Environment



Jericho Wind, Inc.

Revision to the Water Assessment and Water Body Report – Jericho Wind Energy Centre

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Glossary of Terms

NextEra	NextEra Energy Canada, ULC
The Project	Jericho Wind Energy Centre
REA	Renewable Energy Approval

1. Introduction

Jericho Wind, Inc. (Jericho) is proposing to construct a wind energy project in the Municipality of Lambton Shores and the Township of Warwick, in Lambton County, Ontario and in the Municipality of North Middlesex, in Middlesex County, Ontario. The following sections of this Renewable Energy Approval (REA) Revision Report describe the proposed modifications to this Project and resulting updates to the Water Assessment and Water Body Report.

1.1 The Proponent

The Project will be owned and operated by Jericho, a wholly owned subsidiary of NextEra Energy Canada, ULC (NextEra). NextEra's indirect parent company is NextEra Energy Resources, LLC. The proponent has not changed from the initial REA submission.

The primary contacts for the Project are as follows:

Project Proponent	Project Consultant
Ross D. Groffman Director, Development NextEra Energy Canada, ULC 390 Bay Street, Suite 1720 Toronto, Ontario, M5H 2Y2	Marc Rose Senior Environmental Planner AECOM 300-300 Town Centre Blvd. Markham, Ontario L3R 5Z6
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1.2 Project Study Area

The proposed Project is located in the Municipality of Lambton Shores and the Township of Warwick, in Lambton County, Ontario and in the Municipality of North Middlesex, in Middlesex County, Ontario (refer to **Figure 2-1**). The Project Study Area has not changed from the initial REA submission.

The following co-ordinates define the external boundaries of the Project Study Area:

Easting	Northing
420938	4761752
419681	4780912
456597	4777307
453312	4766484

UTM Co-ordinates

2. Proposed Project Modifications

Jericho is proposing modifications to the Project. These proposed Project modifications are categorized as follows:

- Construction disturbance area modified to reduce or eliminate impacts to archaeological resources;
- Infrastructure or construction disturbance area added or changed to optimize project design/ constructability;
- Turbine and associated infrastructure removed.

Table 2-1 summarizes and documents the following about each of the proposed modifications:

- 1. A description of the modification and a rationale for why the modification is proposed; and
- 2. New potential environmental effects and corresponding mitigation measures.

Figure 2-1 illustrates the modified Project Location. **Appendix A** contains a series of figures showing the details for each of the modifications.

	Table 2-1 Summary of Project Modifications				
Label on Figure 2-1	Proposed Modification	Rationale for Proposed Modification	New Potential Environmental Effects (related to Water Bodies)	New Mitigation Measures (related to Water Bodies) ¹	
A1	Addition of Turbine 106 and associated access road and collection line, extending northeast from Turbine 4.	Infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	 Water body present within 120 m buffer of turbine and infrastructure (Feature ID R4.16-D). Turbine Increase to surface water temperature from reduced groundwater contribution if dewatering activities are required for excavation of turbine foundations. Increase to streamflows in watercourses that receive temporary groundwater dewatering discharge (if required). Groundwater discharge has potential to cause streambed and/or bank erosion and downstream sedimentation if not managed properly. Increase de orsion, sedimentation and turbidity in watercourse from clearing and grubbing on adjacent lands for construction of turbine, pad and turnaround area. Soil compaction, which may result in hardening of surfaces and increased runoff into watercourses. Release / discharge of runoff from the construction area, which has the potential to transport sediment and nutrients into the watercourse. Soil/water contamination by oils, grease and other materials from accidental spills and release of contaminants from construction equipment. Increase in impervious surfaces from presence of turbine foundation, resulting in increased water temperatures, increased surface runoff and stream peak flows, and reduced infiltration, base flows and upwelling. Access Road Increase of ronom sedimentation and turbidity from clearing and grubbing for construction of access roads. Soil/water contamination by oils, grease and other materials from construction equipment. Release / discharge of runoff from the construction area, which has the potential to transport sediment and nutrients into the watercourse. Soil/water contamination by oils, grease and other materials from construction activities such as dust suppression, equipment washing and land reclamation (e.g., hydroseeding). Increase of sucharge of runoff from the construction area, which has the potential to transport sediment and nutrients into the watercourse	Turbine • Timing windows • Erosion and sediment control • Grading and excavation • Material stockpiling and handling Access Road • Timing Windows • Erosion and sediment control • Grading and excavation • Equipment use • Material stockpiling and handling Collection Line • Equipment use • Erosion and sediment control	
A2	Relocation of access road to Turbine 4 to travel northeast from Jericho Road, and relocation of collection line to Turbine 4 near Kennedy Line.	Construction disturbance area modified to reduce or eliminate impacts to archaeological resources.	No new effects identified.	n/a	
A3	Relocation of access road and collection line to Turbine 6 to travel west from Northville Road and then north to Turbine 6; relocation of Turbine 6 construction disturbance area to the north.	Construction disturbance area modified to reduce or eliminate impacts to archaeological resources.	None – no water bodies identified in the new 120 m infrastructure buffer.	n/a	
A4	Relocation of Turbine 19 construction disturbance area 19 m to the southwest and addition of access road construction disturbance area near Jericho Road.	Construction disturbance area modified to reduce or eliminate impacts to archaeological resources.	No new effects identified.	n/a	
A5	Removal of access road and collection line to Turbine 24, addition of access road disturbance area between Turbine 22 and Turbine 24 and relocation of collection line to the access road disturbance area for Turbine 22.	Infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	 2 road crossings on the water body instead of 1(Feature ID R4.33-B). The potential environmental effects on the water body present in 120 m buffer and new access road crossing are listed below. Access Road Obstruction of lateral flows in watercourses from water crossings. Temporary disruption of substrates/habitat at locations where in-water work is required (culvert installations). Degradation of fish habitat from culvert installation. Increased erosion, sedimentation and turbidity from clearing and grubbing for construction of access roads. Soil/water contamination by oils, grease and other materials from construction equipment. Release / discharge of runoff from the construction area, which has the potential to transport sediment and nutrients into the watercourse. Reduction of streamflow due to the withdrawal of surface water for construction activities such as dust suppression, equipment washing and land reclamation (e.g., hydroseeding). Increase in impervious surfaces from presence of access road, resulting in increased water temperatures, increased surface runoff and stream peak flows, and reduced infiltration, base flows and upwelling. Soil/water contamination by oils, grease and other materials from maintenance activities. Obstruction of lateral flows in watercourses and other water bodies due to design of culverts and debris build-up at water crossings. 	 Access Road Culvert Design Isolated crossing Timing Windows Erosion and sediment control Grading and excavation Equipment use Material stockpiling and handling Water quality Water management Rehabilitation 	

¹ Refer to **Appendix B** for a detailed list of mitigation measures related to water bodies that were included in the Water Assessment and Water Body Report (AECOM, 2012)

