

## Appendix K VISUAL IMPACT ASSESSMENT



**Castle Rock Ridge Phase 2 /  
Riverview Wind Farm**

Visual Impact Assessment

May 11, 2018

Prepared for:

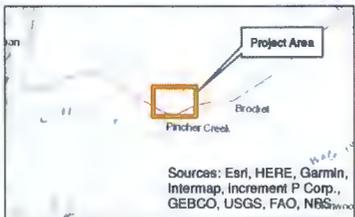
Enel Green Power

Prepared by:

Stantec Consulting Ltd.

## List of Figures

- Figure 1-0 - Location of Viewpoints
- Figure 1 – View from Viewpoint 0 – NE Sec 27 Twp 06 Rge 30 W4M – Looking Northwest
- Figure 2 – View from Viewpoint 0 – NE Sec 27 Twp 06 Rge 30 W4M – Looking Northeast
- Figure 3 – View from Viewpoint 1 – SW Sec 01 Twp 07 Rge 30 W4M – Looking Northwest
- Figure 4 – View from Viewpoint 1 – SW Sec 01 Twp 07 Rge 30 W4M – Looking Northeast
- Figure 5 – View from Viewpoint 1 – SW Sec 01 Twp 07 Rge 30 W4M – Looking East
- Figure 6 – View from Viewpoint 2 – NW Sec 31 Twp 06 Rge 29 W4M – Looking North
- Figure 7 – View from Viewpoint 3 – SW Sec 04 Twp 07 Rge 29 W4M – Looking North
- Figure 8 – View from Viewpoint 4 – NW Sec 04 Twp 07 Rge 29 W4M – Looking North
- Figure 9 – View from Viewpoint 5 – SW Sec 10 Twp 07 Rge 29 W4M – Looking West
- Figure 10 – View from Viewpoint 5 – SW Sec 10 Twp 07 Rge 29 W4M – Looking Northwest
- Figure 11 – View from Viewpoint 6 – SE Sec 15 Twp 07 Rge 29 W4M – Looking Southwest
- Figure 12 – View from Viewpoint 8 – NE Sec 17 Twp 07 Rge 29 W4M – Looking Northwest
- Figure 13 – View from Viewpoint 8 – NE Sec 17 Twp 07 Rge 29 W4M – Looking Southwest
- Figure 14 – View from Viewpoint 8 – NE Sec 17 Twp 07 Rge 29 W4M – Looking Southwest
- Figure 15 – View from Viewpoint 8 – NE Sec 17 Twp 07 Rge 29 W4M – Looking South
- Figure 16 – View from Viewpoint 9 – SE Sec 28 Twp 07 Rge 29 W4M – Looking Southwest
- Figure 17 – View from Viewpoint 9 – SE Sec 28 Twp 07 Rge 29 W4M – Looking Southwest
- Figure 18 – View from Viewpoint 10 – SW Sec 32 Twp 07 Rge 29 W4M – Looking Southwest
- Figure 19 – View from Viewpoint 10 – SW Sec 32 Twp 07 Rge 29 W4M – Looking South
- Figure 20 – View from Viewpoint 11 – NE Sec 36 Twp 07 Rge 29 W4M – Looking Southwest
- Figure 21 – View from Viewpoint 12 – SE Sec 26 Twp 07 Rge 01 W5M – Looking Southeast
- Figure 22 – View from Viewpoint 13 – NE Sec 26 Twp 07 Rge 01 W5M – Looking Southeast
- Figure 23 – View from Viewpoint 14 – SE Sec 35 Twp 07 Rge 01 W5M – Looking Southeast
- Figure 24 – View from Viewpoint 15 – SE Sec 15 Twp 07 Rge 01 W5M – Looking Northeast
- Figure 25 – View from Viewpoint 15 – SE Sec 15 Twp 07 Rge 01 W5M – Looking East
- Figure 26 – View from Viewpoint 16 – NE Sec 03 Twp 07 Rge 30 W4M – Looking North
- Figure 27 – View from Viewpoint 16 – NE Sec 03 Twp 07 Rge 30 W4M – Looking Northeast



- Legend**
- Photo Location
  - Receptors
  - Turbines - Riverview
  - Turbines - CRR Phase 2
  - Turbines - CRR Phase 1



Project Location: 118212101 REV A  
 M.D. of Pincher Creek Prepared by DM on 2018-05-03  
 Alberta Canada Technical Review by SE on 2018-05-03  
 Independent Review by JD on 2018-05-03

Client/Project: ENEL Green Power  
 CRR2/Riverview Wind Farm

Figure No. 1-0

Title: Viewpoint Location Map

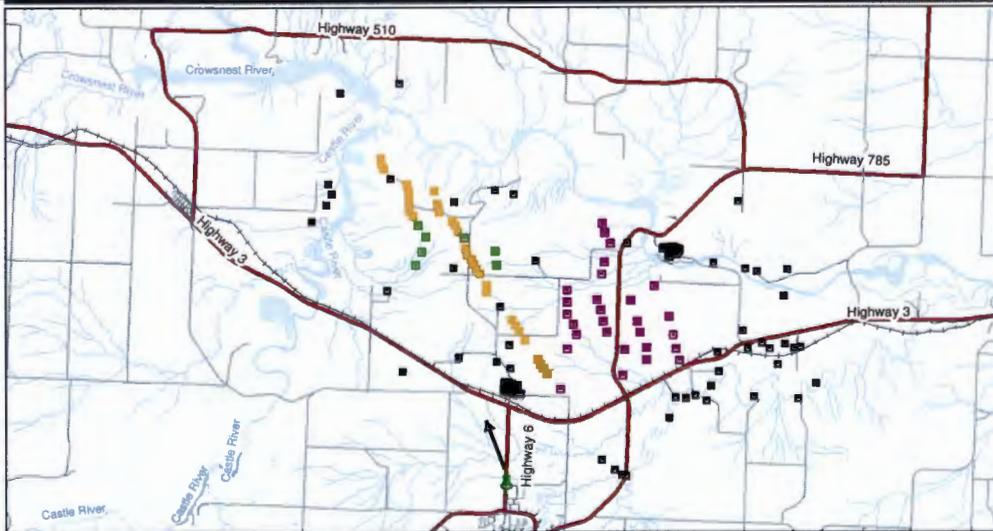
Notes  
 1. Coordinate System: NAD 1983 UTM Zone 12N



Photomontage Image



Original Photo



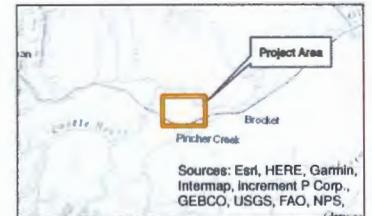
**Legend**

- Receptors
- Turbines - Riverview
- Turbines - CRR Phase 2
- Turbines - CRR Phase 1
- Major Road
- Minor Road
- Watercourse
- Waterbody
- 📍 Camera Location

1:130,000 (at original document size of 11x17)

**Notes**

1. Coordinate System: NAD 1983 UTM Zone 12N
2. Photo Taken: 2018/04/09



Project Location: 118212101 REVA  
 Prepared by DM on 2018-05-03  
 NAD of Pricher Creek  
 Alberta Canada  
 Technical Review by JK on 2018-05-03  
 Independent Review by JD on 2018-05-03

Client/Project

ENEL Green Power  
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Figure No.

1

Title

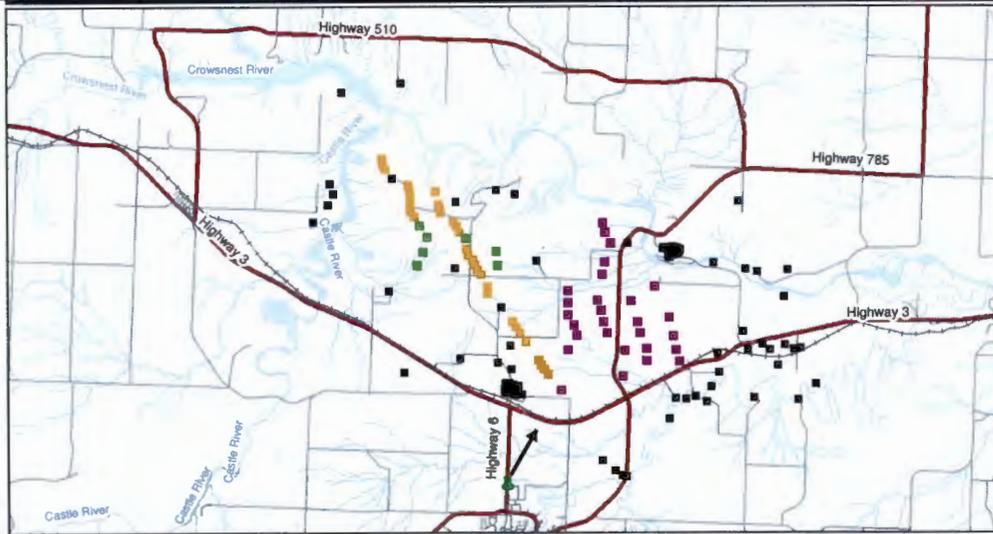
**View From Viewpoint 0**  
**NE Sec 27 Twp 06 Rge 30 W4M**  
**Looking Northwest**



Photomontage Image



Original Photo



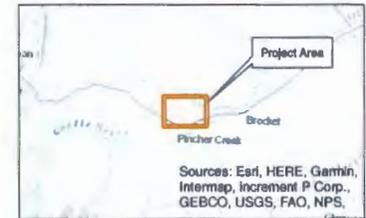
**Legend**

- Recaptors
- Turbines - Riverview
- Turbines - CRR Phase 2
- Turbines - CRR Phase 1
- Major Road
- Minor Road
- Watercourse
- Waterbody
- 📍 Camera Location

1:130,000 (at original document size of 11x17)

**Notes**

1. Coordinate System: NAD 1983 UTM Zone 12N
2. Photo Taken: 2018/04/09



Project Location: 118212101 REVA  
 Prepared by DM on 2018-03-03  
 M.D. of Pincher Creek  
 Alberta Canada  
 Technical Review by SC on 2018-03-03  
 Independent Review by JD on 2018-04-03

Client/Project

ENEL Green Power  
 CRR2/Riverview Wind Farm



Figure No.

