan Report, Design and Operations Report or Decommissioning Plan Report;
    - No additional land requires archaeological assessment and no changes are required to the results and/or conclusions of Stage 1 and Stage 2 Archaeological Assessments provided in the original REA application;
    - No additional fieldwork is required and there are no changes required to the results and/or conclusions included the Heritage Impact Assessment Report; and
    - No additional fieldwork is required and the only change required to the Site Investigations or Evaluation of Significance Reports are references to the turbine models. Updates to the effects assessment and monitoring plans outlined in the Environmental Impact Study and Environmental Effects Monitoring Plan are not required;
    - No additional fieldwork is required and no updates are needed to the effects assessment in the Water Body Report;
- Turbine locations remain compliant with setback requirements in O. Reg. 359/09 and turbines continue to be located at least 30 metres from water bodies and 120 metres from other natural features; and
- There is no discernable increase in the overall predicted sound level impact at the receptors and all non-participating receptors remain compliant or below the applicable MOECC sound level limits.

1.4 Edits to the REA Reports

The purpose of this report is to document the necessary revisions to the following REA reports resulting from the proposed modifications:

- Project Description Report;
- Construction Plan Report;
- Design and Operations Report;
- Property Line Setback Assessment;
- Decommissioning Plan Report;
- Wind Turbine Specifications Report;
- Heritage Impact Assessment Report; and
- Natural Heritage Assessment Reports.

Revisions to Noise Impact Assessment, Water Body Assessment and Water Body Report were made under separate covers. Please refer to **Appendix B** for the revised Noise Impact Assessment and **Appendix C** for the updated Water Body Assessment and Water Body Report.

The Natural Heritage Assessment Records Review Report and Archaeological Assessment Reports did not require any edits resulting from project modifications.

Edits to the REA Reports resulting from the modifications described in Section 1.1 are listed in **Table 1-2**. The table includes the text from the original REA submission and edits to the text.

Table 1-2: Edits to the REA Reports

Section / Page in REA Report	REA Report Text	Revised Text (~~Strikethrough text~~ represents deletions, <u>underlined text</u> represents additions and text in *italics* represents comments.)
Project Description Report		
Section 1.4 / Page 4	The Project will use wind to generate energy through the use of wind turbine technology. The proposed wind turbine for this project is the Enercon E-141. The Project's nameplate capacity is up to 50 megawatts (MW) and the wind farm will consist of 12 turbines. The Project is categorized as a Class 4 wind facility and will be in compliance with the requirements outlined for such facilities.	The Project will use wind to generate energy through the use of wind turbine technology. The proposed wind turbine for this project is the Enercon E-141 <u>EP4 (or an acoustically equivalent turbine) and Vestas V136 SO3 (or an acoustically equivalent turbine)</u>. The Project's nameplate capacity is up to 50 megawatts (MW) and the wind farm will consist of 12 turbines. The Project is categorized as a Class 4 wind facility and will be in compliance with the requirements outlined for such facilities.
Table 1.3 / Page 4	Make and Model: Enercon E-141 Hub Height: 129 m Rotor Diameter: 141 m	Make and Model: <u>Ten (10) –</u> Enercon E-141 <u>EP4 (or an acoustically equivalent turbine)</u> Hub Height: 129 m <u>- 132 m</u> Rotor Diameter: <u>136 m -</u> 141 m <u>Two (2) – Vestas V136 SO3 (or an acoustically equivalent turbine)</u> <u>Nominal Turbine Power: 3.12 MW</u> <u>Hub Height: 129 m - 132 m</u> <u>Rotor Diameter: 136 m - 141 m</u> <u>Cut-in Wind Speed: 3.0 m/s</u> <u>Cut-out Wind Speed: 27.5 m/s</u> <u>Swept Area: 14,527 m^2</u>
Section 1.5 / Page 5	**The Proponent** Applicant: The contacts for the Project are as follows: Asier Ania Project Manager, Development Boralex Inc. 201-174 Mill Street, Milton, ON L9T 1S2 Phone: 1-844-363-6430 ext.6432 Email: asier.ania@boralex.com	Applicant: The contacts for the Project are as follows: ~~Asier Ania~~ ~~Project Manager, Development~~ ~~Boralex Inc.~~ ~~201-174 Mill Street, Milton, ON L9T 1S2~~ ~~Phone: 1-844-363-6430 ext.6432~~ ~~Email: asier.ania@boralex.com~~ <u>Bryan Tripp</u> <u>Project Manager</u> <u>Boralex Inc.</u> <u>174 Mill Street, Suite 201</u> <u>Milton, ON L9T 1S2</u> <u>Phone: (844) 363-6430 ext. 6435</u> <u>Email: bryan.tripp@boralex.com</u>
Section 4.3.1.1 / Page 22	In accordance with the O. Reg. 359/09, background review and site investigations were conducted to identify and characterize all aquatic features within 120 m of the Project Location. These investigations determined each water body's REA water body status as per Section 1.1 of the O. Reg. 359/09. The results of this assessment are provided in the Water Body Assessment Report (AECOM, 2017c). A total of 34 watercourses and drainage features and two ponds were assessed and 16 of these water bodies were confirmed as REA water bodies. The results of the impact assessment of the project on the identified REA water bodies can be found in the Water Body Report (AECOM, 2016f).	In accordance with the O. Reg. 359/09, background review and site investigations were conducted to identify and characterize all aquatic features within 120 m of the Project Location. These investigations determined each water body's REA water body status as per Section 1.1 of the O. Reg. 359/09. The results of this assessment are provided in the Water Body Assessment Report (AECOM, ~~2017c~~ <u>2018</u>). A total of ~~34~~ <u>36 potential</u> water~~courses~~ <u>bodies</u> ~~and drainage features and two ponds~~ were assessed and ~~16~~ <u>28</u> of these ~~water bodies~~ features were confirmed as REA water bodies. The results of the impact assessment of the project on the identified REA water bodies can be found in the Water Body Report (AECOM, ~~2016f~~ <u>2018a</u>).
Construction Plan Report		
Section 1.3 / Page 2	**The Proponent** Applicant: The contacts for the Project are as follows: Asier Ania	**The Proponent** Applicant: The contacts for the Project are as follows: ~~Asier Ania~~