	Table 2-1 Summary of Project Modifications			
Label on Figure 2-1	Proposed Modification	Rationale for Proposed Modification	New Potential Environmental Effects (related to Water Bodies)	New Mitigation Measures (related to Water Bodies) ¹
A6	Removal of a portion of construction disturbance area for access road and collection line to Turbines 21, 23 and 25.	Construction disturbance area modified to reduce or eliminate impacts to archaeological resources.	No new effects identified.	n/a
A7	Removal of Turbine 5 and associated access road and collection line.	Turbine and associated infrastructure removed.	None – removal of turbine and infrastructure.	n/a
B1	Relocation of Turbine 7 and associated construction disturbance area 148 m to the east.	Infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	No new effects identified.	n/a
B2	Addition of collection line in Gordon Road right-of-way, north of the road to Turbine 27.	Infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	 Water body present in 120 m buffer of collection line and within collection line crossing (Feature ID R3-C-1). Collection Line Release of pressurized drilling fluids into watercourses from fractures in substrate (also known as a 'frac-out'). Change to groundwater flow patterns which may affect groundwater discharge to watercourses. Increase in erosion and sedimentation from the entry and exit drill holes required for the directional drilling activities. This will require clearing and grubbing of the land and removal of substrates from the drill hole. Soil / water contamination by oils, gasoline, grease and other materials from accidental spills and release of contaminants from equipment. Release / discharge of runoff from the construction area, which has the potential to transport sediment and nutrients into the watercourse. 	Collection Line Directional drilling Water quality Water management Erosion and sediment control
B3	Removal of Turbine 31 and associated access road and collection line.	Turbine and associated infrastructure removed.	None – removal of turbine and infrastructure.	
B4	Addition of Turbine 32 construction disturbance area 34 m to the north and removal of the southeast portion of construction disturbance area.	Construction disturbance area modified to reduce or eliminate impacts to archaeological resources.	None – no water bodies identified in the new 120 m infrastructure buffer.	
C1	Relocation of Turbine 26 and associated construction disturbance area 101 m east. Access road relocated to travel north through the substation construction disturbance area and collection line relocated to the southern property boundary; and addition of construction disturbance area in Thompson Line right-of-way.	Infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	 Water body present in 120 m buffer of access road, and 120 m buffer of collection line and collection line crossing (Feature ID R4.16-A). Access Road Increased erosion, sedimentation and turbidity from clearing and grubbing for construction of access road. Soil/water contamination by oils, grease and other materials from construction equipment. Release / discharge of runoff from the construction area, which has the potential to transport sediment and nutrients into the watercourse. Reduction of streamflow due to the withdrawal of surface water for construction activities such as dust suppression, equipment washing and land reclamation (e.g., hydroseeding). Increase in impervious surfaces from presence of access road, resulting in increased water temperatures, increased surface runoff and stream peak flows, and reduced infiltration, base flows and upwelling. Soil/water contamination by oils, grease and other materials from maintenance activities. Collection Line Release of pressurized drilling fluids into watercourses from fractures in substrate (also known as a 'frac-out'). Change to groundwater flow patterns which may affect groundwater discharge to watercourses. Increase in erosion and sedimentation from the entry and exit drill holes required for the directional drilling activities. This will require clearing and grubbing of the land and removal of substrates from the drill hole. Soil / water contamination by oils, gasoline, grease and other materials from accidental spills and release of contaminants from equipment. 	Access Road Timing windows Erosion and sediment control Grading and excavation Equipment use Material stockpiling and handling Water quality Water management Collection Line Directional drilling Water quality Water management Erosion and sediment control
C2	Relocation of access road to Turbine 18 31 m to the north.	Construction disturbance area modified to reduce or eliminate impacts to archaeological resources.	None – no water bodies identified in the new 120 m infrastructure buffer.	n/a
C3	Addition of construction disturbance area for access road and collection line to Turbine 41.	Infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	No new effects identified.	n/a
C4	Addition of a spare 170 mVA transformer (XMR) to be stored within the existing footprint of the Jericho substation.	Infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	No new effects identified.	n/a
D1	Addition of construction disturbance area in the Northville Road right-of-way in two locations for collection line between Turbines 45 and 46.	New infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	None – no water bodies identified in the new 120 m infrastructure buffer.	
D2	Removal of a portion of construction disturbance area for access road and collection line to Turbine 56.	Construction disturbance area modified to reduce or eliminate impacts to archaeological resources.	No new effects identified.	n/a

	Table 2-1 Summary of Project Modifications				
Label on Figure 2-1	Proposed Modification	Rationale for Proposed Modification	New Potential Environmental Effects (related to Water Bodies)	New Mitigation Measures (related to Water Bodies) ¹	
D3	Relocation of Turbine 46 access road to travel north from Cedar Point Line and collection to travel east along the southern property boundary; and addition of construction disturbance area for collection line in the Northville Road right-of-way.	Construction disturbance area modified to reduce or eliminate impacts to archaeological resources.	 Water body present in 120 m buffer for access road and collection line (Feature ID R4E and R4D). Access Road Increased erosion, sedimentation and turbidity from clearing and grubbing for construction of access road. Soil/water contamination by oils, grease and other materials from construction equipment. Release / discharge of runoff from the construction area, which has the potential to transport sediment and nutrients into the watercourse. Reduction of streamflow due to the withdrawal of surface water for construction activities such as dust suppression, equipment washing and land reclamation (e.g., hydroseeding). Increase in impervious surfaces from presence of access road, resulting in increased water temperatures, increased surface runoff and stream peak flows, and reduced infiltration, base flows and upwelling. Collection Line Increase in erosion and sedimentation from the entry and exit drill holes required for the directional drilling activities. This will require clearing and grubbing of the land and removal of substrates from the drill hole. Soil / water contamination by oils, gasoline, grease and other materials from accidental spills and release of contaminants from equipment. 	Access Road • Erosion and sediment control • Grading and excavation • Equipment use • Material stockpiling and handling • Water quality • Timing windows • Water management Collection Line • Erosion and sediment control • Water management • Equipment use • Water quality	
D4	Addition of Turbine 112 and associated access road and collection line, extending south from Turbine 59.	New infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	None – no water bodies identified in the new 120 m infrastructure buffer.	n/a	
D5	Addition of construction disturbance area on private property to the north of Thompson Line to allow for installation of collection line and/or transmission line.	New infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	None – no water bodies identified in the new 120 m infrastructure buffer.	n/a	
D6	Addition of transmission line construction disturbance area on private property to allow for transmission line installation either in the Thomson Line right-of-way or on private property, within the disturbance area proposed to host collection line.	New infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	r No new effects identified.	n/a	
D7	Addition of collection line disturbance area on private property to allow for collection line installation either in the Thomson Line right-of-way or on private property, within the disturbance area proposed to host the transmission line.	New infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	No new effects identified.	n/a	
D8	Addition of collection line disturbance area on private property to allow for collection line installation either in the Thomson Line right-of-way or on private property, within the disturbance area proposed to host the transmission line.	New infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	r None – no water bodies identified in the new 120 m infrastructure buffer.	n/a	
D9	Addition of collection line disturbance area on private property to allow for collection line installation either in the Thomson Line right-of-way or on private property, within the disturbance area proposed to host the transmission line.	New infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	No new effects identified.	n/a	
D10	Relocation of transmission line construction disturbance area within natural areas located in the Thompson Line right-of-way.	Infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	No new effects identified.	n/a	
E1	Removal of Turbine 77 and associated access road and collection line / Removal and addition of portions of construction disturbance area for access road and collection line to Turbines 78, 79 and 107.	Turbine and associated infrastructure removed / Construction disturbance area modified to reduce or eliminate impacts to archaeological resources.	n No new effects identified.	n/a	
E2	Addition of Turbine 107 and associated access road and collection line, extending south from Turbine 79.	Infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	None – no water bodies identified in the new 120 m infrastructure buffer.	n/a	
E3	Relocation of Turbine 79 23 m to the east, within existing turbine construction disturbance area.	Construction disturbance area modified to reduce or eliminate impacts to archaeological resources.	No new effects identified.	n/a	
E4	Addition of construction disturbance area on private property to the north of Thompson Line to allow for installation of collection line and/or transmission line.	Infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	None – no water bodies identified in the new 120 m infrastructure buffer.	n/a	
E5	Relocation of transmission line construction disturbance area within natural areas located in the Thompson Line road right-of-way.	Infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	None – no water bodies identified in the new 120 m infrastructure buffer.	n/a	
E6	Relocation of transmission line construction disturbance area within natural areas located in the Thompson Line/Elginfield Road right-of-way.	Infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	None – no water bodies identified in the new 120 m infrastructure buffer.	n/a	