2

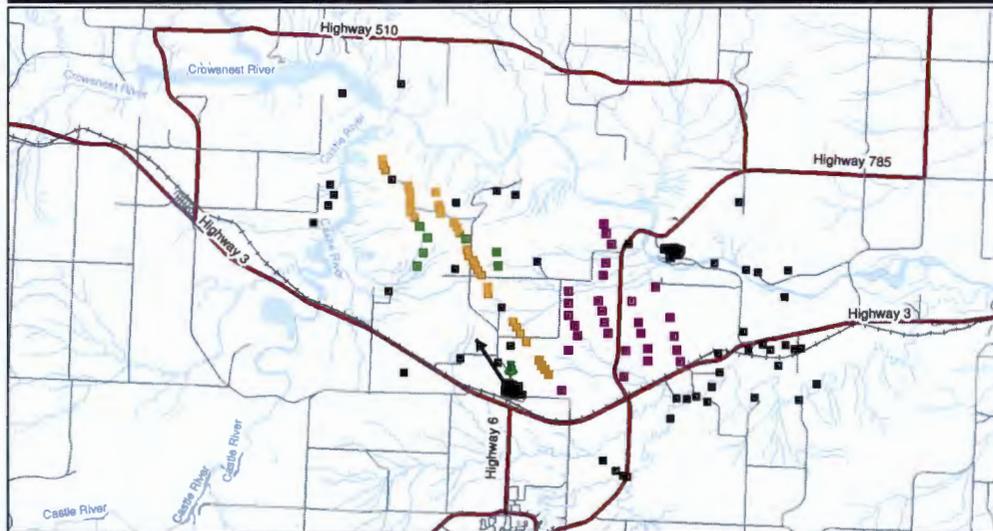
**View from Viewpoint 0**  
 NE Sec 27 Twp 06 Rge 30 W4M  
 Looking Northeast



Photomontage Image



Original Photo



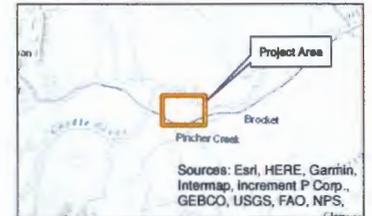
**Legend**

- Receptors
- Turbines - Riverview
- Turbines - CRR Phase 2
- Turbines - CRR Phase 1
- Major Road
- Minor Road
- Watercourse
- Waterbody
- 📍 Camera Location

1:130,000 (at original document size of 11x17)

**Notes**

1. Coordinate System: NAD 1983 UTM Zone 12N
2. Photo Taken: 2018/04/09



Project Location: 118212101 REVA  
 Prepared by D&I on 2018-04-03  
 M.D. of Fischer Creek  
 Alberta Canada  
 Technical Review by SC on 2018-06-03  
 Independent Review by JD on 2018-06-03

Client/Project

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 CRR2/Riverview Wind Farm



Figure No.

3

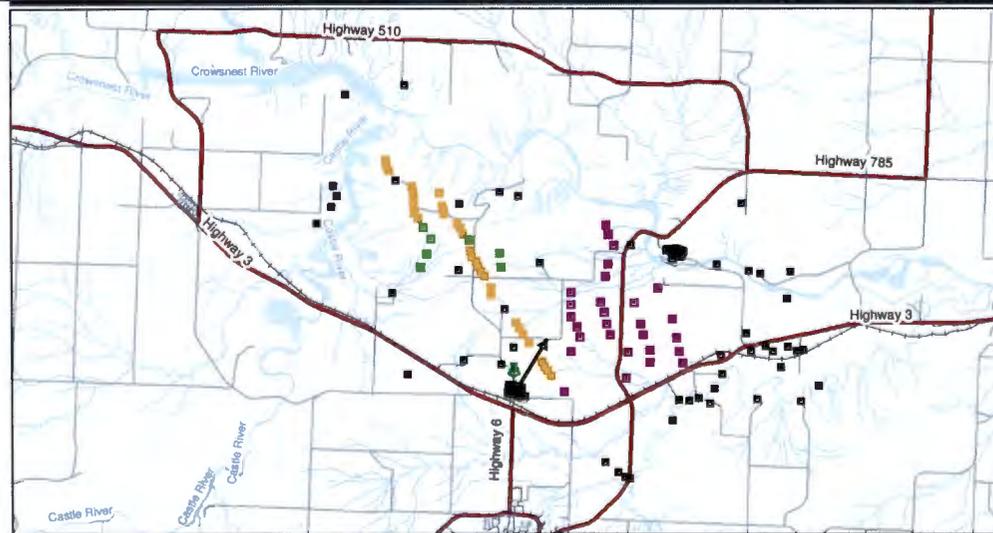
**View From Viewpoint 1**  
 SW Sec 01 Twp 07 Rge 30 W4M  
 Looking Northwest



Photomontage Image



Original Photo



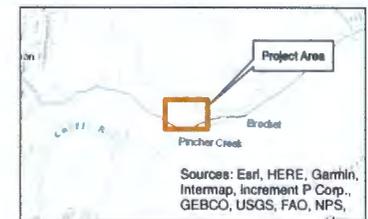
**Legend**

- Receptors
- Turbines - Riverview
- Turbines - CRR Phase 2
- Turbines - CRR Phase 1
- Major Road
- Minor Road
- Watercourse
- Waterbody
- 📍 Camera Location

1:150,000 (at original document size of 11x17)

**Notes**

1. Coordinate System: NAD 1983 UTM Zone 12N
2. Photo Taken: 2018/04/09



Project Location: 116212101 REVA  
 M.D. of Pincher Creek Prepared by D&A on 2018-05-03  
 Alberta, Canada Technical Review by SE on 2018-05-03  
 Independent Review by JD on 2018-05-03

Client/Project

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 CRR2/Riverview Wind Farm



Figure No.

4

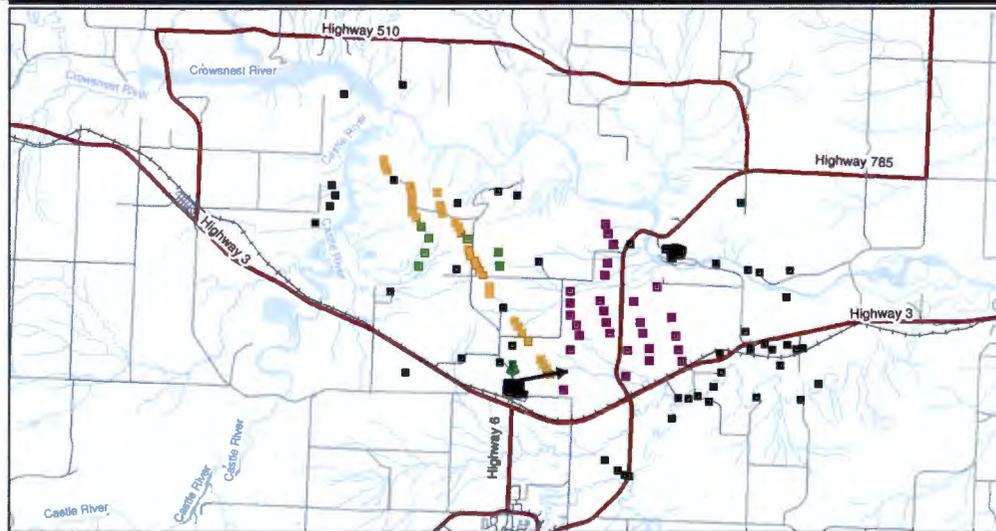
**View from Viewpoint 1**  
**SW Sec 01 Twp 07 Rge 30 W4M**  
**Looking Northeast**



Photomontage Image



Original Photo



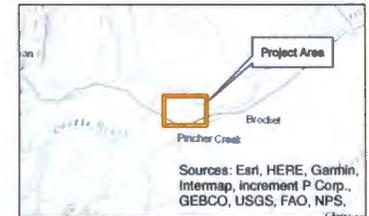
**Legend**

- Receptors
- Turbines - Riverview
- Turbines - CRR Phase 2
- Turbines - CRR Phase 1
- Major Road
- Minor Road
- Watercourse
- Waterbody
- 📍 Camera Location

1:130,000 (at original document size of 11x17)

**Notes**

1. Coordinate System: NAD 1983 UTM Zone 12N
2. Photo Taken: 2018/04/09



Project Location: M.D. of Pincher Creek, Alberta, Canada  
 118212101 REVA  
 Prepared by DM on 2018-05-03  
 Technical Review by ST on 2018-05-03  
 Independent Review by JD on 2018-05-03

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 CRR2/Riverview Wind Farm



Figure No.

5

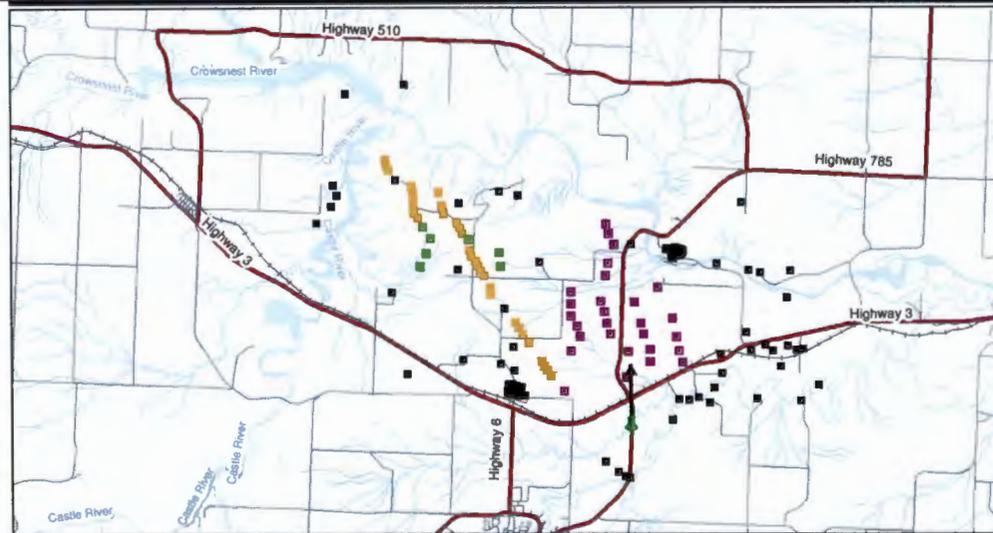
**View from Viewpoint 1**  
 SW Sec 01 Twp 07 Rge 30 W4M  
 Looking East



Photomontage Image



Original Photo



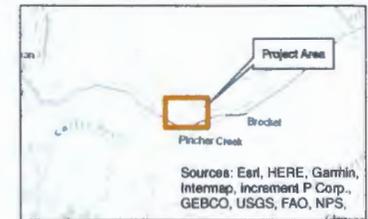
**Legend**

- Receptors
- Turbines - Riverview
- Turbines - CRR Phase 2
- Turbines - CRR Phase 1
- Major Road
- Minor Road
- Watercourse
- Waterbody
- 📍 Camera Location

1:130,000 (at original document size of 11x17)

**Notes**

1. Coordinate System: NAD 1983 UTM Zone 12N
2. Photo Taken: 2018/04/09



Project Location: 118212101 REVA  
 Mtd. of Picher Creek Prepared by DM on 2018-05-03  
 Alberta Canada Technical Review by SK on 2018-05-03  
 Independent Review by JD on 2018-05-03

Client/Project

ENEL Green Power  
 CRR2/Riverview Wind Farm



Figure No.