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Table 1.5 / Page 3	Make and Model: Enercon E-141 Hub Height: 129 m Rotor Diameter: 141 m	Make and Model: <u>Ten (10) – Enercon E-141 EP4 (or an acoustically equivalent turbine)</u> Hub Height: 129 m<u> - 132 m</u> Rotor Diameter: <u>136 m -</u> 141 m <u>Two (2) – Vestas V136 SO3 (or an acoustically equivalent turbine)</u> <u>Nominal Turbine Power: 3.12 MW</u> <u>Hub Height: 129 m - 132 m</u> <u>Rotor Diameter: 136 m - 141 m</u> <u>Cut-in Wind Speed: 3.0 m/s</u> <u>Cut-out Wind Speed: 27.5 m/s</u> <u>Swept Area: 14,527 m^2</u>
Section 4.3.1 / Page 30	**Surface Water and Runoff and Impacts to Water Bodies** According to Section 1.1 of the O. Reg. 359/09, as amended, a water body is defined as: a: *"A lake, permanent stream, intermittent stream and a seepage area but does not include:* *a) grassed waterways;* *b) temporary channels for surface drainage, such as furrows or shallow channels that can be tilled and driven through;* *c) rock chutes and spillways;* *d) roadside ditches that do not contain a permanent or intermittent stream;* *e) temporary ponded areas that are normally farmed;* *f) dugout ponds; and* *g) artificial bodies of water intended for storage, treatment or recirculation of runoff from animal yards, manure storage facilities and sites and outdoor confinement areas."* In accordance with the O. Reg. 359/09 background review and site investigations were conducted to identify and characterize all aquatic features within 120 m of the Project Location. These investigations determined each water body's REA water body status as per Section 1.1 of the O. Reg. 359/09. The results of this assessment are provided in the Water Body Assessment Report (AECOM, 2017c). A total of 34 watercourses and drainage features and two ponds were assessed and 16 of these water bodies were confirmed as REA water bodies. The results of the impact assessment of the project on the identified REA water bodies can be found in the Water Body Report (AECOM, 2017d).	**Surface Water and Runoff and Impacts to Water Bodies** According to Section 1.1 of the O. Reg. 359/09, as amended, a water body is defined as: a: *"A lake, permanent stream, intermittent stream and a seepage area but does not include:* *h) grassed waterways;* *i) temporary channels for surface drainage, such as furrows or shallow channels that can be tilled and driven through;* *j) rock chutes and spillways;* *k) roadside ditches that do not contain a permanent or intermittent stream;* *l) temporary ponded areas that are normally farmed;* *m) dugout ponds; and* *n) artificial bodies of water intended for storage, treatment or recirculation of runoff from animal yards, manure storage facilities and sites and outdoor confinement areas."* In accordance with the O. Reg. 359/09 background review and site investigations were conducted to identify and characterize all aquatic features within 120 m of the Project Location. These investigations determined each water body's REA water body status as per Section 1.1 of the O. Reg. 359/09. The results of this assessment are provided in the Water Body Assessment Report (AECOM, ~~2017c~~ <u>2018</u>). A total of ~~34~~ <u>36 potential</u> water~~courses~~ <u>bodies</u> ~~and drainage features and two ponds~~ were assessed and ~~16~~ <u>28</u> of these ~~water bodies~~ features were confirmed as REA water bodies. The results of the impact assessment of the project on the identified REA water bodies can be found in the Water Body Report (AECOM, ~~2017d~~ <u>2018a</u>).
Design and Operations Report		
Section 1.2 / Page 2	**The Proponent** Applicant: The contacts for the Project are as follows:	**The Proponent** Applicant: The contacts for the Project are as follows:

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Table 1.3 / Page 3	Make and Model: Enercon E-141 Hub Height: 129 m Rotor Diameter: 141 m	Make and Model: <u>Ten (10) –</u> Enercon E-141 <u>EP4 (or an acoustically equivalent turbine)</u> Hub Height: 129 m <u>- 132 m</u> Rotor Diameter: <u>136 m -</u> 141 m <u>Two (2) – Vestas V136 SO3 (or an acoustically equivalent turbine)</u> <u>Nominal Turbine Power: 3.12 MW</u> <u>Hub Height: 129 m - 132 m</u> <u>Rotor Diameter: 136 m - 141 m</u> <u>Cut-in Wind Speed: 3.0 m/s</u> <u>Cut-out Wind Speed: 27.5 m/s</u> <u>Swept Area: 14,527 m^2</u>
Section 3.1 / Page 16	**Wind Turbine Technical Specifications** The Project will use wind to generate energy through the use of commercial wind turbine technology. The proposed wind turbine technology for this Project is the Enercon E-141 turbine. With a total nameplate capacity of up to 50 MW, the Project is categorized as a Class 4 wind facility and will be in compliance with the requirements outlined for such facilities in O. Reg. 359/09, as amended. A total of 12 turbine locations are currently being proposed for the Project.	**Wind Turbine Technical Specifications** The Project will use wind to generate energy through the use of commercial wind turbine technology. The proposed wind turbine technology for this Project is the Enercon E-141 EP4 <u>(or an acoustically equivalent turbine) and Vestas V136 SO3 (or an acoustically equivalent turbine)</u>. With a total nameplate capacity of up to 50 MW, the Project is categorized as a Class 4 wind facility and will be in compliance with the requirements outlined for such facilities in O. Reg. 359/09, as amended. A total of 12 turbine locations are currently being proposed for the Project.
Table 3-1 / Page 16	Make and Model: Enercon E-141 Hub Height: 129 m Rotor Diameter: 141 m	Make and Model: <u>Ten (10) –</u> Enercon E-141 EP4 <u>(or an acoustically equivalent turbine)</u> Hub Height: 129 m <u>- 132 m</u> Rotor Diameter: <u>136 m -</u> 141 m <u>Two (2) – Vestas V136 SO3 (or an acoustically equivalent turbine)</u> <u>Nominal Turbine Power: 3.12 MW</u> <u>Hub Height: 129 m - 132 m</u> <u>Rotor Diameter: 136 m - 141 m</u> <u>Cut-in Wind Speed: 3.0 m/s</u> <u>Cut-out Wind Speed: 27.5 m/s</u> <u>Swept Area: 14,527 m^2</u>
Figure 3-1 / Page 17	*Basic Wind Turbine Specifications*	*Basic Wind Turbine Specifications for Enercon E-141 EP4 (or an acoustically equivalent turbine) and Vestas V136 SO3 (or an acoustically equivalent turbine) are illustrated on updated Basic Wind Turbine Specifications figures (**Figure 1-3a and Figure 1-3b**). Please refer to **Appendix A**.*