	Table 2-1 Summary of Project Modifications				
Label on Figure 2-1	Proposed Modification	Rationale for Proposed Modification	New Potential Environmental Effects (related to Water Bodies)	New Mitigation Measures (related to Water Bodies) ¹	
F1	Removal of a portion of construction disturbance area for access road and collection line to Turbine 43.	Construction disturbance area modified to reduce or eliminate impacts to archaeological resources.	No new effects identified.	n/a	
F2	Relocation of Turbine 44 access road 32 m to the west.	Construction disturbance area modified to reduce or eliminate impacts to archaeological resources.	No new effects identified.	n/a	
F3	Relocation of Turbine 90 access road and collection line to the north, extending to Townsend Line and addition of collection line in the Townsend Line right-of-way.	Construction disturbance area modified to reduce or eliminate impacts to archaeological resources.	None – no water bodies identified in the new 120 m infrastructure buffer.	n/a	
F4	Addition of Turbine 91 construction disturbance area 17 m to the west.	Infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	No new effects identified.	n/a	
F5	Removal of a portion of construction disturbance area for access road and collection line to Turbine 92.	Construction disturbance area modified to reduce or eliminate impacts to archaeological resources.	No new effects identified.	n/a	
F6	Removal of a portion of construction disturbance area for access road and collection line to Turbines 96 and 97.	Construction disturbance area modified to reduce or eliminate impacts to archaeological resources.	No new effects identified.	n/a	
G1	Addition of Turbine 62 construction disturbance area to the west and addition of collection line disturbance area in two locations in the Northville Road right-of-way.	Infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	No new effects identified.	n/a	
G2	Removal of the road and collection line to Turbine 63 and addition of road and collection line, extending west from Turbine 64 to Turbine 63.	Construction disturbance area modified to reduce or eliminate impacts to archaeological resources.	None – no water bodies identified in the new 120 m infrastructure buffer.	n/a	
G3	Removal of collection line construction disturbance area north of Birnam Line.	Infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	None – no water bodies identified in the new 120 m infrastructure buffer.	n/a	
G4	Relocation of collection line between Turbines 76 and 75 20 m to the south.	Construction disturbance area modified to reduce or eliminate impacts to archaeological resources.	None – no water bodies identified in the new 120 m infrastructure buffer.		
G5	Relocation of Turbine 76 access road and collection line 134 m to the west.	Construction disturbance area modified to reduce or eliminate impacts to archaeological resources.	No new effects identified. Removal of water body from 120 m infrastructure buffer however, 2 ponds remain in 120 m buffer.		
G6	Addition of Turbine 109 and associated construction disturbance area, access road and collection line; addition of collection line in Hickory Creek Line right-of-way.	Infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	 Water body present within 120 m buffer of turbine (Feature ID 9.29-F). Turbine Increase to surface water temperature from reduced groundwater contribution if dewatering activities are required for excavation of turbine foundations. Increase to streamflows in watercourses that receive temporary groundwater dewatering discharge (if required). Groundwater discharge has potential to cause streambed and/or bank erosion and downstream sedimentation if not managed properly. Increased erosion, sedimentation and turbidity in watercourse from clearing and grubbing on adjacent lands for construction of turbine, pad and turnaround area. Soil compaction, which may result in hardening of surfaces and increased runoff into watercourses. Release / discharge of runoff from the construction area, which has the potential to transport sediment and nutrients into the watercourse. Soil/water contamination by oils, grease and other materials from accidental spills and release of contaminants from construction equipment. Increase in impervious surfaces from presence of turbine foundation, resulting in increased water temperatures, increased surface runoff and stream peak flows, and reduced infiltration, base flows and upwelling. 	Turbine • Timing windows • Erosion and sediment control • Grading and excavation • Material stockpiling and handling	
H1	Addition of Turbine 108 and associated construction	Infrastructure or construction disturbance area added or changed to optimize project design/ constructability	No new effects identified.	n/a	
H2	Relocation of collection line from private property to Birnam Line right-of-way.	Construction disturbance area modified to reduce or eliminate impacts to archaeological resources.	None – no water bodies identified in the new 120 m infrastructure buffer.	n/a	
11	Relocation of Turbine 105 20 m to the south and addition of construction disturbance area.	Infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	No new effects identified.	n/a	
J1	Removal of Turbine 2 and associated access road and collection line.	Turbine and associated infrastructure removed	None – removal of turbine and infrastructure.	n/a	