6

**View From Viewpoint 2**  
 NW Sec 31 Twp 06 Rge 29 W4M  
 Looking North

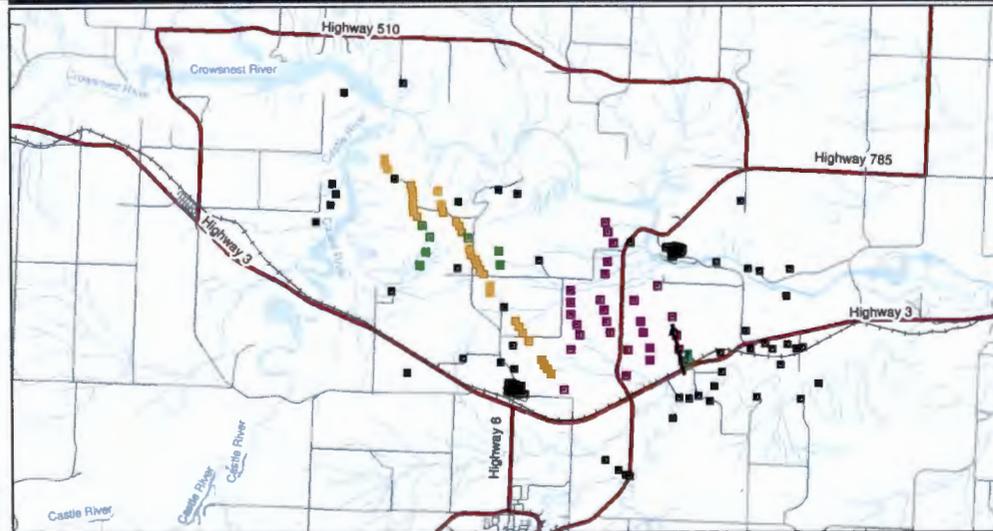




Photomontage Image



Original Photo



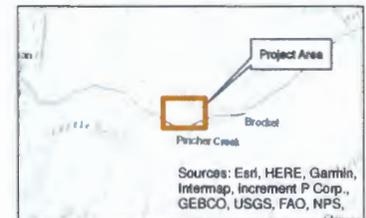
**Legend**

- Receptors
- Turbines - Riverview
- Turbines - CRR Phase 2
- Turbines - CRR Phase 1
- Major Road
- Minor Road
- Watercourse
- Waterbody
- 📍 Camera Location

1:130,000 (at original document size of 11x17)

**Notes**

1. Coordinate System: NAD 1983 UTM Zone 12N
2. Photo Taken: 2018/04/09



Project Location: 118212101 REVA  
 M.D. of Pincher Creek Prepared by DM on 2018-05-03  
 Alberta Canada Technical Review by SK on 2018-05-03  
 Independent Review by JD on 2018-05-03

Client/Project

ENEL Green Power  
 CRR2/Riverview Wind Farm



Figure No.

8

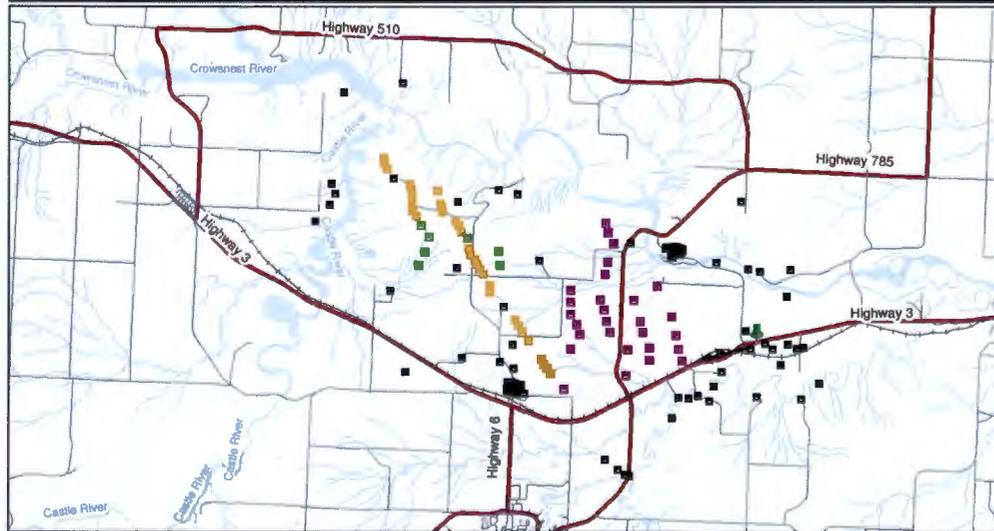
**View From Viewpoint 4**  
 NW Sec 04 Twp 07 Rge 29 W4M  
 Looking North



Photomontage Image



Original Photo



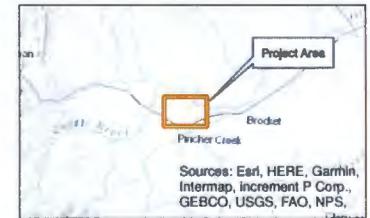
**Legend**

- Receptors
- Turbines - Riverview
- Turbines - CRR Phase 2
- Turbines - CRR Phase 1
- Major Road
- Minor Road
- Watercourse
- Waterbody
- 📍 Camera Location

1:130,000 (at original document size of 11x17)

**Notes**

1. Coordinate System: NAD 1983 UTM Zone 12N
2. Photo Taken: 2018/04/09



Project Location: 116212101 REVA  
 MAD, of Pincher Creek  
 Prepared by SIA on 2018-04-09  
 Alberta, Canada  
 Technical Reviewer by SE on 2018-08-09  
 Independent Reviewer by JD on 2018-08-09

Client/Project:  
 ENEL Green Power  
 CRR2/Riverview Wind Farm



Figure No.  
 9

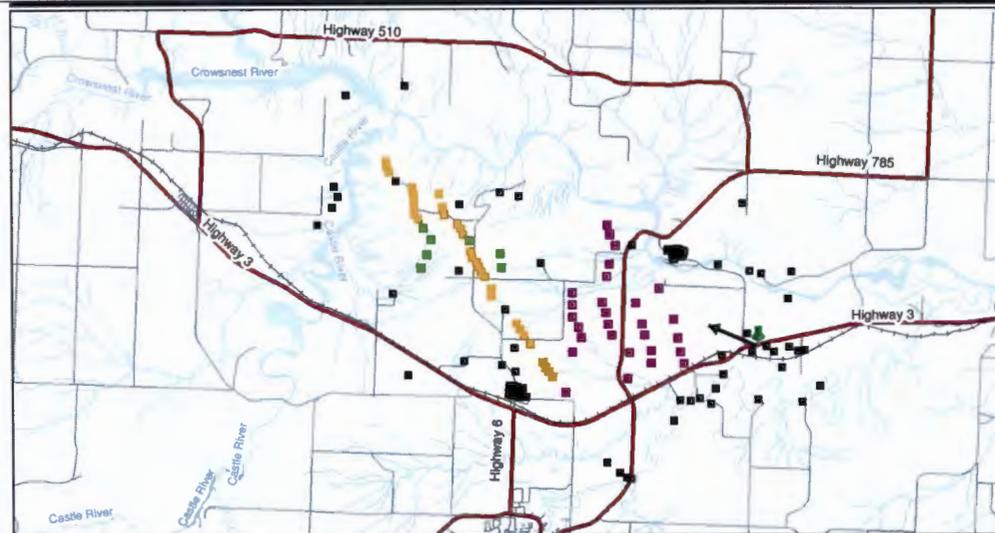
**View from Viewpoint 5**  
 SW Sec 10 Twp 07 Rge 29 W4M  
 Looking West



Photomontage Image



Original Photo



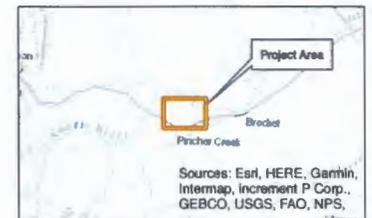
**Legend**

- Receptors
- Turbines - Riverview
- Turbines - CRR Phase 2
- Turbines - CRR Phase 1
- Major Road
- Minor Road
- Watercourse
- Waterbody
- ✚ Camera Location

1:130,000 (at original document size of 11x17)

**Notes**

1. Coordinate System: NAD 1983 UTM Zone 12N
2. Photo Taken: 2018/04/09



Project Location: 118212101 REVA  
 M.D. of Pincher Creek Prepared by DM on 2018-05-03  
 Alberta Canada Technical Review by JK on 2018-05-03  
 Independent Review by JD on 2018-05-03

Client/Project

ENEL Green Power  
 CRR2/Riverview Wind Farm



Figure No.

10

Title

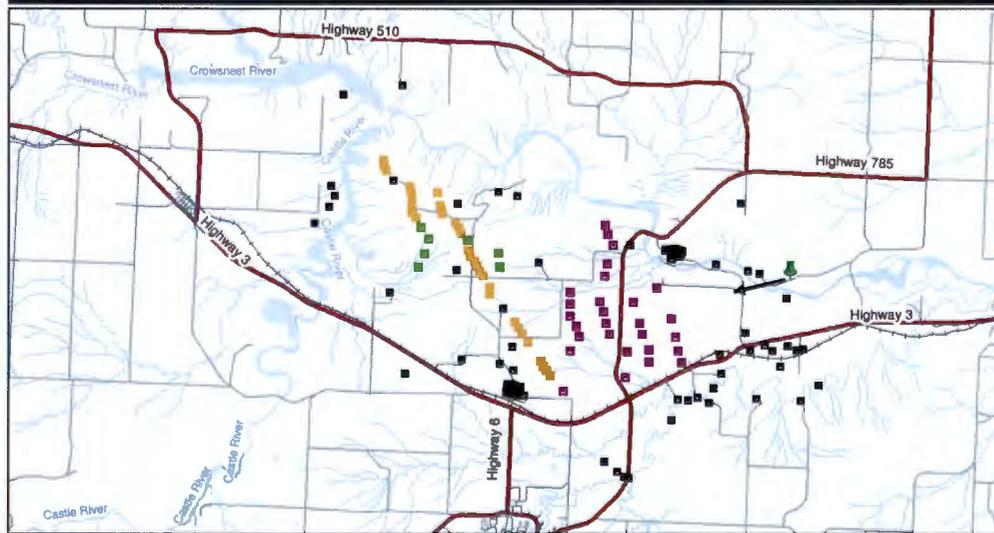
**View From Viewpoint 5**  
**SW Sec 10 Twp 07 Rge 29 W4M**  
**Looking Northwest**



Photomontage Image



Original Photo



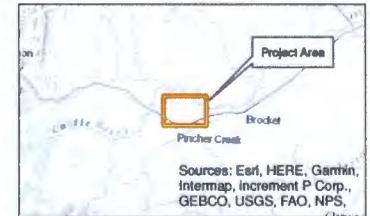
**Legend**

- Receptors
- Turbines - Riverview
- Turbines - CRR Phase 2
- Turbines - CRR Phase 1
- Major Road
- Minor Road
- Watercourse
- Waterbody
- ✚ Camera Location

1:130,000 (at original document size of 11x17)

**Notes**

1. Coordinate System: NAD 1983 UTM Zone 12N
2. Photo Taken: 2018/04/09



Project Location  
 A.D. of Pincher Creek  
 Alberta Canada  
 118212101 REVA  
 Prepared by DM on 2018-05-03  
 Technical Review by SK on 2018-05-03  
 Independent Review by JD on 2018-05-03

Client/Project  
 ENEL Green Power  
 CRR2/Riverview Wind Farm



Figure No.