Table 1-2: Edits to the REA Reports

Section / Page in REA Report	REA Report Text	Revised Text (~~Strikethrough text~~ represents deletions, underlined text represents additions and text in *italics* represents comments.)
Section 5.3.1 / Page 30	According to Section 1.1 of the O. Reg. 359/09, as amended, a water body is defined as: *"A lake, permanent stream, intermittent stream and a seepage area but does not include:* *a) grassed waterways;* *b) temporary channels for surface drainage, such as furrows or shallow channels that can be tilled and driven through;* *c) rock chutes and spillways;* *d) roadside ditches that do not contain a permanent or intermittent stream;* *e) temporary ponded areas that are normally farmed;* *f) dugout ponds; and* *g) artificial bodies of water intended for storage, treatment or recirculation of runoff from animal yards, manure storage facilities and sites and outdoor confinement areas."* In accordance with the O. Reg. 359/09, background review and site investigations were conducted to identify and characterize all aquatic features within 120 m of the Project Location. These investigations determined each water body's REA water body status as per Section 1.1 of the O. Reg. 359/09. A total of 34 watercourses and drainage features and two ponds were assessed and 16 of these water bodies were confirmed as REA water bodies. The results of the impact assessment of the project on the identified REA water bodies can be found in the Water Body Report (AECOM, 2017b).	According to Section 1.1 of the O. Reg. 359/09, as amended, a water body is defined as: *"A lake, permanent stream, intermittent stream and a seepage area but does not include:* *h) grassed waterways;* *i) temporary channels for surface drainage, such as furrows or shallow channels that can be tilled and driven through;* *j) rock chutes and spillways;* *k) roadside ditches that do not contain a permanent or intermittent stream;* *l) temporary ponded areas that are normally farmed;* *m) dugout ponds; and* *n) artificial bodies of water intended for storage, treatment or recirculation of runoff from animal yards, manure storage facilities and sites and outdoor confinement areas."* In accordance with the O. Reg. 359/09, background review and site investigations were conducted to identify and characterize all aquatic features within 120 m of the Project Location. These investigations determined each water body's REA water body status as per Section 1.1 of the O. Reg. 359/09. A total of ~~34~~ 36 potential water~~courses~~ bodies ~~and drainage features and two ponds~~ were assessed and ~~16~~ 28 of these ~~water bodies~~ features were confirmed as REA water bodies. The results of the impact assessment of the project on the identified REA water bodies can be found in the Water Body Report (AECOM, ~~2017b~~ 2018a).
Appendix D: Property Line Setback Assessment		
Section 1 / Page 1	The Project will use wind to generate energy through the use of wind turbine technology. The proposed wind turbine technology for this Project is Enercon E-141 turbine (see example in Figure 1-2). The Project's nameplate capacity is up to 50 megawatts (MW) and it will consist of 12 wind turbines consisting of Enercon E-141 4.2 MW and Enercon E-141 4.0 MW turbines. The Project is categorized as a Class 4 wind facility and will be in compliance with the requirements outlined for such facilities.	The Project will use wind to generate energy through the use of wind turbine technology. The proposed wind turbine technology for this Project is Enercon E-141 EP4 turbine (or an acoustically equivalent turbine) and Vestas V136 SO3 (or an acoustically equivalent turbine) (see example Figures ~~1-2~~ 1-3a and 1-3b). The Project's nameplate capacity is up to 50 megawatts (MW) and it will consist of ~~12 wind turbines consisting of~~ 10 Enercon E-141 EP4 (or acoustically equivalent turbines) ~~4.2 MW~~ and two ~~Enercon E-141 4.0 MW turbines~~ Vestas V136 SO3 (or acoustically equivalent turbines). The Project is categorized as a Class 4 wind facility and will be in compliance with the requirements outlined for such facilities.
Table 1-1 / Page 1	Make and Model: Enercon E-141 Rotor Diameter: 141 m	Make and Model: Ten (10) – Enercon E-141 EP4 (or an acoustically equivalent turbine) Hub Height: 129 m - 132 m Rotor Diameter: 136 m - 141 m Two (2) – Vestas V136 SO3 (or an acoustically equivalent turbine) Nominal Turbine Power: 3.12 MW Hub Height: 129 m - 132 m Rotor Diameter: 136 m - 141 m Cut-in Wind Speed: 3.0 m/s Cut-out Wind Speed: 27.5 m/s Swept Area: 14,527 m^2
Section 1.3 / Page 2	The Property Line Setback Assessment was prepared to address the requirements of Section 53 of O. Reg. 359/09. Section 53 requires a written assessment to identify any impacts to business, infrastructure, properties or land use activities resulting from a wind turbine location being proposed at a distance equal to or less than the hub height of the wind turbine from an adjacent property line. The hub height used for this assessment is the height from the wind turbine base to the top of the nacelle (134 metres (m)), not the mid-point of the hub (129 m).	The Property Line Setback Assessment was prepared to address the requirements of Section 53 of O. Reg. 359/09. Section 53 requires a written assessment to identify any impacts to business, infrastructure, properties or land use activities resulting from a wind turbine location being proposed at a distance equal to or less than the hub height of the wind turbine from an adjacent property line. The hub height used for this assessment is the height from the wind turbine base to the top of the nacelle (134 metres (m)), not the mid-point of the taller range of hub heights being considered (129 m - 132 m).
Figure 1-2 / Page 3	*Basic Wind Turbine Specifications*	*Basic Wind Turbine Specifications for Enercon E-141 EP4 (or an acoustically equivalent turbine) and Vestas V136 SO3 (or an acoustically equivalent turbine) are illustrated on updated Basic Wind Turbine Specifications figures (**Figure 1-3a and Figure 1-3b**). Please refer to **Appendix A**.*
Section 2.1 / Page 5	The wind turbines assessed in this report are located between approximately 82 m and 131 m from property	The wind turbines assessed in this report are located between approximately 82 m and 131 m from property