			Table 2-1 Summary of Project Modifications
Label on Figure 2-1	Proposed Modification	Rationale for Proposed Modification	New Potential Environmental Effects (related to Water Bodies)
J2	Relocation of Turbine 1 and associated construction disturbance area, access road and collection line.	Infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	 Water body present within 120 m buffer of turbine (Feature ID R5.8). Turbine Increase to surface water temperature from reduced groundwater contribution if dewatering activities are excavation of turbine foundations. Increase to streamflows in watercourses that receive temporary groundwater dewatering discharge (if re Groundwater discharge has potential to cause streambed and/or bank erosion and downstream sedimer managed properly. Increase derosion, sedimentation and turbidity in watercourse from clearing and grubbing on adjacent la construction of turbine, pad and turnaround area. Soil compaction, which may result in hardening of surfaces and increased runoff into watercourses. Release / discharge of runoff from the construction area, which has the potential to transport sediment a the watercourse. Soil/water contamination by oils, grease and other materials from accidental spills and release of contam construction equipment. Increase in impervious surfaces from presence of turbine foundation, resulting in increased water tempe surface runoff and stream peak flows, and reduced infiltration, base flows and upwelling.
J3	Addition of Turbine 2 and associated construction disturbance area, access road and collection line.	Infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	 Water body present within 120 m buffer of turbine (Feature ID R4-J). Turbine Increase to surface water temperature from reduced groundwater contribution if dewatering activities are excavation of turbine foundations . Increase to streamflows in watercourses that receive temporary groundwater dewatering discharge (if re Groundwater discharge has potential to cause streambed and/or bank erosion and downstream sedimer managed properly. Increased erosion, sedimentation and turbidity in watercourse from clearing and grubbing on adjacent la construction of turbine, pad and turnaround area. Soil compaction, which may result in hardening of surfaces and increased runoff into watercourses. Release / discharge of runoff from the construction area, which has the potential to transport sediment a the watercourse. Soil/water contamination by oils, grease and other materials from accidental spills and release of contam construction equipment. Increase in impervious surfaces from presence of turbine foundation, resulting in increased water tempe surface runoff and stream peak flows, and reduced infiltration, base flows and upwelling.
J4	Relocation of Turbine 13 construction disturbance area 14 m southwest.	Construction disturbance area modified to reduce or eliminate impacts to archaeological resources.	No new effects identified.
K1	Relocation of transmission line construction disturbance area within natural areas located in the Elginfield Roac right-of-way.	New infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	None – no water bodies identified in the new 120 m infrastructure buffer.
K2	Addition of transmission line of construction disturbance area on private property to the north of Elginfield Road east of Pete Sebe Road.	New infrastructure or construction disturbance area added or , changed to optimize project design/ constructability.	None – no water bodies identified in the new 120 m infrastructure buffer.
К3	Addition of transmission line construction disturbance area on private property to the south of Elginfield Road, east of Roddick Road.	New infrastructure or construction disturbance area added or f changed to optimize project design/ constructability.	No new effects identified.
К1	Relocation of transmission line construction disturbance area within natural areas located in the Elginfield Road right-of-way.	Infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	No new effects identified.
K2	Addition of transmission line of construction disturbance area on private property to the north of Elginfield Road east of Pete Sebe Road.	Infrastructure or construction disturbance area added or , changed to optimize project design/ constructability.	No new effects identified.
К3	Addition of transmission line construction disturbance area on private property to the south of Elginfield Road, east of Roddick Road.	a Infrastructure or construction disturbance area added or f changed to optimize project design/ constructability.	No new effects identified.
K4	Addition of transmission line construction disturbance area on private property to the south of Elginfield Road, west of Kerwood Road.	Infrastructure or construction disturbance area added or f changed to optimize project design/ constructability.	No new effects identified.
K5	Relocation of transmission line construction disturbance area within natural areas located in the Elginfield Road right-of-way.	Infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	No new effects identified.

	New Mitigation Measures (related to Water Bodies) [†]
required for quired). Itation if not nds for	 Turbine Timing windows Erosion and sediment control Grading and excavation Material stockpiling and handling
nd nutrients into	
inants from	
ratures, increased	
required for quired). Itation if not nds for nd nutrients into inants from ratures, increased	 Turbine Timing windows Erosion and sediment control Grading and excavation Material stockpiling and handling
	n/a

	Table 2-1 Summary of Project Modifications							
Label on Figure 2-1	Proposed Modification	Rationale for Proposed Modification	New Potential Environmental Effects (related to Water Bodies)	New Mitigation Measures (related to Water Bodies) ¹				
K6	Relocation of transmission line construction disturbance area within natural areas located in the Elginfield Road right-of-way.	Infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	No new effects identified.	n/a				
K7	Relocation of transmission line construction disturbance area within natural areas located in the Elginfield Road right-of-way.	Infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	No new effects identified.	n/a				
K8	Relocation of transmission line construction disturbance area within natural areas located in the Elginfield Road right-of-way.	Infrastructure or construction disturbance area added or changed to optimize project design/ constructability.	No new effects identified.	n/a				



3. Edits to the Water Assessment and Water Body Report

Table 3-1 documents the edits to the Water Assessment and Water Body Report resulting from the modifications described above. The table includes the text from the original REA submission and edits to the text (underlined text represents additions and strikethrough text represents deletions). Updated figures are included in **Appendix C** of this Revision Report. A summary table documenting the results of additional site investigations related to the modifications is included in **Appendix D**.