11

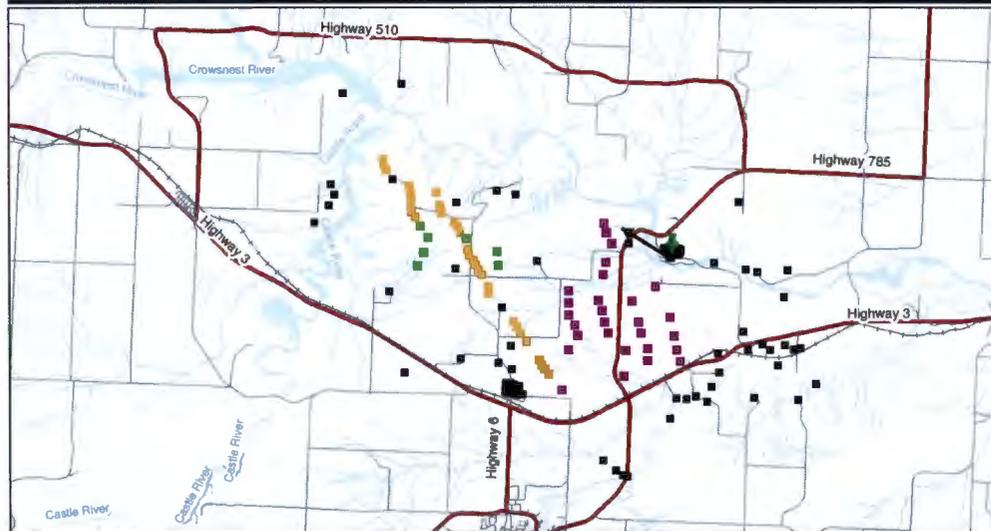
**View from Viewpoint 6**  
**SE Sec 15 Twp 07 Rge 29 W4M**  
**Looking Southwest**



Photomontage Image



Original Photo



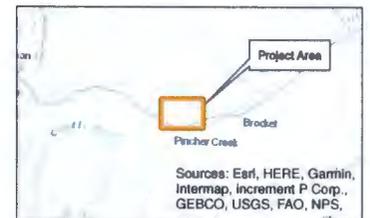
**Legend**

- Receptors
- Turbines - Riverview
- Turbines - CRR Phase 2
- Turbines - CRR Phase 1
- Major Road
- Minor Road
- Watercourse
- Waterbody
- 📍 Camera Location

1:130,000 (at original document size of 11x17)

**Notes**

1. Coordinate System: NAD 1983 UTM Zone 12N
2. Photo Taken: 2018/04/09



Project Location: 118212101 REVA  
 AD, of Pincher Creek Prepared by D14 on 2018-05-03  
 Alberta Canada Technical Review by SC on 2018-05-03  
 Independent Review by JD on 2018-05-03

Client/Project:

ENEL Green Power  
 CRR2/Riverview Wind Farm



Figure No.

12

Title

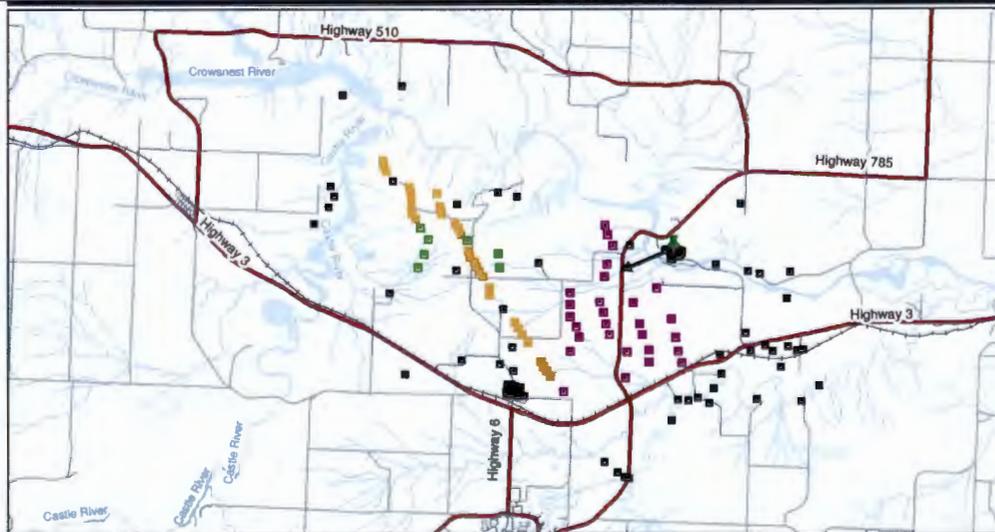
**View From Viewpoint 8**  
**NE Sec 17 Twp 07 Rge 29 W4M**  
**Looking Northwest**



Photomontage Image



Original Photo



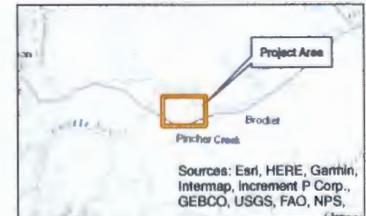
**Legend**

- Receptors
- Turbines - Riverview
- Turbines - CRR Phase 2
- Turbines - CRR Phase 1
- Major Road
- Minor Road
- Watercourse
- Waterbody
- 📍 Camera Location

1:130,000 (at original document size of 11x17)

**Notes**

1. Coordinate System: NAD 1983 UTM Zone 12N
2. Photo Taken: 2018/04/09



Project Location: 118212101 REVA  
 M.D. of Pincher Creek Prepared by DM on 2018-05-03  
 Alberta Canada Technical Review by JK on 2018-05-03  
 Independent Review by JB on 2018-05-03

Client/Project

ENEL Green Power  
 CRR2/Riverview Wind Farm



Figure No.

13

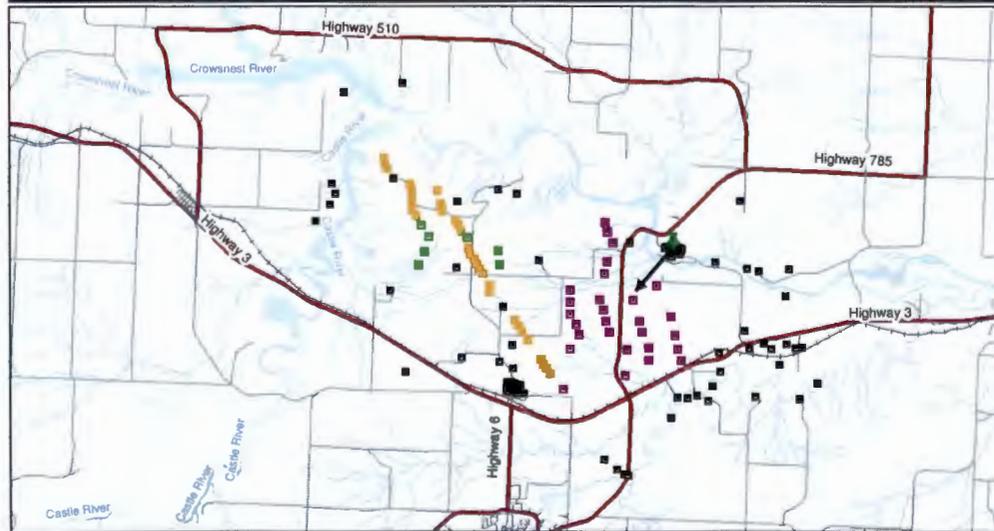
**View from Viewpoint 8**  
**NE Sec 17 Twp 07 Rge 29 W4M**  
**Looking Southwest**



Photomontage Image



Original Photo



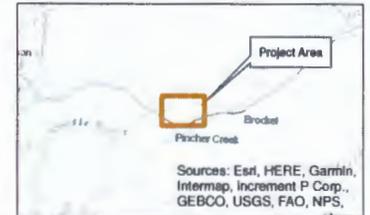
**Legend**

- Receptors
- Turbines - Riverview
- Turbines - CRR Phase 2
- Turbines - CRR Phase 1
- Major Road
- Minor Road
- Watercourse
- Waterbody
- ⊕ Camera Location

1:130,000 (at original document size of 11x17)

**Notes**

1. Coordinate System: NAD 1983 UTM Zone 12N
2. Photo Taken: 2018/04/09



Project Location: M.D. of Pincher Creek, Alberta, Canada  
 118212101 REV A  
 Prepared by DM on 2018-04-03  
 Technical Review by SK on 2018-04-03  
 Independent Review by JD on 2018-04-03

Client/Project

ENEL Green Power  
 CRR2/Riverview Wind Farm



Figure No.

14

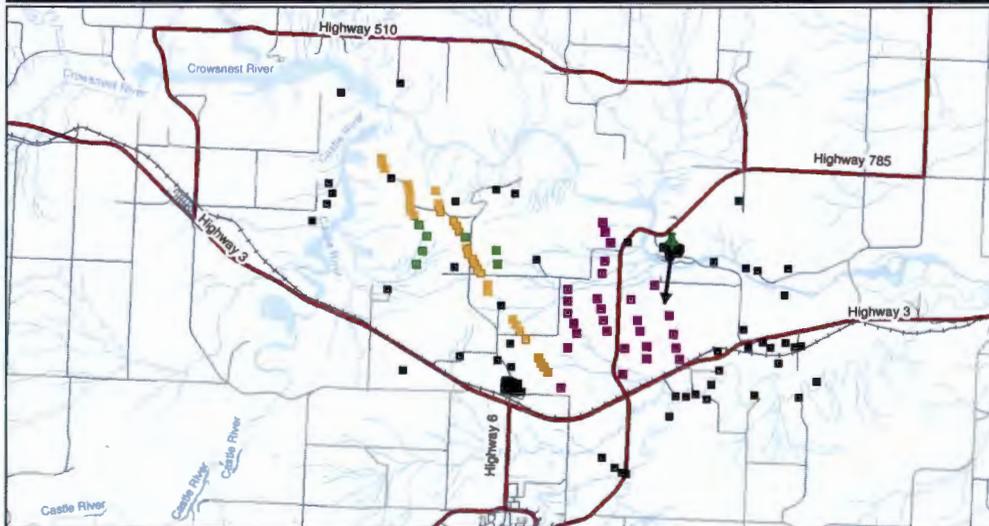
**View from Viewpoint 8**  
**NE Sec 17 Twp 07 Rge 29 W4M**  
**Looking Southwest**



Photomontage Image



Original Photo



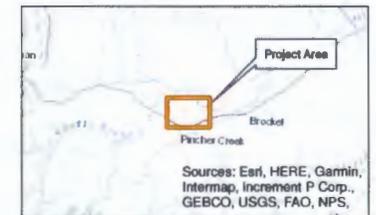
**Legend**

- Receptors
- Turbines - Riverview
- Turbines - CRR Phase 2
- Turbines - CRR Phase 1
- Major Road
- Minor Road
- Watercourse
- Waterbody
- 📍 Camera Location

1:130,000 (at original document size of 11x17)

**Notes**

1. Coordinate System: NAD 1983 UTM Zone 12N
2. Photo Taken: 2018/04/09



Project Location: 118212101 REVA  
 M.D. of Pincher Creek  
 Alberta Canada  
 Prepared by DM on 2018-05-03  
 Technical Review by JK on 2018-05-03  
 Independent Review by JD on 2018-05-03

Client/Project

ENEL Green Power  
 CRR2/Riverview Wind Farm



Figure No.