Table 1-2: Edits to the REA Reports

Section / Page in REA Report	REA Report Text	Revised Text (~~Strikethrough text~~ represents deletions, <u>underlined text</u> represents additions and text in *italics* represents comments.)
	lines as depicted in Appendix A (Wind Turbine Details and Photo Table) and Appendix B (Wind Turbine Maps). The adjacent lands for all of the assessed wind turbines are entirely used for agricultural purposes, the majority of which is field crops. The Municipality of Chatham-Kent designates the adjacent properties as Agricultural in the Official Plan (2016a) and zones the properties as A1 (Agricultural zones), in the Comprehensive Zoning By-law (2016b). Land uses on the adjacent properties to the assessed wind turbines are restricted to agricultural uses and agriculturally-related uses.	lines as depicted in Appendix A (Wind Turbine Details and Photo Table) and Appendix B (Wind Turbine Maps) (*Refer to **Appendix A** for Property Line Setback Assessment figure (**Figure 1-4**) showing proposed location of T12*). The adjacent lands for all of the assessed wind turbines are entirely used for agricultural purposes, the majority of which is field crops. The Municipality of Chatham-Kent designates the adjacent properties as Agricultural in the Official Plan (2016a) and zones the properties as A1 (Agricultural zones), in the Comprehensive Zoning By-law (2016b). Land uses on the adjacent properties to the assessed wind turbines are restricted to agricultural uses and agriculturally-related uses.
Appendix A: Wind Turbine Details and Photos Table	Turbine ID: 12 UTM Co-ordinates (X): 395268 UTM Co-ordinates (Y): 4719458 Host Land Parcel #: 005950024 Host Land Parcel Street: Langstaff Line / Brigden Road Turbine Distance from Neighbouring Property Line (m): 88 Direction of Neighbouring Land Parcel from Turbine: North Neighbouring Land Parcel #: 005950023 (non-participating) Neighbouring Land Parcel Street: Kent Line Turbine Distance from Neighbouring Property Line (m): 115 Direction of Neighbouring Land Parcel from Turbine: East Neighbouring Land Parcel #: 005950026 (participating) Neighbouring Land Parcel Street: Langstaff Line	Turbine ID: 12 UTM Co-ordinates (X): 395268 UTM Co-ordinates (Y): ~~4719458~~ <u>4719448.50</u> Host Land Parcel #: 005950024 Host Land Parcel Street: Langstaff Line / Brigden Road Turbine Distance from Neighbouring Property Line (m): ~~88~~ <u>98</u> Direction of Neighbouring Land Parcel from Turbine: North Neighbouring Land Parcel #: 005950023 (non-participating) Neighbouring Land Parcel Street: Kent Line Turbine Distance from Neighbouring Property Line (m): 115 Direction of Neighbouring Land Parcel from Turbine: East Neighbouring Land Parcel #: 005950026 (participating) Neighbouring Land Parcel Street: Langstaff Line
Decommissioning Plan Report		
Section 1.2 / Page 2	**The Proponent** Applicant: The contacts for the Project are as follows: Asier Ania Project Manager, Development Boralex Inc. 201-174 Mill Street, Milton, ON L9T 1S2 Phone: 1-844-363-6430 ext.6432 Email: asier.ania@boralex.com	**The Proponent** Applicant: The contacts for the Project are as follows: ~~Asier Ania~~ ~~Project Manager, Development~~ ~~Boralex Inc.~~ ~~201-174 Mill Street, Milton, ON L9T 1S2~~ ~~Phone: 1-844-363-6430 ext.6432~~ ~~Email: asier.ania@boralex.com~~ <u>Bryan Tripp</u> <u>Project Manager</u> <u>Boralex Inc.</u> <u>174 Mill Street, Suite 201</u> <u>Milton, ON L9T 1S2</u> <u>Phone: (844) 363-6430 ext. 6435</u> <u>Email: bryan.tripp@boralex.com</u>
Table 1-3 / Page 3	Make and Model: Enercon E-141 Hub Height: 129 m Rotor Diameter: 141 m	Make and Model: <u>Ten (10) –</u> Enercon E-141 <u>EP4 (or an acoustically equivalent turbine)</u> Hub Height: 129 m <u>- 132 m</u> Rotor Diameter: <u>136 m -</u> 141 m <u>Two (2) – Vestas V136 SO3 (or an acoustically equivalent turbine)</u> <u>Nominal Turbine Power: 3.12 MW</u> <u>Hub Height: 129 m - 132 m</u> <u>Rotor Diameter: 136 m - 141 m</u> <u>Cut-in Wind Speed: 3.0 m/s</u>

Table 1-2: Edits to the REA Reports

Section / Page in REA Report	REA Report Text	Revised Text (~~Strikethrough text~~ represents deletions, <u>underlined text</u> represents additions and text in *italics* represents comments.)
		<u>Cut-out Wind Speed: 27.5 m/s</u> <u>Swept Area: 14,527 m^2</u>
Wind Turbine Specifications Report		
Section 1.3 / Page 2	**The Proponent** Applicant: The contacts for the Project are as follows: Asier Ania Project Manager, Development Boralex Inc. 201-174 Mill Street, Milton, ON L9T 1S2 Phone: 1-844-363-6430 ext.6432 Email: asier.ania@boralex.com	**The Proponent** Applicant: The contacts for the Project are as follows: ~~Asier Ania~~ ~~Project Manager, Development~~ ~~Boralex Inc.~~ ~~201-174 Mill Street, Milton, ON L9T 1S2~~ ~~Phone: 1-844-363-6430 ext.6432~~ ~~Email: asier.ania@boralex.com~~ <u>Bryan Tripp</u> <u>Project Manager</u> <u>Boralex Inc.</u> <u>174 Mill Street, Suite 201</u> <u>Milton, ON L9T 1S2</u> <u>Phone: (844) 363-6430 ext. 6435</u> <u>Email: bryan.tripp@boralex.com</u>
Section 2.1 / Page 5	The Project will use wind to generate energy through the use of commercial wind turbine technology. The proposed wind turbine technology for this project is the Enercon E-141 turbine. The Project's nameplate capacity is up to 50 megawatts (MW) and it will consist of 12 turbines consisting of Enercon E-141 4.2 MW and Enercon E-141 4.0 MW turbines. The Project is categorized as a Class 4 wind facility and will be in compliance with the requirements outlined for such facilities.	The Project will use wind to generate energy through the use of commercial wind turbine technology. The proposed wind turbine technology for this project is the Enercon E-141 <u>EP4</u> turbine <u>(or an acoustically equivalent turbine) and Vestas V136 SO3 (or an acoustically equivalent turbine)</u>. The Project's nameplate capacity is up to 50 megawatts (MW) and it will consist of ~~12 wind turbines consisting of~~ <u>10</u> Enercon E-141 <u>EP4 (or acoustically equivalent turbines)</u> ~~4.2 MW~~ and <u>two</u> ~~Enercon E-141 4.0 MW turbines~~ <u>Vestas V136 SO3 (or acoustically equivalent turbines)</u>. The Project is categorized as a Class 4 wind facility and will be in compliance with the requirements outlined for such facilities.
Table 2-1 / Page 5	Make and Model: Enercon E-141 Hub Height: 129 m Rotor Diameter: 141 m	Make and Model: <u>Ten (10) – Enercon E-141 EP4 (or an acoustically equivalent turbine)</u> Hub Height: 129 m <u>- 132 m</u> Rotor Diameter: <u>136 m -</u> 141 m <u>Two (2) – Vestas V136 SO3 (or an acoustically equivalent turbine)</u> <u>Nominal Turbine Power: 3.12 MW</u> <u>Hub Height: 129 m - 132 m</u> <u>Rotor Diameter: 136 m - 141 m</u> <u>Cut-in Wind Speed: 3.0 m/s</u> <u>Cut-out Wind Speed: 27.5 m/s</u> <u>Swept Area: 14,527 m^2</u>
Section 2.2.1 / Page 5-6	As shown as an example on Figure 2-1, the Enercon E-141 wind turbine is made up of four main components: the foundation, tower, nacelle (e.g., hub) and blades (Enercon, 2016a). The nacelle will be mounted on a tubular steel and/or concrete tower which may contain an internal personnel hoists and lifts for maintenance access. A prefabricated power module is located at the bottom of the tower and provides the platform for the power converter. The turbine collector transformer will be located within the wind turbines and as the Enercon E-141 is a direct drive machine that does not contain a gearbox. The turbine will be constructed on a foundation that will be up to 30 m in diameter. The foundation consists of poured concrete, steel rebar, and piles, if necessary, to provide added strength.	As shown as an example on Figures ~~2-1~~ <u>1-3a and 1-3b</u>, the Enercon E-141 <u>EP4 and Vestas V136 SO3</u> wind turbine<u>s</u> are made up of four main components: the foundation, tower, nacelle (e.g., hub) and blades ~~(Enercon, 2016a)~~. The nacelle will be mounted on a tubular steel and/or concrete tower which may contain an internal personnel hoists and lifts for maintenance access. A prefabricated power module is located at the bottom of the tower and provides the platform for the power converter. The turbine collector transformer will be located within <u>or beside</u> the wind turbine~~s and as the Enercon E-141 is a direct drive machine that does not contain a gearbox~~. The turbine will be constructed on a foundation that will be up to 30 m in diameter. The foundation consists of poured concrete, steel rebar, and piles, if necessary, to provide added strength.