Table 3-1 Edits to the Water Asse	ssment and Water Body Report
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Section / Page	Original Text		Revised Text			
			(<u>Ondernined</u> text represents additions and striketinough text repr			
Section 1.2 / page 3	The proposed Project Location is shown on Figure 1-2, and includes the locations of the components of	the Project listed below.	The proposed Project Location is shown on Figure 1-2, and includes the locations of the components of	of the Project listed below.		
	97 GE 1.6-100 Wind Turbine generator locations and pad mounted step-up transformers (how will ultimately be constructed);	• 97 99 GE 1.6-100 Wind Turbine generator locations and pad mounted step-up transformers (however, only approximately turbines will ultimately be constructed);				
Section 3.3 / page 26	Data collected during the Records Review stage, in particular the NRVIS layer mapping overlaid with na	Data collected during the Records Review stage, in particular the NRVIS layer mapping overlaid with r	natural features mapping and the			
	of project components, as well as air photo interpretation, determined that there were a total of 162 local overlapped with a water body or potential water body.	of project components, as well as air photo interpretation, determined that there were a total of 162 16 overlapped with a water body or potential water body.	6 locations where the Project Loc			
	Of these 162 sites, 136 locations were identified as potential permanent or intermittent streams within the sites were identified as potential ponds. These were included in the mapping for site investigations as in ecological function and to determine whether they meet the criteria for REA water body after field assess carried forward to field investigations as shown in Table 3-11.	he Project Location, while the remaining 26 t is important to assess their current ssment. Therefore a total of 162 sites were	Of these <u>166</u> sites, <u>136</u> locations were identified as potential permanent or intermittent streams within the Project Location, where remaining <u>26</u> <u>27</u> sites were identified as potential ponds. These were included in the mapping for site investigations as it is important t their current ecological function and to determine whether they meet the criteria for REA water body after field assessment. Therefore 162 166 sites were carried forward to field investigations as shown in Table 3-11			
Section 3.3 / page 26	Table 3-11		Table 3-11			
	Within 120 m of the average annual high water mark of a permanent or intermittent stream	Within 120 m of the average annual high water mark of a permanent or intermittent stream	162 <u>166</u>			
Section 4.4.2, Table 4-2/			*addition of 4 Site investigation tables, see Appendix C			
page 33						
Section 4.4.2/page 227	A total of 194 features were assessed during the water body assessment. Of these, there were a total of REA water bodies, classified as High Moderate and Low sensitivity and will be carried forward to the E	of 116 features that were determined to be	A total of 194 198 features were assessed during the water body assessment. Of these, there were a determined to be REA water bodies, classified as High Moderate and Low sensitivity and will be carried	total of 116 119 features that we		
	features were classified as non-REA water bodies and were not carried forward to the Effects Assessm	ent. The majority of features classified as	remaining 78 79 features were classified as non-REA water bodies and were not carried forward to the	e Effects Assessment. The major		
	non-REA were found to be tiled or buried watercourses and ponds that were dugout and/or man-made.	Of the 78 non-REA features, 36 are tiled,	features classified as non-REA were found to be tiled or buried watercourses and ponds that were due	gout and/or man-made. Of the 78		
	grassed waterways, or temporarily channels for surface drainage, 22 of which will be crossed by collect	ion lines and 17 that will be crossed by	REA features, 36 are tiled, grassed waterways, or temporarily channels for surface drainage, 22 of wh	ich will be crossed by collection li		
	access roads		that will be crossed by access roads			
Section 4.4.3/page 227	Alternative site investigations were conducted for 104 features, with physical site investigations being conducted for 104 features, with physical site investigations being conducted for 104 features, with physical site investigations being conducted for 104 features, with physical site investigations being conducted for 104 features, with physical site investigations being conducted for 104 features, with physical site investigations being conducted for 104 features, with physical site investigations being conducted for 104 features, with physical site investigations being conducted for 104 features, with physical site investigations being conducted for 104 features, with physical site investigations being conducted for 104 features, with physical site investigations being conducted for 104 features, with physical site investigations being conducted for 104 features, with physical site investigations being conducted for 104 features, with physical site investigations being conducted for 104 features, with physical site investigations being conducted for 104 features, with physical site investigations being conducted for 104 features, with physical site investigations being conducted for 104 features, with physical site investigations being conducted for 104 features, with physical site investigations being conducted for 104 features, with physical site investigations being conducted for 104 features, with physical site investigations being conducted for 104 features, with physical site investigations being conducted for 104 features, with physical site investigations being conducted for 104 features, with physical site investigations being conducted for 104 features, with physical site investigations being conducted for 104 features, with physical site investigations being conducted for 104 features, with physical site investigations being conducted for 104 features, with physical site investigations being conducted for 104 features, with physical site investigations being conducted for 104 features, with phys	onducted at 89 locations (access to	readside or adjacent properties), and 15 site assessments using air photo interpretation. These Alternative Site Investigations were co			
	land access to all or partial number of land parcels required to complete the full water body assessment	t was not granted. Appendix F provides a	land access to all or partial number of land parcels required to complete the full water body assessmel	nt was not granted. Appendix F		
	summary of the Alternative Site Investigations conducted for the Jericho Wind Energy Centre		summary of the Alternative Site Investigations conducted for the Jericho Wind Energy Centre	5 11		
Section 4.5/page 227	A total of 32 new features were identified after site investigations, of these 27 were pond features and 5	were new watercourses	A total of 32 33 new features were identified after site investigations, of these 27 28 were pond feature	es and 5 were new watercourses		
Section 4.6/page 227-	A total of 162 potential water bodies (26 ponds, 136 watercourses) were identified in the vicinity of the F	Project Location during the Records	A total of <u>162</u> <u>166</u> potential water bodies (<u>26 27</u> ponds, <u>136</u> <u>139</u> watercourses) were identified in the vi	icinity of the Project Location duri		
228	of 194 features.	e found identified and assessed for a total	for a total of 194 198 features.			
	Of the 194 features investigated:		Of the 194 198 features investigated:			
	 78 were identified as non-REA water bodies because they did not fit the REA definition of a wathis report. 	ater body as outlined in Section 1.3 of	• 78 <u>79</u> were identified as non-REA water bodies because they did not fit the REA definition of a water body as outlined in Sec 1.3 of this report.			
	A total of 116 features were carried forward to the Effects Assessment. This is summarized be	elow in Table 4-3.	A total of <u>116</u> features were carried forward to the Effects Assessment. This is summarized	zed below in Table 4-3.		
Section 4.6/page 228	Table 4-3 Summary of Water Bodies in the Project Study Area Confirmed through Carried Forward to Effects Assessment	Site Investigations and	Table 4-3 Summary of Water Bodies in the Project Study Area Confirmed throug Carried Forward to Effects Assessment	h Site Investigations and		
	Process stage	Number of Water Bodies	Process stage	Number of Water Bodies		
	Features identified through Records Review	162	Features identified through Records Review	162 - <u>166</u>		
	Additional features identified through site investigations	32	Additional features identified through site investigations	32		
	Total sites visited for field investigations	=194	Total sites visited for field investigations	= 19 4 <u>198</u>		
	Features identified as non-REA water bodies	(79)	Features identified as non-REA water bodies	(79)		
	Features identified as REA water bodies carried forward to Effects Assessment	=116	Features identified as REA water bodies carried forward to Effects Assessment	= 116 <u>119</u>		
Section 4.6/page 228	With regard to the location of the Project Components in relation to the 116 REA water bodies:		With regard to the location of the Project Components in relation to the 116 119 REA water bodies:			
	 25 are located within 120 m of a wind turbine; 62 are crossed by a collection line, with an additional 25 located within 120 m of a collection line 19 are crossed by an access road, with an additional 24 located within 120 m of an access road 19 are crossed by overhead wires for a transmission line and 8 are located within 120 m of the substation and laydown area; and, 2 are located within 120 m of meteorological towers 	 25 <u>27</u> are located within 120 m of a wind turbine; 62 <u>64</u> are crossed by a collection line, with an additional <u>25 <u>28</u> located within 120 m of a collection line;</u> 19 <u>21</u> are crossed by an access road, with an additional <u>24 <u>28</u> located within 120 m of an access road;</u> <u>17</u> are crossed by overhead wires for a transmission line and 8 <u>10</u> are located within 120 m of the transmission line; 2 are located within 120 m of the substation and laydown area; and, 2 are located within 120 m of meteorological towers 				
	Please note that many of the 116 water bodies intersect more than one Project Component		Please note that many of the 116 119 water bodies intersect more than one Project Component			