15

**View From Viewpoint 8**  
 NE Sec 17 Twp 07 Rge 29 W4M  
 Looking South

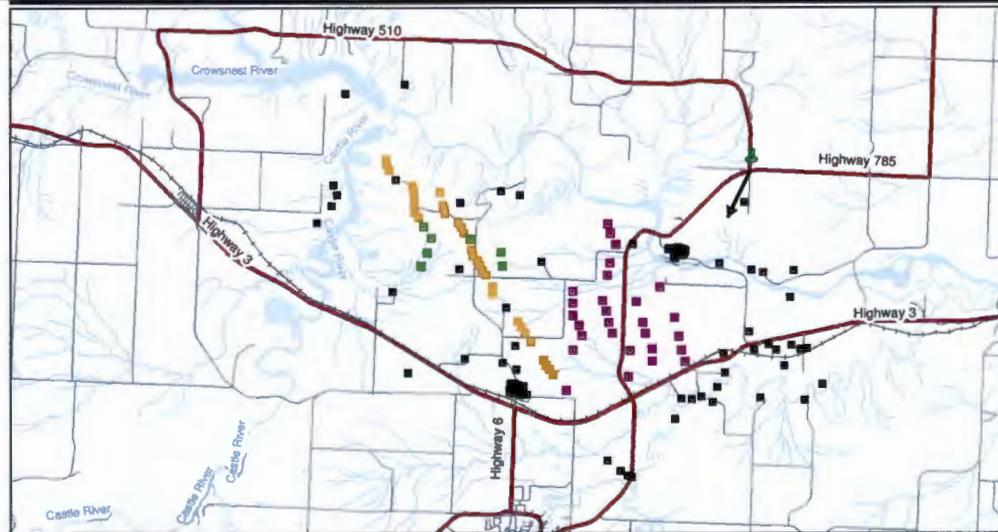




Photomontage Image



Original Photo



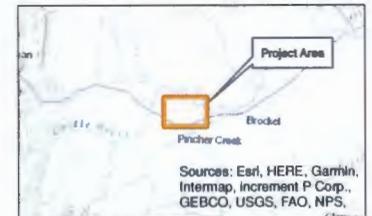
**Legend**

- Receptors
- Turbines - Riverview
- Turbines - CRR Phase 2
- Turbines - CRR Phase 1
- Major Road
- Minor Road
- Watercourse
- Waterbody
- 📍 Camera Location

1:130,000 (at original document size of 11x17)

**Notes**

1. Coordinate System: NAD 1983 UTM Zone 12N
2. Photo Taken: 2018/04/09



Project Location: 118212101 REVA  
 M.D. of Picher Creek Prepared by DM on 2018-05-03  
 Alberta Canada Technical Review by SE on 2018-05-03  
 Independent Review by JD on 2018-05-03

Client/Project

ENEL Green Power  
 CRR2/Riverview Wind Farm



Figure No.

17

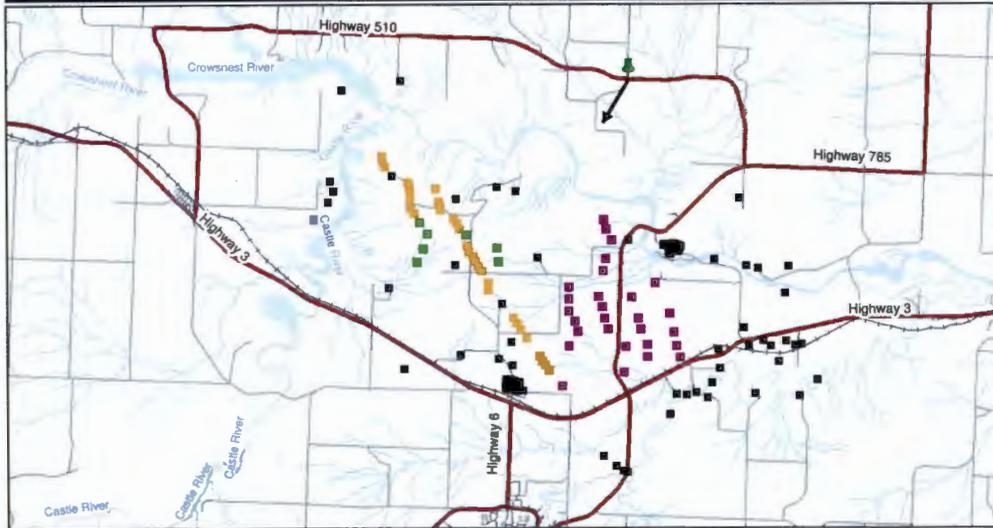
**Title**  
 View From Viewpoint 9  
 SE Sec 28 Twp 07 Rge 29 W4M  
 Looking Southwest



Photomontage Image



Original Photo



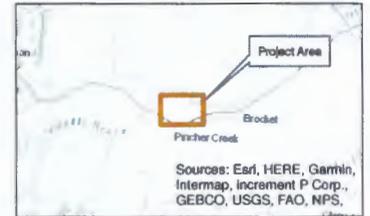
**Legend**

- Receptors
- Turbines - Riverview
- Turbines - CRR Phase 2
- Turbines - CRR Phase 1
- Major Road
- Minor Road
- Watercourse
- Waterbody
- 📍 Camera Location

1:130,000 (at original document size of 11x17)

**Notes**

1. Coordinate System: NAD 1983 UTM Zone 12N
2. Photo Taken: 2018/04/09



Project Location: 118212101 REVA  
 M.D. of Pritchard Creek Prepared by DMA on 2018-05-03  
 Alberta Canada Technical Review by JK on 2018-05-03  
 Independent Review by AD on 2018-05-03

Client/Project

ENEL Green Power  
 CRR2/Riverview Wind Farm



Figure No.

18

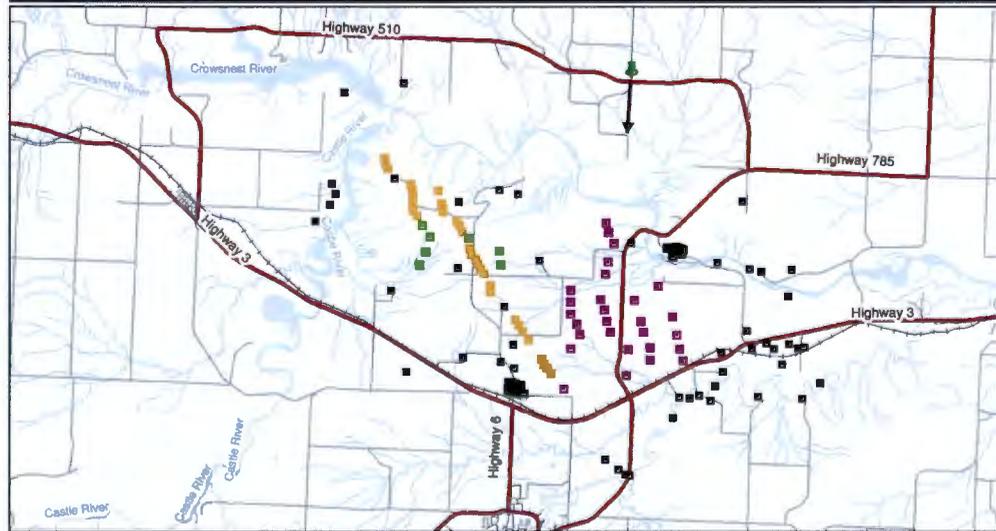
View from Viewpoint 10  
 SW Sec 32 Twp 07 Rge 29 W4M  
 Looking Southwest



Photomontage Image



Original Photo



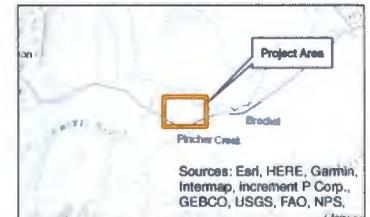
**Legend**

- Receptors
- Turbines - Riverview
- Turbines - CRR Phase 2
- Turbines - CRR Phase 1
- Major Road
- Minor Road
- Watercourse
- Waterbody
- 📍 Camera Location

1:130,000 (at original document size of 11x17)

**Notes**

1. Coordinate System: NAD 1983 UTM Zone 12N
2. Photo Taken: 2018/04/09



Project Location: A.D. of Pincher Creek, Alberta Canada  
 Prepared by SK on 2018-02-03  
 Technical Review by SK on 2018-05-03  
 Independent Review by JD on 2018-05-03

Client/Project: ENEL Green Power CRR2/Riverview Wind Farm



Figure No. 19

Title

**View from Viewpoint 10**  
**SW Sec 32 Twp 07 Rge 29 W4M**  
**Looking South**

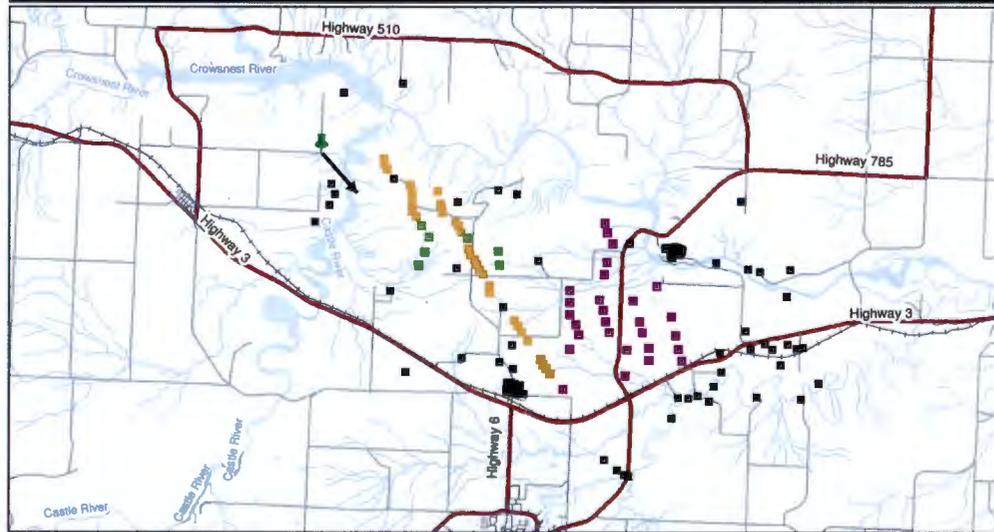




Photomontage Image



Original Photo



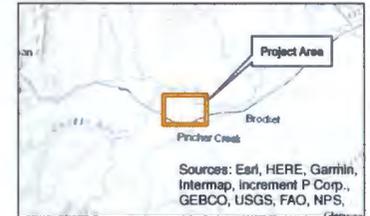
**Legend**

- Receptors
- Turbines - Riverview
- Turbines - CRR Phase 2
- Turbines - CRR Phase 1
- Major Road
- Minor Road
- Watercourse
- Waterbody
- 📍 Camera Location

1:150,000 (at original document size of 11x17)

**Notes**

1. Coordinate System: NAD 1983 UTM Zone 12N
2. Photo Taken: 2018/04/09



Project Location: A.D. of Pincher Creek, Alberta, Canada  
 118212101 REVA  
 Prepared by DSA on 2018-05-03  
 Technical Review by SK on 2018-05-03  
 Independent Review by JD on 2018-05-03

Client/Project

ENEL Green Power  
 CRR2/Riverview Wind Farm



Figure No.