Table 1-2: Edits to the REA Reports

<table>
<tr><th>Section / Page in REA Report</th><th>REA Report Text</th><th>Revised Text
(~~Strikethrough text~~ represents deletions, underlined text represents additions and text in italics represents comments.)</th></tr>
<tr><td></td><td>The three 66.7 m blades of the Enercon E-141 wind turbine will generate electricity between the wind speeds of 2.5 m/s (i.e., the cut-in wind speed) and 34.0 m/s (i.e., the cut-out wind speed in reduced mode). Most of the equipment used to convert wind energy into electricity is contained in the nacelle of the turbine. The nacelle also acts as a sound enclosure to reduce sound emissions. Another feature that reduces sound emission is the trailing edge serrations which are at the trailing edge of the turbine blades. These trailing edge serrations help break up the air flow around the turbine blades and decrease turbulence, reducing turbulence and in turn reducing the aerodynamic noise generated by the turbines.

The nacelle includes major wind turbine components such as the main shaft, bearing, brake disc and generator but does not include a gearbox, as other turbines often do. The nacelle casing is made of aluminium. It consists of multiple sections that attach to the generator stator, the frame (in the machine house) and the hub (in the rotor area) via extruded profiles (Figure 2 2). The wind turbine is equipped with a lightning protection system to protect from the effects of direct and nearby strikes.</td><td>The three ~~66.7 m~~ blades of the ~~Enercon E-141~~ wind turbines will generate electricity between the wind speeds of 2.5 m/s (i.e., the cut-in wind speed) and 34.0 m/s (i.e., the cut-out wind speed in reduced mode). Most of the equipment used to convert wind energy into electricity is contained in the nacelle of the turbine. The nacelle also acts as a sound enclosure to reduce sound emissions. Another feature that reduces sound emission is the trailing edge serrations which are at the trailing edge of the turbine blades. These trailing edge serrations help break up the air flow around the turbine blades and decrease turbulence, reducing turbulence and in turn reducing the aerodynamic noise generated by the turbines.

The nacelle includes major wind turbine components such as the main shaft, bearing, brake disc, ~~and~~ generator and may include a gearbox. ~~but does not include a gearbox, as other turbines often do.~~ The nacelle casing is made of aluminium. It consists of multiple sections that attach to the generator stator, the frame (in the machine house) and the hub (in the rotor area) via extruded profiles (Figure 2 2). The wind turbine is equipped with a lightning protection system to protect from the effects of direct and nearby strikes.</td></tr>
<tr><td>Figure 2-1 / Page 6</td><td>Basic Wind Turbine Generator Specifications</td><td>Basic Wind Turbine Generator Specifications figures (Figure 1-3a and Figure 1-3b). Please refer to Appendix A.</td></tr>
<tr><td>Section 3 / Page 8</td><td>The turbine array uses Enercon E-141 4.2 MW and Enercon E-141 4.0 MW wind turbines. The Enercon E-141 4.2 MW wind turbine generator has a maximum broadband sound power level of 105.5 decibels (dBA) where the same turbine at 4.0 MW has a maximum broadband sound power level of 104.5 dBA. The turbine at both MW levels has a <1 dBA measurement uncertainty, a tonal audibility of <2dB and a maximum tonality across the entire power range of 1dB. Further information regarding the octave band spectra can be found in Table 3-1.