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e locations cation

nile the assess a total of

anent or intermittent stream	162 <u>166</u>

e nent. The rity of 8 <u>79</u> non-lines and 17

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assessed

tion

Table 3-1 Edits to the Water Assessment and Water Body Report

Section / Page	Original Text			R (<u>Underlined</u> text represents additior		
Section 5.2.1 / page 241	Although Jericho Wind, Inc. is seeking an REA for up to 97 turbine locations, approximately 92 turbines are proposed to be constructed for the Project.			Although Jericho Wind, Inc. is Project.	s seeking an REA fo	or up to 97 <u>99</u> turbir
Section 5.2.1 / page 242	There are 25 water bodies loc details)).	ated within 120 m of	There are 25 <u>27</u> water bodies further details)).	s located within 120	m of the Project Lo	
Section 5.2.2 / page 243	In the Project Location, there are 19 water bodies that will require a watercourse crossing through installation of a culvert. There are 25 water bodies located within the 120 m buffer of an access road (Figure 4-2).				are 19 <u>21</u> water bo m buffer of an acce	dies that will require ess road (Figure 4-2
Section 5.2.3 / page 244	There are 62 locations where water bodies located within the	collection lines will be e 120 m of collection	e installed via horizontal directional drilling underneath water bodies. There are 26 additional lines (Figure 4-2).	There are 62 64 locations wh additional water bodies locate	ere collection lines ed within the 120 m	will be installed via of collection lines (
Section 5.2.4 / page 246	There are 19 water body cross 120 m of the transmission line	sings associated with (Figure 4-2).	the installation of the overhead transmission line and 8 additional water bodies located within	There are 19 <u>17</u> water body of within 120 m of the transmiss	crossings associated	d with the installatio).
Table 5-2/ page 255	Activity	Project Component	Water Body Location and Sensitivity	Activity	Project Component	
	Construction and Decommissioning	Turbine •	High Sensitivity – R2.101, R2.18, R2.73 Moderate Sensitivity – R2.102, R2.10-B, R2.76, R4-B, R4-I, R4.11-B, R4.16-B, R4.16-C, R4.25-C, R4.33-B, R4.59, R4.8-B, R4.8-D, R5.8, R6-B, R6.18-B, R9-B, R9.29-D Low Sensitivity – R4-E, R4.36, R8.10, P3.44	Construction and Decommissioning	Turbine	 High Sensitivity Moderate Sens R4.25-C, R4.33- Low Sensitivity
	Operations	Turbine •	High Sensitivity R2.101, R2.18, R2.73 Moderate Sensitivity R2.102, R2.10-B, R2.76, R4-B, R4-I, R4.11-B, R4.16-B, R4.16-C, R4.25-C, R4.33-B, R4.59, R4.8-B, R4.8-D, R5.8, R6-B, R6.18-B, R9-B, R9.29-D Low Sensitivity R4.6, R8.10, P3.44	Operations	Turbine	 High Sensitivity Moderate Sens R4.25-C, R4.33- Low Sensitivity
T 11 5 0/ 050						
Table 5-3/ page 256	Construction and Decommissioning	Road Crossing	 Moderate Sensitivity – R2.10-B, R3.22, R4-D, R4.16-B, R4.33-B, R4.8-B, R4.8-D, R4.25-B, R4.61-B, R5.8, R6.18-B, R6.18-D, R9.29-C, R9.29-D, R9.29-F Low Sensitivity – R3.70, R4.36, R4.58, R8.10 	Construction and Decommissioning	Road Crossin	• Moderate R4.25-B, • Low Sens
		Access Road and Associated Buffer	Road Crossing • Moderate Sensitivity – R2.10-B, R3.22, R4-D, R4.16-B, R4.33-B, R4.8-B, R4.8-D, R4.25-B, R4.61-B, R5.8, R6.18-B, R6.18-D, R9.29-C, R9.29-D, R9.29-F • Low Sensitivity – R3.70, R4.36, R4.58, R8.10 Within 120 m of an access road		Access Road a Associated But	ffer Road Cross • Moderate R4.33-B, D, R9.29- • Low Sens Within 120
	Operations	Road Crossing	 High Sensitivity – R2.18, R2.73, P2.18 Moderate Sensitivity – R2.102, R2.76, R3-C, R3-D, R4-B, R4-C, R4-I, R4.11-B, R4.16-C, R4.25-A, R4.25-C, R4.31, R4.59, R4.8-E, R6-B, R6.20-A, R9-B Low – R4-E, R4.22, R4.51, P3.44 Moderate Sensitivity – R2 10-B, R3.22, R4-D, R4.16-B, R4.33-B, R4.8-B, R4.8-D, R4.25- 			 High Sen Moderate R4.16-C, Low – R4
			B, R4.61-B, R5.8, R6.18-B, R6.18-D, R9.29-C, R9.29-D, R9.29-F • Low Sensitivity – R3.70, R4.36, R4.58, R8.10	Operations	Road Crossin	• Moderate R4.25-B, • Low Sens

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ne locations, approximately 92 turbines are proposed to be constructed for the

ocation for turbines (measured from the tip of blades (see Section 1.2 for

e a watercourse crossing through installation of a culvert. There are 25 water 2)

horizontal directional drilling underneath water bodies. There are <u>26 28</u> (Figure 4-2).

on of the overhead transmission line and 8 10 additional water bodies located

Water Body Location and Sensitivity

ay – R2.101, R2.18, R2.73 **sitivity** – R2.102, R2.10-B, R2.76, R4-B, R4-I, R4.11-B, R4.16-B, R4.16-C, **b**-B, R4.59, R4.8-B, R4.8-D, R5.8, R6-B, R6.18-B, R9-B, R9.29-D, <u>R4-J</u> **ty** – R4-E, R4.36, R8.10, P3.44 **ty** – R2.101, R2.18, R2.73 **sitivity** – R2.102, R2.10-B, R2.76, R4-B, R4-I, R4.11-B, R4.16-B, R4.16-C, **b**-B, R4.59, R4.8-B, R4.8-D, R5.8, R6-B, R6.18-B, R9-B, R9.29-D, <u>R4-J</u> **ty** – R4-E, R4.36, R8.10, P3.44

Sensitivity – R2.10-B, R3.22, R4-D, R4.16-B, R4.33-B, R4.8-B, R4.8-D, R4.61-B, R5.8, R6.18-B, R6.18-D, R9.29-C, R9.29-D, R9.29-F
 sitivity – R3.70, R4.36, R4.58, R8.10

sing

E Sensitivity – R2.10-B, R3.22, R4-D<u>, R4-E, R4.16-A</u>, R4.16-B, <u>R4.16-D</u>, R4.8-B, R4.8-D, R4.25-B, R4.61-B, R5.8, R6.18-B, R6.18-D, R9.29-C, R9.29-F

sitivity – R3.70, R4.36, R4.58, R8.10

m of an access road

sitivity – R2:18R2:73, P2:18 Sensitivity – R2:102, R2:76, R3-C, R3-D, R4-B, R4-C, R4-I, R4:11-B, R4:25-A, R4:25-C, R4:31, R4:59, R4:8-E, R6-B, R6:20-A, R9-B I-E, R4:22, R4:51, P3:44 Sensitivity – R2:10-B, R3:22, R4-D, R4:16-B, R4:33-B, R4:8-B, R4:8-D, R4:61-B, R5:8, R6:18-B, R6:18-D, R9:29-C, R9:29-D, R9:29-F sitivity – R3:70, R4:36, R4:58, R8:10