21

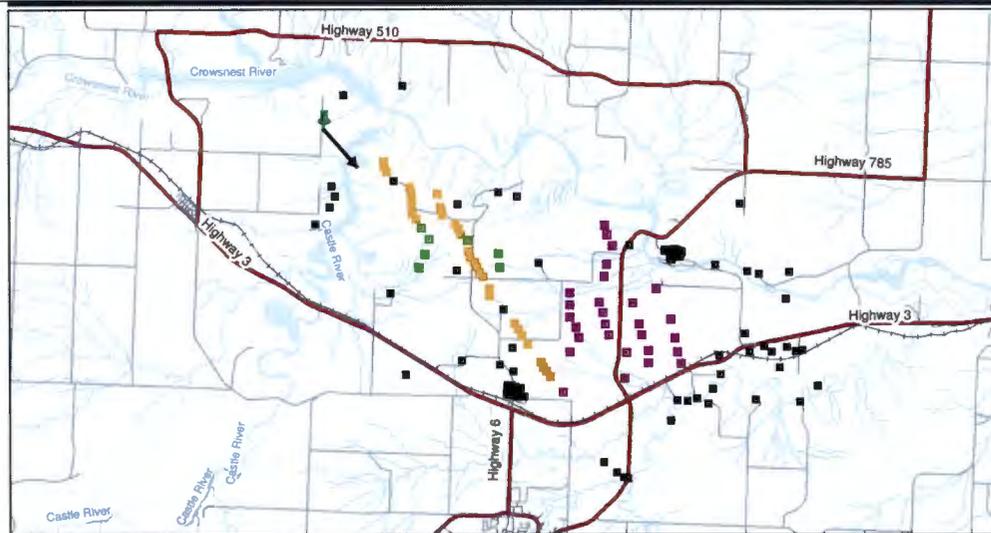
**View From Viewpoint 12**  
**SE Sec 26 Twp 07 Rge 01 W5M**  
**Looking Southeast**



Photomontage Image



Original Photo



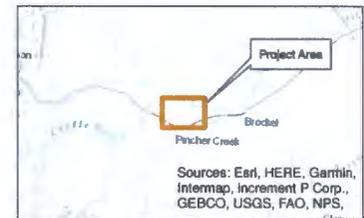
**Legend**

- Receptors
- Turbines - Riverview
- Turbines - CRR Phase 2
- Turbines - CRR Phase 1
- Major Road
- Minor Road
- Watercourse
- Waterbody
- 📍 Camera Location

1:150,000 (at original document size of 11x17)

**Notes**

1. Coordinate System: NAD 1983 UTM Zone 12N
2. Photo Taken: 2018/04/07



Project Location: 118212101 REVA  
 M.D. of Percher County  
 Alberta Canada  
 Prepared by D&I on 2018-08-02  
 Technical Review by BC on 2018-08-03  
 Independent Review by JD on 2018-08-03

Client/Project

ENEL Green Power  
 CRR2/Riverview Wind Farm



Figure No.

22

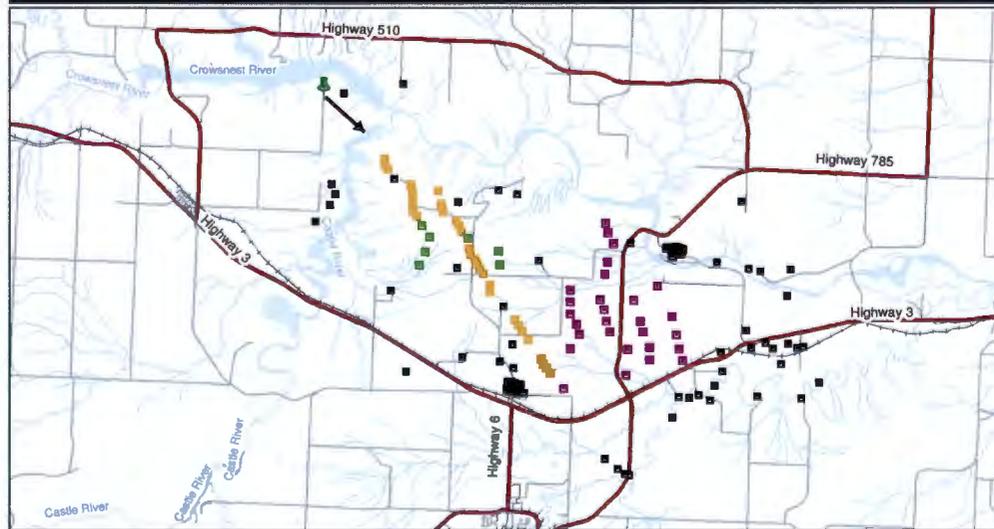
**View From Viewpoint 13**  
**NE Sec 26 Twp 07 Rge 01 W5M**  
**Looking Southeast**



Photomontage Image



Original Photo



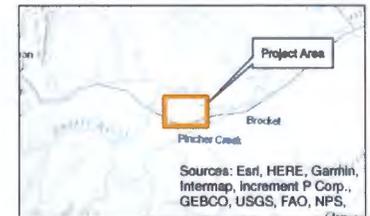
**Legend**

- Receptors
- Turbines - Riverview
- Turbines - CRR Phase 2
- Turbines - CRR Phase 1
- Major Road
- Minor Road
- Watercourse
- Waterbody
- 📍 Camera Location

1:130,000 (at original document size of 11x17)

**Notes**

1. Coordinate System: NAD 1983 UTM Zone 12N
2. Photo Taken: 2018/04/09



Project Location: M.D. of Pincher Creek, Alberta, Canada  
 118212101 REVA  
 Prepared by GM on 2018-05-03  
 Technical Review by SK on 2018-05-03  
 Independent Review by JD on 2018-05-03

Client/Project: ENEL Green Power CRR2/Riverview Wind Farm



Figure No. 23

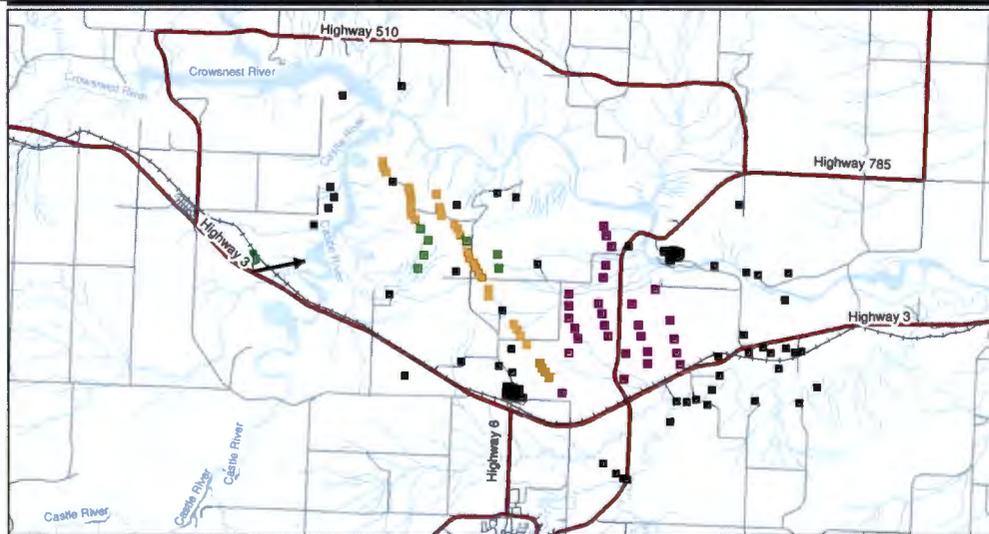
**View from Viewpoint 14**  
**SE Sec 35 Twp 07 Rge 01 W5M**  
**Looking Southeast**



Photomontage Image



Original Photo



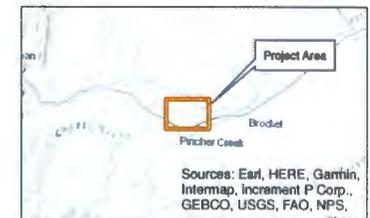
**Legend**

- Receptors
- Turbines - Riverview
- Turbines - CRR Phase 2
- Turbines - CRR Phase 1
- Major Road
- Minor Road
- Watercourse
- Waterbody
- 📍 Camera Location

1:130,000 (at original document size of 11x17)

**Notes**

1. Coordinate System: NAD 1983 UTM Zone 12N
2. Photo Taken: 2018/04/09



Project Location: 118212101 REVA  
 RD, of Pincher Creek Prepared by SIA on 2018-05-03  
 Alberta Canada Technical Review by ST on 2018-05-03  
 Independent Review by JD on 2018-05-03

Client/Project

ENEL Green Power  
 CRR2/Riverview Wind Farm



Figure No.

24

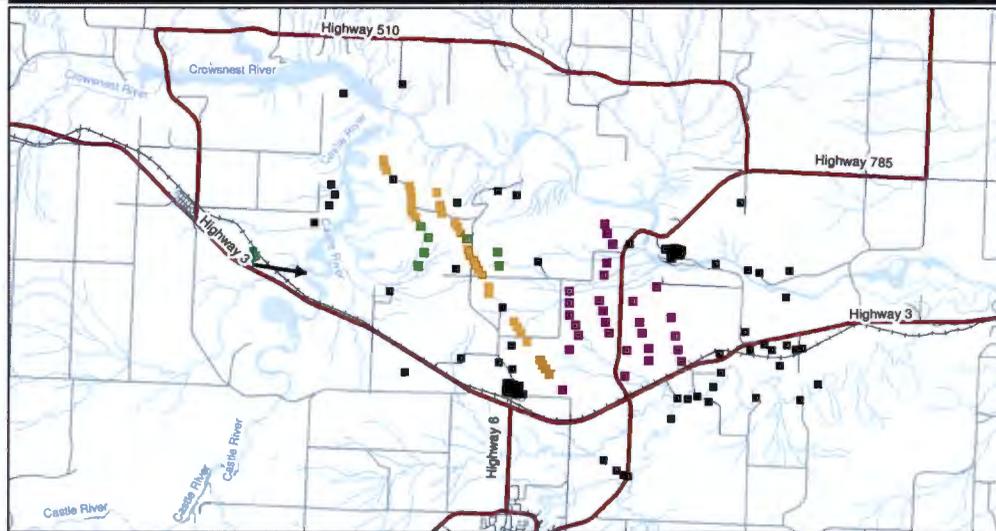
**View From Viewpoint 15**  
**SE Sec 15 Twp 07 Rge 01 W5M**  
**Looking Northeast**



Photomontage Image



Original Photo



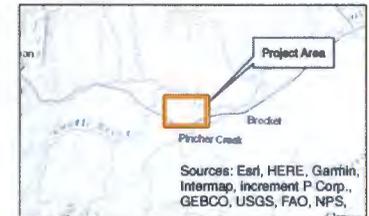
**Legend**

- Receptors
- Turbines - Riverview
- Turbines - CRR Phase 2
- Turbines - CRR Phase 1
- Major Road
- Minor Road
- Watercourse
- Waterbody
- ➔ Camera Location

1:130,000 (at original document size of 11x17)

**Notes**

1. Coordinate System: NAD 1983 UTM Zone 12N
2. Photo Taken: 2018/04/09



Project Location  
 N.D. of Pincher Creek  
 Alberta Canada

118212101 REVA  
 Prepared by DAI on 2018-05-03  
 Technical Review by SK on 2018-05-03  
 Independent Review by JD on 2018-05-03

Client/Project  
 ENEL Green Power  
 CRR2/Riverview Wind Farm



Figure No.