Table 3-1: Enercon ~~E-141~~ 4.2 MW Turbines Linear Octave Band Sound Power Levels

<table><tr><th rowspan="2">Frequency (Hertz)</th><th colspan="2">Type of Turbine</th></tr><tr><th>4.2MW</th><th>4.0MW</th></tr><tr><td>31.5</td><td>116.3 dB</td><td>115.5 dB</td></tr><tr><td>63.0</td><td>114.6 dB</td><td>113.7 dB</td></tr><tr><td>125.0</td><td>110.4 dB</td><td>109.5 dB</td></tr><tr><td>250.0</td><td>106.1 dB</td><td>105.2 dB</td></tr><tr><td>500.0</td><td>103.7 dB</td><td>102.7 dB</td></tr><tr><td>1000.0</td><td>99.9 dB</td><td>98.8 dB</td></tr><tr><td>2000.0</td><td>95.7 dB</td><td>94.6 dB</td></tr><tr><td>4000.0</td><td>87.6 dB</td><td>86.5 dB</td></tr><tr><td>8000.0</td><td>69.0 dB</td><td>67.7 dB</td></tr></table>
Note: The above levels were calculated based on a wind speed emission of 7.5 m/s</td><td>The turbine array uses 10 Enercon E-141 EP4 ~~4.2 MW~~ turbines (or acoustically equivalent) and 2 ~~Enercon E-141 4.0 MW~~ Vestas V136 SO3 wind turbines (or acoustically equivalent). The ~~Enercon E-141 4.2 MW~~ Vestas V136 SO3 (or acoustically equivalent) will have a maximum broadband sound power level of 104.5 decibels (dBA). The Enercon E-141 EP4 (or an acoustically equivalent) ~~4.2 MW~~ ~~wind~~ turbine generator ~~has~~ will have a maximum broadband sound power level of 105.5 ~~decibels (~~dBA~~) where the same turbine at 4.0 MW has a maximum broadband sound power level of 104. The turbine at both MW levels has a <1 dBA measurement uncertainty, a tonal audibility of <2dB and a maximum tonality across the entire power range of 1dB.~~ The tonal audibility of the Enercon E-141 EP4 turbines (or acoustically equivalent) is 2 dB. The tonal audibility of the Vestas V136 SO3 wind turbines (or acoustically equivalent) is 2.6 dB. The measurement uncertainty for the Enercon E-141 EP4 turbines (or acoustically equivalent) is +1 dB. The measurement uncertainty for the Vestas V136 SO3 wind turbines (or acoustically equivalent) is 0.8 to 2.0 dB. Both turbines have a maximum tonality across the entire power range of up to 1 dB. Further information regarding the octave band spectra can be found in Table 3-1.

Table 3-1: Enercon ~~E-141~~ 4.2 MW and ~~E-101~~ Vestas 3.12 MW Turbines Linear Octave Band Sound Power Levels

<table><tr><th rowspan="2">Frequency (Hertz)</th><th colspan="3">Type of Turbine</th></tr><tr><th>Enercon 4.2MW</th><th>~~4.0MW~~</th><th>Vestas V136 SO3 3.12 MW</th></tr><tr><td>31.5</td><td>~~116.3~~ 115.8 dB</td><td>~~115.5 dB~~</td><td>115.5 dB</td></tr><tr><td>63.0</td><td>~~114.6~~ 114.1 dB</td><td>~~113.7 dB~~</td><td>113.7 dB</td></tr><tr><td>125.0</td><td>~~110.4~~ 110.0 dB</td><td>~~109.5 dB~~</td><td>109.5 dB</td></tr><tr><td>250.0</td><td>~~106.1~~ 106.1 dB</td><td>~~105.2 dB~~</td><td>105.2 dB</td></tr><tr><td>500.0</td><td>~~103.7~~ 104.0 dB</td><td>~~102.7 dB~~</td><td>102.7 dB</td></tr><tr><td>1000.0</td><td>~~99.9~~ 99.8 dB</td><td>~~98.8 dB~~</td><td>98.7 dB</td></tr><tr><td>2000.0</td><td>~~95.7~~ 95.0 dB</td><td>~~94.6 dB~~</td><td>94.6 dB</td></tr><tr><td>4000.0</td><td>~~87.6~~ 86.7 dB</td><td>~~86.5 dB~~</td><td>87.5 dB</td></tr><tr><td>8000.0</td><td>~~69.0~~ 68.2 dB</td><td>~~67.7 dB~~</td><td>72.1 dB</td></tr></table>
Note: ~~The above levels were calculated based on a wind speed emission of 7.5 m/s~~ The noise levels for the Enercon 4.2 MW (or acoustically equivalent) wind turbines correspond to 7 m/s wind speeds at 10 metre height (10.5 m/s at hub height). For the Vestas 3.12 MW (or acoustically equivalent) wind turbines, they correspond to 13 m/s wind speeds at 10 metre height (19 m/s at hub height), with positive adjustments.</td></tr>
<tr><td colspan="3">Heritage Impact Assessment Report</td></tr>
<tr><td>Section 1.1</td><td>The Project will use wind to generate electricity through the use of commercial wind turbine technology. The</td><td>The Project will use wind to generate electricity through the use of commercial wind turbine technology. The</td></tr>
</table>