Table 3-1 Edits to the Water Assessment and Water Body Report

Section / Page	Original Text			Revised Text (<u>Underlined</u> text represents additions and strikethrough text represents deletions)					
Table 5-4/ page 257	7 Activity Project Component Water Body Location and Sensitivity		Activity Project Component Water Body Location and Se						
	Construction	Collection Line Crossing	 High Sensitivity – R2.14 Moderate Sensitivity – R2.10-B, R2.131, R2.179, R2.186, R2.192, R2.27, R3-A, R3-B, R3-D, R3.28, R3.53, R3.22, R3.66, R4-C, R4-D, R4-F, R4-G, R4-H, R4.25-A, R4.25-B, R4.11-B, R4.16-B, R4.33-A, R4.33-B, R4.50, R4.8-A, R4.8-B, R4.8-D, R4.61-B, R4.61-C, R5, R5.8, R6.18-B, R6.18-C, R6.18-D, R6.20-B, R6-C, R8.12, R9.29-A, R9.29-B, R9.29-D, R9.29-F, R12.54-A, P6.3 Low Sensitivity – R2.140-B, R2.28, R2.281, R2.34, R3.38, R3.46, R3.70, R4-A, R4.36, R4.58, R4.61-A, R4.62, R4.8-C, R5.10, R8.10, R12.54-B 	Construction	Collection Line Crossing	 High Sensitivity – R2.14 Moderate Sensitivity – R2.10-B, R2.131 R3.28, R3.53, R3.22, R3.66, R4-C, R4-D, <u>R4.16-A</u>, R4.16-B, R4.33-A, R4.33-B, R4 R5.8, R6.18-B, R6.18-C, R6.18-D, R6.20 R12.54-A, P6.3, <u>R3-C-1</u> Low Sensitivity – R2.140-B, R2.28, R2.2 R4.61-A, R4.62, R4.8-C, R5.10, R8.10, R 	, R2.179, R2.186, I R4-F, R4-G, R4-H 50, R4.8-A, R4.8-E B, R6-C, R8.12, R 281, R2.34, R3.38, 12.54-B	R2.192, R2.27 , I, R4.25-A, R4.2 3, R4.8-D, R4.6 9.29-A, R9.29-E R3.46, R3.70, F	R3-A, R3-B, R3-D, 5-B, R4.11-B, I-B, R4.61-C, R5, , R9.29-D, R9.29-F, R4-A, R4.36, R4.58,
		Collection Line Crossing and Associated Buffer	 Collection Line Crossing High Sensitivity – R2.14 Moderate Sensitivity – R2.10-B, R2.131, R2.179, R2.186, R2.192, R2.27, R3-A, R3-B, R3-D, R3.28, R3.53, R3.22, R3.66, R4-C, R4-D, R4-F, R4-G, R4-H, R4.25-A, R4.25-B, R4.11-B, R4.16-B, R4.33-A, R4.33-B, R4.50, R4.8-A, R4.8-B, R4.8-D, R4.61-B, R4.61-C, R5, R5.8, R6.18-B, R6.18-C, R6.18-D, R6.20-B, R6-C, R8.12, R9.29-A, R9.29-B, R9.29-D, R9.29-F, R12.54-A, P6.3 Low Sensitivity – R2.140-B, R2.28, R2.281, R2.34, R3.38, R3.46, R3.70, R4-A, R4.36, R4.58, R4.61-A, R4.62, R4.8-C, R5.10, R8.10, R12.54-B Within 120 m of construction of a collection line High Sensitivity – R2.18, P2.136, P2.18 Moderate Sensitivity –R2.76, R3.73, R3.74, R4-I, R4.16-C, R4.25-C, R4.31, R4.8-E, R6.20-A, Low Sensitivity –R3.64, R4-E, R4.27, R4.22, R4.51, R4.60, R6.18-A, R9.29-E, P2.142, P2.30, P3.44, P4.47, P12.22 		Collection Line Crossing and Associated Buffe	R4.61-A, R4.62, R4.6-C, R5.10, R8.10, R12.54-B Collection Line Crossing and Buffer High Sensitivity – R2.14 Moderate Sensitivity – R2.10-B, R2.131, R2.179, R2.186, R2.192, R2.22 R3.28, R3.53, R3.22, R3.66, R4-C, R4-D, R4-F, R4-G, R4-H, R4.25-A, R4-R4.16-A, R4.16-B, R4.33-A, R4.33-B, R4.50, R4.8-A, R4.8-B, R4.8-D, R4. R5.8, R6.18-B, R6.18-C, R6.18-D, R6.20-B, R6-C, R8.12, R9.29-A, R9.29 R12.54-A, P6.3, R3-C-1 Low Sensitivity – R2.140-B, R2.28, R2.281, R2.34, R3.38, R3.46, R3.70 R4.61-A, R4.62, R4.8-C, R5.10, R8.10, R12.54-B Within 120 m of construction of a collection line High Sensitivity – R2.18, P2.136, P2.18 Moderate Sensitivity – R2.76, R3.73, R3.74, R4-D, R4-I, R4.16-A, R4.16 R4.31, R4.8-E, R6.20-A,		R2.192, R2.27 , I, R4.25-A, R4.2 3, R4.8-D, R4.61 9.29-A, R9.29-E R3.46, R3.70, F <u>4.16-A</u> , R4.16-C , R6.18-A, R9.2	R3-A, R3-B, R3-D, 5-B, R4.11-B, -B, R4.61-C, R5, , R9.29-D, R9.29-F, R4-A, R4.36, R4.58, , <u>R4.16-D,</u> R4.25-C, 9-E, P2.142, P2.30,
	Operation / Decommissioning	N/A	• N/A	Operation / Decommissioni	N/A ng	P3.44, P4.47, P12.22 ● N/A			
Section 6/ page 269	Through a combination 116 REA water bodies	of Records Review, as were identified in the J	rial photography interpretation, reconnaissance site visits, and site investigations, a total of ericho Project Study Area.	Through a combina 116 119 REA wate	ation of Records Review, r bodies were identified in	aerial photography interpretation, reconnaissa n the Jericho Project Study Area.	nce site visits, and	site investigatio	ns, a total of
Appendix E				Add: Scanned field	I notes of sites visited in .	July 2013.			
Appendix G				Add:					
				June 20	D, 2013 R4.16-D, P4.	51, R3-C-1 16.9°C; 0 mm of precipitation	10:00-16:30	C. Boros A. Arsenault	C. Boros
				July 12	2, 2013 R4-	J 20.7°C; 0 mm of precipitation	9:50-10:50	S. Lohnes J. Piette	S. Lohnes
Appendix J				Add:					
				P4.51	New feature observ	ved – previously unmapped A du	gout pond was obs	served	

Note: *No site investigation tables need to be removed from Table 4-2. All Feature write ups are still relevant.

4. Summary and Conclusions

The Project modifications described in this REA Revision Report do not change the overall conclusion of the Water Assessment and Water Body Report which states that "all of the potential effects from the construction and operation of this Project can be mitigated so that the effect on the water bodies are reduced to no residual effects, or low in the case of water body crossings".



Appendix A

Project Modifications



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Appendix B

Water Body Mitigation Measures

Mitigation Measures

Mitigation techniques are proposed to offset possible effects of the construction, decommissioning and operation activities of the Jericho Wind Energy Centre. Mitigation measures recommended to minimize risk associated with potential impacts to the water bodies include the implementation of standard Best Management Practices (BMPs), as described below.

BMPs are work practices that outline acceptable practices to follow when carrying out certain activities. DFO has developed a series of operational statements as guidelines to avoid conditions that may harmfully alter aquatic habitat. These DFO operational plans are being used in conjunction with standard mitigation measures that are implemented to protect surface water quality and the aquatic ecosystem.

The following are applicable to this Project:

Work Area

- Stabilize banks where necessary, minimizing the area and duration of soil exposure.
- Operate machinery on land and in a manner that minimizes disturbance to stream banks.
- Erect sediment fencing around water bodies and areas to be avoided (i.e., near unstable banks, vegetation communities).
- Locate staging areas away from watercourses and if possible out of the regulated floodplain to limit risk of impacts to aquatic habitat and surface water quality from accidental spills.
- Keep vegetation removal to a minimum.

Equipment Use

- Ensure machinery arrives on site in a clean, washed condition and is maintained free of fluid leaks.
- Minimize vehicle traffic on exposed soils, avoid compacting or other hardening of natural ground surface, and avoid the movement of heavy machinery on areas with sensitive slopes.
- Limit speed of vehicles near watercourse crossings.

Erosion and Sediment Control

- Develop and implement an erosion and sediment control plan before commencement of construction.
- Utilize erosion blankets, erosion control fencing, straw bales, etc., where necessary to mitigate potential excessive erosion and sedimentation. Ensure any materials placed in floodline are free from silt and other such particles. Extra erosion and sediment control materials will be kept on site (*e.g.*, heavy duty silt fencing, strawbales).
- Check that erosion control tools are in good repair and properly functioning prior to conducting daily work and reinstall or repair as required prior to commencing daily construction activities.
- Keep sediment and erosion control measures in place until disturbed areas have been stabilized (i.e., re-vegetated).
- To avoid sedimentation in wetlands and watercourses, schedule grading within 30 m of a watercourse or wetland to avoid times of high runoff volumes, wherever possible. Temporarily suspend work if high runoff volume is noted or excessive flows of sediment discharges occur until contingency measures are in place.
- Re-vegetate temporary roads to pre-construction conditions as soon as possible after construction activities are complete using species native to the area in naturally vegetated areas.