**25**

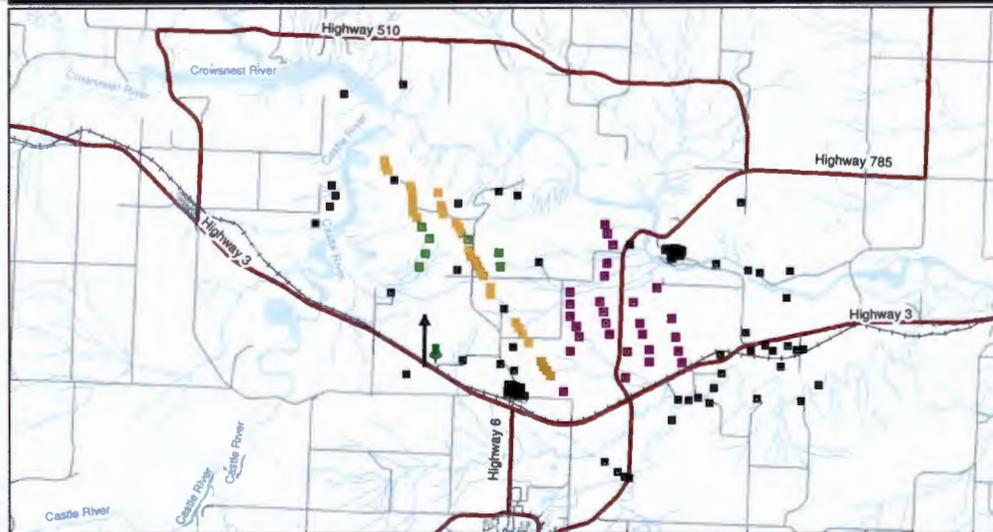
**View From Viewpoint 15**  
**SE Sec 15 Twp 07 Rge 01 W5M**  
**Looking East**



Photomontage Image



Original Photo



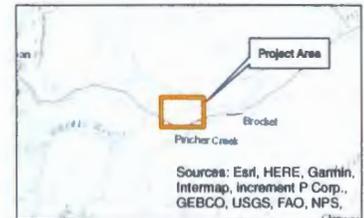
**Legend**

- Receptors
- Turbines - Riverview
- Turbines - CRR Phase 2
- Turbines - CRR Phase 1
- Major Road
- Minor Road
- Watercourse
- Waterbody
- 📍 Camera Location

1:130,000 (at original document size of 11x17)

**Notes**

1. Coordinate System: NAD 1983 UTM Zone 12N
2. Photo Taken: 2018/04/09



Project Location: 118212101 REVA  
 M.D. of Pincher Creek Prepared by DM on 2018-05-03  
 Alberta Canada Technical Review by JK on 2018-06-03  
 Independent Review by JD on 2018-06-03

Client/Project

ENEL Green Power  
 CRR2/Riverview Wind Farm



Figure No.

26

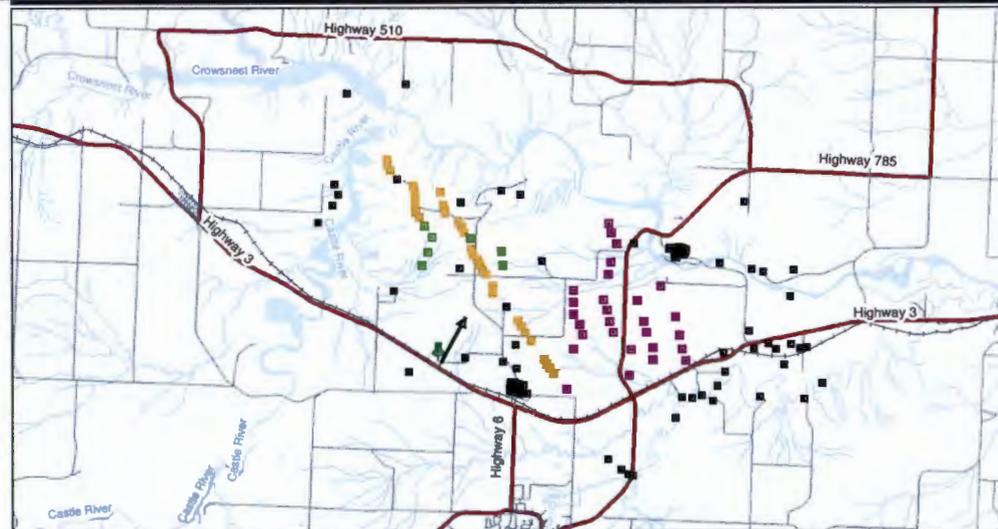
View From Viewpoint 16  
 NE Sec 03 Twp 07 Rge 30 W4M  
 Looking North



Photomontage Image



Original Photo



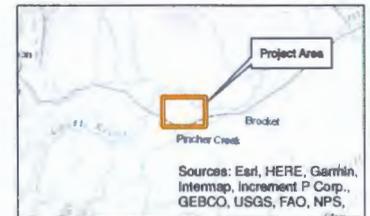
**Legend**

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- Turbines - CRR Phase 2
- Turbines - CRR Phase 1
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- Waterbody
- ↑ Camera Location

1:130,000 (at original document size of 11x17)

**Notes**

1. Coordinate System: NAD 1983 UTM Zone 12N
2. Photo Taken: 2018/04/09



Project Location: 118212101 REVA  
 M.D. of Pricher Creek Prepared by DM on 2018-05-03  
 Alberta Canada Technical Review by JC on 2018-05-03  
 Independent Review by JD on 2018-05-03

Client/Project

ENEL Green Power  
 CRR2/Riverview Wind Farm



Figure No.

27

View From Viewpoint 16  
 NE Sec 03 Twp 07 Rge 30 W4M  
 Looking Northeast

## Appendix L PUBLIC CONSULTATION



Pincher Creek, L.P.  
by its general partner Enel Alberta Wind Inc.  
(subsidiary of Enel Green Power North America, Inc.)

1110–1255 Boulevard Robert Bourassa  
Montréal, Québec, H3B 3W7  
www.enelgreenpower.com

May 25, 2018

## **Castle Rock Ridge Phase II Wind Power Project**

Dear Stakeholder:

My name is Victor Engel from Enel Green Power North America, Inc. and I am the Project Manager for the proposed Castle Rock Ridge Phase II Wind Power Project (the Project). As part of our Participant Involvement Program, you have been identified as a resident, landowner, or occupant within two kilometres of the Project boundary, and you may have an interest in the Project. We look forward to starting a dialogue with you, and we have provided details about the Project in the enclosed information package.

### **Project Details**

The Project is owned by Pincher Creek, L.P., through its general partner, Enel Alberta Wind Inc. You may be more familiar with our parent company; Enel Green Power North America, Inc. (EGP), the owner of Enel Alberta Wind Inc. This proposed Project is the second phase of the Castle Rock Ridge I Wind Farm, which has been operational since May 2012. This Project will include seven Vestas V136 wind turbines, each rated at 4.2 megawatts (MW) for a total capacity of 29.4 MW. The Project will use the existing Castle Rock Ridge project collector substation, and EGP has sited the turbines within the existing project lands.

Accompanying this letter are several documents with further information about the Project:

- The Project-Specific Information Package has an overview of the Castle Rock Ridge Phase II Wind Power Project, Project details, and other consultation information. We have also provided information on Project effects such as shadow flicker, noise impact, and visual simulations.
- The Project Map shows the Project boundary and site plan with seven proposed turbine locations, the proposed access roads, the proposed laydown area, the existing Castle Rock Ridge I Wind Farm, and the existing substation location. This map also shows the noise and shadow flicker impacts.
- The Visual Simulation shows the wind farm representation at two locations near the Project.
- The Alberta Utilities Commission Brochure, *Public involvement in a proposed utility development*, outlines your rights and options for participating in the proceedings.

### **Alberta Electricity System Operator Renewable Electricity Program Round 1 Award**

The Alberta Electricity System Operator's Renewable Electricity Program launched a tender for electricity that was awarded in December 2017. We are thrilled to share that EGP has been awarded a 20-year Renewable Electricity Support Agreement for this Project. This award is a major milestone for our company, and we look forward to continuing to grow here in Alberta and to investing in the Canadian economy.



## **Contact Us**

We are committed to engaging with the community, landowners, and local government — both as we move toward construction and throughout the Project's life. We welcome your feedback!

If you have any questions or concerns regarding Castle Rock Ridge Phase II, please feel free to contact me at **1-855-300-3050** or **CRR2@enel.com**.

### **Victor A. Engel**

Project Manager - EGP Castle Rock Ridge  
Phase II Wind Power Project

Pincher Creek, L.P., by its general partner

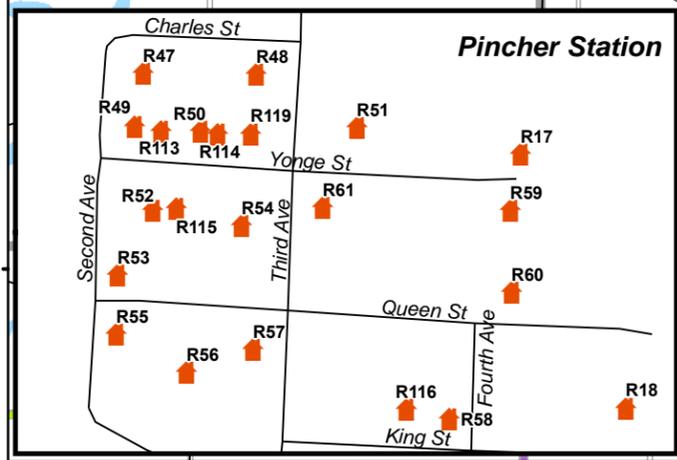
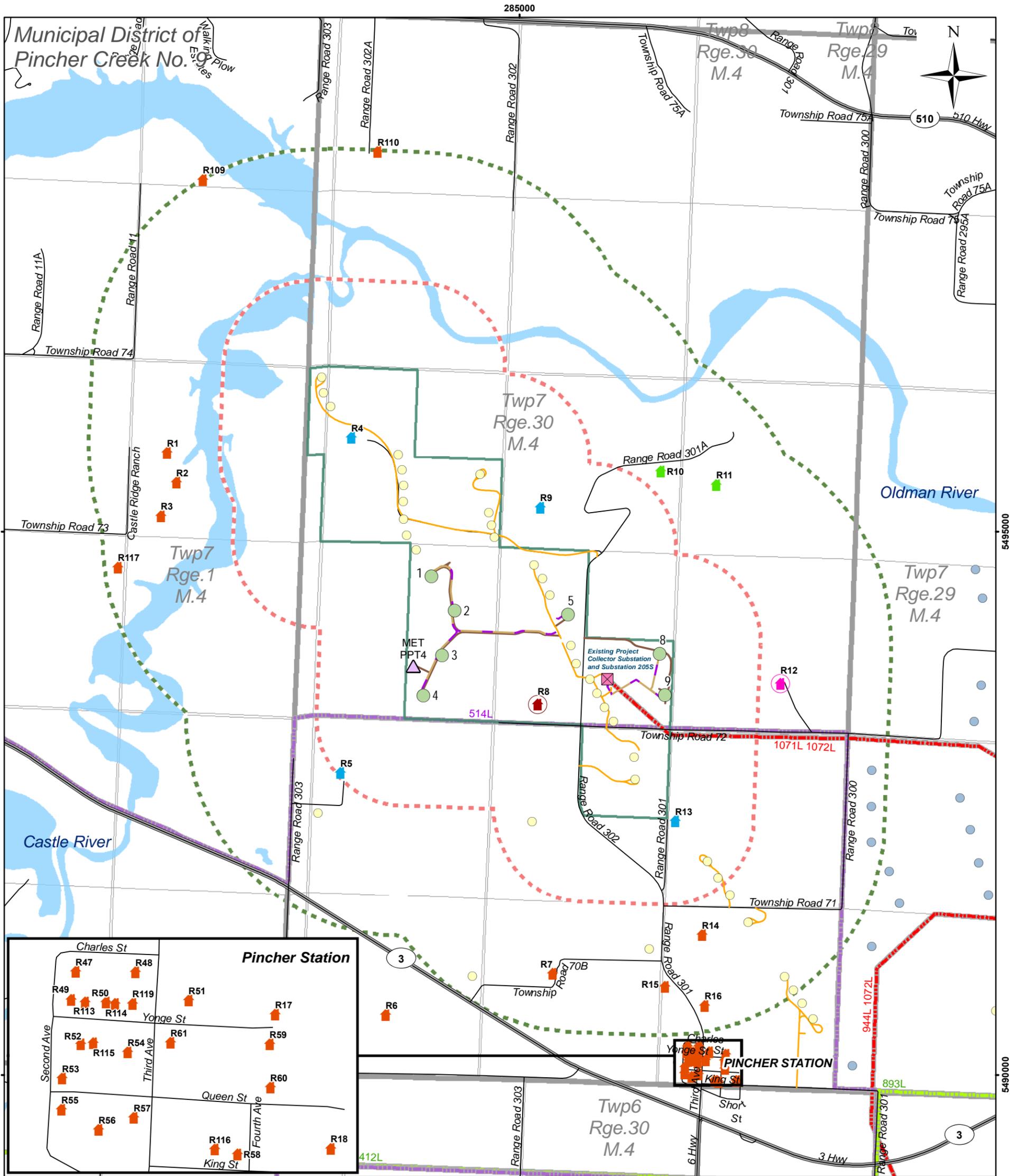
Enel Alberta Wind Inc.