Table 1-2: Edits to the REA Reports

Section / Page in REA Report	REA Report Text	Revised Text (~~Strikethrough text~~ represents deletions, underlined text represents additions and text in *italics* represents comments.)
	proposed wind turbine for this project is the Enercon E-141 turbine. The Project's nameplate capacity is up to 50 MW and the wind farm will consist of 12 turbines. The Project is categorized as a Class 4 wind facility and will be in compliance with the requirements outlined for such facilities. The wind turbine generators will be approximately 130 metres (m) tall and will consist of three blades, each approximately 67 m in length.	proposed wind turbine for this project ~~is~~ are the Enercon E-141 EP4 turbine (or an acoustically equivalent) and ~~Enercon E-101~~ Vestas V136 SO3 turbine (or an acoustically equivalent). The Project's nameplate capacity is up to 50 MW and the wind farm will consist of 12 turbines. The Project is categorized as a Class 4 wind facility and will be in compliance with the requirements outlined for such facilities. The wind turbine generators will be approximately ~~130~~ 129 metres (m) - 132 m tall and will consist of three blades, each approximately 67 m in length.
Natural Heritage Assessment - Site Investigations Report		
Section 1	The Project's nameplate capacity is up to 50 megawatts (MW) and the wind farm will consist of up to 12 turbines. The proposed turbine for the Project is the Enercon E-141 with a nameplate capacity of up to 4.2 MW.	The Project's nameplate capacity is up to 50 megawatts (MW) and the wind farm will consist of up to 12 turbines. The proposed turbines for the Project ~~is~~ are the Enercon E-141 EP4 (or an acoustically equivalent turbine) and Vestas V136 SO3 (or an acoustically equivalent turbine) with a nameplate capacity of up to 4.2 MW and 3.12 MW respectively.
Natural Heritage Assessment – Evaluation of Significance Report		
Section 1	The Project's nameplate capacity is up to 50 megawatts (MW) and the wind farm will consist of up to 12 turbines. The proposed turbine for the Project is the Enercon E-141 with a nameplate capacity of up to 4.2 MW.	The Project's nameplate capacity is up to 50 megawatts (MW) and the wind farm will consist of up to 12 turbines. The proposed turbines for the Project ~~is~~ are the Enercon E-141 EP4 (or an acoustically equivalent turbine) and Vestas V136 SO3 (or an acoustically equivalent turbine) with a nameplate capacity of up to 4.2 MW and 3.12 MW respectively.
Natural Heritage Assessment – Environmental Impact Study		
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Table 1-1	Make and Model: Enercon E-141 Hub Height: 129 m Rotor Diameter: 141 m	Make and Model: Ten (10) – Enercon E-141 EP4 (or an acoustically equivalent turbine) Hub Height: 129 m - 132 m Rotor Diameter: 136 m - 141 m Two (2) – Vestas V136 SO3 (or an acoustically equivalent turbine) Hub Height: 129 m - 132 m Rotor Diameter: 136 m - 141 m Cut-in Wind Speed: 3.0 m/s Cut-out Wind Speed: 27.5 m/s
Natural Heritage Assessment – Environmental Effects Monitoring Plan		
Section 2	The Project's nameplate capacity is up to 50 megawatts (MW) and the wind farm will consist of up to 12 turbines. The proposed turbine for the Project is the Enercon E-141 with a nameplate capacity of up to 4.2 MW.	The Project's nameplate capacity is up to 50 megawatts (MW) and the wind farm will consist of up to 12 turbines. The proposed turbines for the Project ~~is~~ are the Enercon E-141 EP4 (or an acoustically equivalent turbine) and Vestas V136 SO3 (or an acoustically equivalent turbine) with a nameplate capacity of up to 4.2 MW and up to 3.12 MW respectively.

2. Summary and Conclusion

This modification document and appendices have been prepared in consideration of Chapter 10, and specifically Section 3 of the Technical Guide to Renewable Energy Approvals (MOECC, 2017), which indicates this type of change during technical review period requires the submission of the required modification document and any relevant updated technical documents.

The proposed modifications to the REA reports described in this report are administrative in nature and would be considered a "Technical Change" as per the Technical Guide to Renewable Energy Approvals for the following reasons:

- **The updated location of T12 was implemented based on comments received from MOECC and is less than 10 metres from the location in the original REA application. The turbine location remains on land previously assessed and consulted on during the preparation of the REA application.**
- **The change in reference turbine at T3 and T5 to the Vestas V136 SO3 turbine (or acoustical equivalent) results in imperceptible changes to sound as originally presented within the Noise Impact Assessment.**

As outlined in Table 1-2, there are no substantive changes required to the REA reports included in the original application and the modifications to the Project do not result in the introduction of new environmental effects associated with the construction or operation of the Otter Creek Wind Farm.

3. References

AECOM, 2018:
Water Body Assessment. Otter Creek Wind Farm Limited Partnership.

AECOM, 2018a:
Water Body Report. Otter Creek Wind Farm Limited Partnership.