Maintenance

- Maintain and repair permanent and temporary erosion and sediment control measures as needed to ensure continued performance of their intended function for the duration of the works.
- Remove temporary erosion and sediment control measures after the final site stabilization is achieved.
- Permanently stabilize disturbed soil resulting from removal of BMPs or vegetation.

Material Stockpiling and Handling

- Store any stockpiled materials at least 30 m away from a wetland, woodland or water body. Develop a spill response plan and train staff on associated procedures.
- Dispose of any waste material from construction activities by authorized and approved off-site vendors.

Grading and Excavation

• Minimize changes in land contours and natural drainage; maintain timing and quantity of flows. Any grading of lands adjacent to water body features should match existing grades at the identified set-back, or buffer from the features.

Timing Windows

- Schedule construction activities that occur within 30 m of watercourses to avoid periods of critical habitat use (i.e., spawning) to the extent possible. These timing windows are applied to protect fish from any works in and around water during spawning, migration and other critical life history stages. Construction timing windows are based on site specific criteria such as type of fish species present, thermal regime and fish spawning times (spring or fall). There are generic restricted in-water work timing windows established by the DFO.
- Specific timing windows for this project may be developed in consultation with ABCA and SCRCA.

Isolated Crossing

- In-water works for permanent water bodies must occur in the dry and via the dam and pump method to maintain fish
 passage during in-water works. For intermittent water bodies, work is preferred to be completed in the dry and carried
 out during seasonally dry times or when the water body is frozen to the bottom.
- Develop and implement a fish rescue plan for dewatering areas. This will include appropriate sized end-of-pipe fish screen to prevent potential losses of fish due to entrainment or impingement as outlined in the DFO – Freshwater Intake End-of-Pipe Fish Screen Guideline.

Culvert Design

- Design and install culverts to prevent creation of barriers to fish movement and maintain bankfull channel functions.
- Install open bottom crossing structures where possible.
- Design culverts to accommodate high flows of the watercourse by undertaking hydraulic engineering studies.
- Embed the culvert below the streambed to maintain lateral flow.
- Install adequate gravel base to maintain flow of shallow groundwater.

- Locate crossings within straight sections of the stream, perpendicular to the bank. Avoid crossings on meander bends, braided streams and any other unstable areas.
- Use only clean material (i.e., rock or coarse gravel) for approaches to culverts.
- Regularly maintain culverts to ensure no debris build-up is impeding stream flow.

Water Quality

- Develop a spill response plan and train construction staff on associated procedures.
- Maintain emergency spill kits on construction site.
- Pass groundwater from dewatering activities (if required) through a sediment filtration system prior to being discharged to a watercourse.
- Control soil / water contamination through best management practices.

Dewatering Activities (if necessary)

- Confirm the zone of influence of required dewatering activities prior to construction.
- For turbines within the sand and/or gravel deposits, schedule dewatering activities to take place during a seasonally dry time of year where possible.
- Limit duration of dewatering to as short a time frame as possible
- Implement groundwater cut-offs as required to limit water taking quantities.
- Limit dewatering where turbines are constructed within the sand and/ or gravel deposits to less than 40,000 L/day.

Water Management

- Control rate and timing of water pumping; pump from deep wells to infiltration galleries adjacent to water bodies or wetlands.
- Control rate and timing of water pumping from surface water features.
- Control quantity and quality of stormwater discharge using best management practices (e.g., use of a permeable surface for access roads, complete Stormwater Pollution Prevention Study to address any potential effects associated with stormwater runoff for the Operations and Maintenance Building prior to construction).
- Restrict taking groundwater and surface water during drought conditions.
- Regulate the discharge of water-taking (if required) to ensure that there is no flooding in the downstream area and no soil erosion, or stream channel scouring is caused at the point of discharge. A discharge diffuser or other energy dissipation device will be used, if necessary, to mitigate flows which physically alter the stream channel or banks.
- Install siltation control measures that are sufficient for the volumes pumped at both the taking location upstream
 of the construction site and (if necessary) the discharge site. All measures will be taken to properly maintain
 these control devices throughout the construction period.
- Maintain vegetative buffers around water bodies.

Horizontal Directional Drilling

- Conduct all drilling by licensed drillers in accordance with Regulation 903 under *Ontario Water Resources Act*, R.S.O. 1990.
- Locate drill entry and exit pits at least 30 m from water bodies.

- Collect drill cuttings as they are generated, and place in a soil bin or bag for off-site disposal.
- Ensure drill depth is at an appropriate depth below the water body to reduce the risk of a 'frac-out'.
- Monitor water bodies for signs of surface disturbance.
- Complete geotechnical study to ensure site is suitable for this construction method.
- Implement a "Frac-Out" Contingency Plan in the event of a "frac-out", which will include but is not limited to the following:
 - 1. Immediately stop all work, including the recycling of drilling mud / lubricant.
 - 2. Isolate affected watercourse or area using a temporary dam and install by-pass pump system (if required) to maintain continuous flow downstream of the site;
 - 3. Insert rigid in-water/soil containment unit or underwater boom into the "frac-out" source area in order to contain any sediments and/or deleterious materials originating from the "frac-out".
 - 4. No captured material will be left on-site. The captured material should be extracted by vacuum truck, if available, or pumped into a containment unit or area for off-site disposal;
 - 5. Monitor "frac-out" for four hours to determine if the drilling mud congeals. If drilling mud congeals, take no other action that would potentially suspend sediments in the water column. If drilling mud does not congeal, maintain isolation/containment unit in place and continue pumping captured material to a containment unit or area until drilling mud congeals or stops flowing.
 - 6. Notify the Ministry of the Environment's (MOE) Spills Action Centre (1-800-268- 6060) of the "fracout" event and the response taken to contain the spill. This step should be completed during the 4 hour "frac-out" monitoring period.
 - 7. Engage a spill response team to contain and clean up excess drilling mud in the water.
 - 8. Monitor clean-up procedures to ensure they do not result in greater damage than leaving the mud in-place.
 - 9. If the spill affects an area that is vegetated, the area will be seeded and/or replanted using the same species to those in the adjacent area, or allowed to re-grow from existing vegetation. Re-vegetated areas will be monitored once per growing season for two years subsequent to "frac-out" to confirm re-vegetation is successful.
 - 10. Document post-cleanup conditions with photographs and prepare "frac-out" incident report describing time, place, actions taken to remediate "frac-out" and measures implemented to prevent recurrence. Provide incident report to MNR and MOE within 30 days of the incident.

Rehabilitation

- Re-vegetate and restore the turbine staging area following turbine installation with tiling (if desired by the owner).
- Restore and maintain vegetative buffers around water bodies including within the foundation footprint where possible.
- Restore & maintain vegetative buffers around water bodies including within the temporary construction areas.
- Add suitable stream substrates (e.g., gravel or rip rap) to stabilize sediment and provide cover.



Appendix C

Revised Figures for the Water Assessment and Water Body Report