(subsidiary of Enel Green Power North

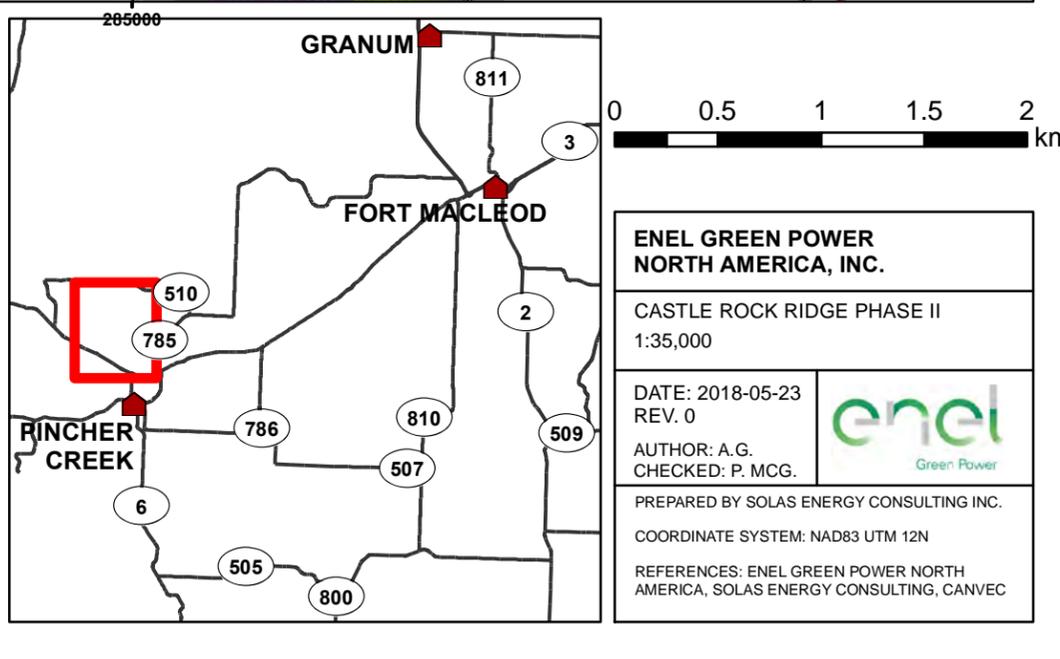
America, Inc.)

# Enel Castle Rock Ridge Phase II Wind Power Plant

## Project Layout, Shadow Flicker, and Noise Impact Map



- LEGEND**
- Residence Location outside of Noise Assessment Area
  - Residence - Noise Compliant
  - Residence - No Net Noise Increase
  - Residence - Noise Compliant, Shadow Flicker Predicted
  - Residence - No Net Noise Increase, Shadow Flicker Predicted
  - Proposed Castle Rock Ridge Phase II Turbine
  - Proposed Riverview Turbine
  - Existing Turbine
  - Meteorological Tower
  - Existing Project Collector Substation
  - Project Area
  - Existing Transmission Line 69 kV
  - Existing Transmission Line 138 kV
  - Existing Transmission Line 240 kV
  - Existing Access Roads
  - Proposed Access Road
  - Proposed Collection Line
  - Consultation Area - 800 m
  - Notification Area - 2km
  - Municipal Roads
  - Highways
  - Section Boundary
  - Township Boundary
  - Water Body



**VIEWPOINT 12: SE-26-7-1-W5M - LOOKING SOUTHEAST**

All visual simulations are based on the proposed turbine locations for Castle Rock Ridge Phase II and Riverview Wind Power Plant.

BEFORE



AFTER



**VIEWPOINT 15: HIGHWAY 3, SE-15-7-1-W5M - LOOKING NORTHEAST**

BEFORE



AFTER



## Frequently Asked Questions

### How long will construction take and what should I expect?

We anticipate construction will begin in fall 2018, and it will take approximately one and a half years to complete. Construction activities will be suspended during the winter season of 2018-2019. Construction activities include civil works, access road preparation, foundation installation, turbine erection, collector system installation, and electrical and mechanical completions. EGP will aim to minimize disruption and will discuss mitigations for dust and traffic with the Municipal District.

### Could wind turbines affect my health?

The community is top-of-mind when EGP designs wind sites. EGP works with community leaders and stakeholders to receive feedback on the wind farm design. A Health Canada study<sup>1</sup> from 2014 found that there is no scientific evidence to support negative effects on human health resulting from exposure to wind turbine noise. Under Rule 012, the Project must demonstrate that nighttime noise levels do not exceed the permissible sound level at residences located within 1.5 km of the turbines and substation. As referenced in the Health Canada study, the World Health Organization identifies that below an annual outdoor nighttime average of 40 dBA, no adverse health effects associated with sleep disturbance are expected, even among the most vulnerable people.<sup>2</sup>

### Have you considered the plants and animals that live here?

Wind energy is one of the cleanest, most environmentally-friendly energy sources. Wind energy does not emit greenhouse gases or air pollutants. Under AEP's guidelines, all wind project proponents in Alberta must evaluate and report the potential impact of their wind projects on wildlife and vegetation. In 2018, AEP reviewed our environmental reporting and provided a Wildlife Referral Report. EGP has completed an environmental constraints analysis and integrated setbacks where practical. After construction, EGP will complete post-construction environmental monitoring, as required by the AEP.

### How long will the wind farm operate?

The Project is expected to operate for at least 20 years. Near the end of the Project's life, we will evaluate whether the Project should be decommissioned or repowered. Decommissioning includes removing turbines and above-ground infrastructure. EGP will remove turbine foundations to a depth of 1.5 metres below ground. EGP will reclaim and restore all disturbed land to meet regulatory requirements at the time of decommissioning. Repowering is an alternative to decommissioning that allows wind farm owners to extend the project's life. It involves replacing project components and, often, leveraging project infrastructure. Repowering is often an attractive alternative to decommissioning a wind power project with a proven wind resource.

<sup>1</sup> Health Canada, 2014. *Wind Turbine Noise and Health Study: Summary of Results.* <sup>2</sup> WHO, 2009. *Night Noise Guidelines for Europe.*



## Introduction

Pincher Creek, L.P. through its general partner, Enel Alberta Wind Inc., is developing the Castle Rock Ridge Phase II wind power project (the Project) in your area as an expansion of the existing Castle Rock Ridge Wind Farm. Enel Alberta Wind Inc. is a subsidiary of Enel Green Power North America, Inc. (EGP).

EGP greatly values our relationship with the community, and we are committed to engaging and consulting with all stakeholders. This newsletter provides up-to-date information on this Project, and it gives us the opportunity to seek your feedback.

## Project Description

EGP is pleased to announce that in December 2017, two of our proposed projects, Castle Rock Ridge Phase II wind power project and the Riverview Wind Power Plant, were awarded contracts through the Alberta Electric System Operator's (AESO) Renewable Electricity Program (REP). We are moving forward with the regulatory process in the coming months.

EGP is proposing to develop, construct and operate the proposed 29.4 MW Project, located near the hamlet of Pincher Station, Alberta. We anticipate the Project will be under construction in late 2018 with construction continuing through 2019. The Project involves the construction of seven wind turbines, an electrical collection system, access roads, a permanent meteorological tower, and upgrades at the existing Project collector substation, adjacent to the existing Castle Rock Ridge Substation (205S). The turbines in the Project will be connected through underground collector lines that connect at the existing Project collector substation. The Project will also require a temporary laydown area during construction, and it may require upgrades to roads in the area. This newsletter includes a map of the proposed Project layout as a separate page.

The Project proposes to connect to Alberta's electric grid through an existing 240 kilovolt transmission line. The interconnection process will be covered under a separate consultation and application process that AltaLink will conduct. In 2012, EGP received approval from Alberta Utilities Commission (AUC) for the Project. Since then, we have changed the turbine model to improve the Project's overall competitiveness.

We have selected the Vestas V136-4.2 model turbine. This turbine has a capacity of 4.2 MW and allows us to reduce the number of wind turbines from the 17 initially proposed to seven turbines. The Phase II Project's total capacity is now 29.4 MW. Three of the proposed turbine locations are the same as the previously identified locations in 2012, and four are new turbine locations.

## IN THIS NEWSLETTER, YOU WILL FIND:

- Project Status
- Anticipated Project Schedule
- Wind Power Information
- Contact Information

## INSERT:

- Proposed Project Map
- Visual Simulation

## Next Steps

As we move through the regulatory and permitting process, we will continue the dialogue with landowners and stakeholders in the area. We will consider your feedback for this Project. We are seeking an amendment to the AUC approval for this Project. We intend to submit our regulatory application this summer, which will include a summary of the stakeholder feedback that we received. **We encourage you to reach out to us about the Project updates.**

## Contact Information

If you have any questions, or concerns about this Project, please contact our consultation agents at: **Tel: 1.855.300.3050 • Email: crr2@enel.com**

For more information about our operations in North America, please visit: **[www.enelgreenpower.com/en/country-north-america.html](http://www.enelgreenpower.com/en/country-north-america.html)**



**Mike Stafford**



**Chris Poitras**

The table below compares the Project information from 2012 to April 2018.

	2012 LAYOUT	2018 LAYOUT	NOTES
Turbine type	Enercon E82	Vestas V136-4.2	New turbine type
Number of turbines	17 turbines	7 turbines	Fewer turbines
Number of turbine locations	17 turbine locations	7 turbine locations	Three locations are a subset of original turbine locations; Four new turbine locations
Rated capacity	2.3 MW	4.2 MW	Larger size
Diameter	82 m	136 m	Larger rotor
Total height	105 m	150 m	Taller total height
Hub height	64 m	82 m	Taller hub height
Total Project size	39.1 MW	29.4 MW	Smaller size
Total Project maximum output to the Alberta grid	30.0 MW	29.4 MW	Minor change

Table 1: Comparison of the Turbine Type and Layout from 2012 to April 2018

### Environmental Studies

In 2012, the Project previously received a Wildlife Referral Report from Alberta Environment and Sustainable Resource Development, Alberta Environment and Parks' (AEP) predecessor. EGP conducted additional environmental studies in 2017 to update the information about the Project and surrounding area. In 2018, we received an updated Wildlife Referral Report from AEP.

### Noise Impact Analysis

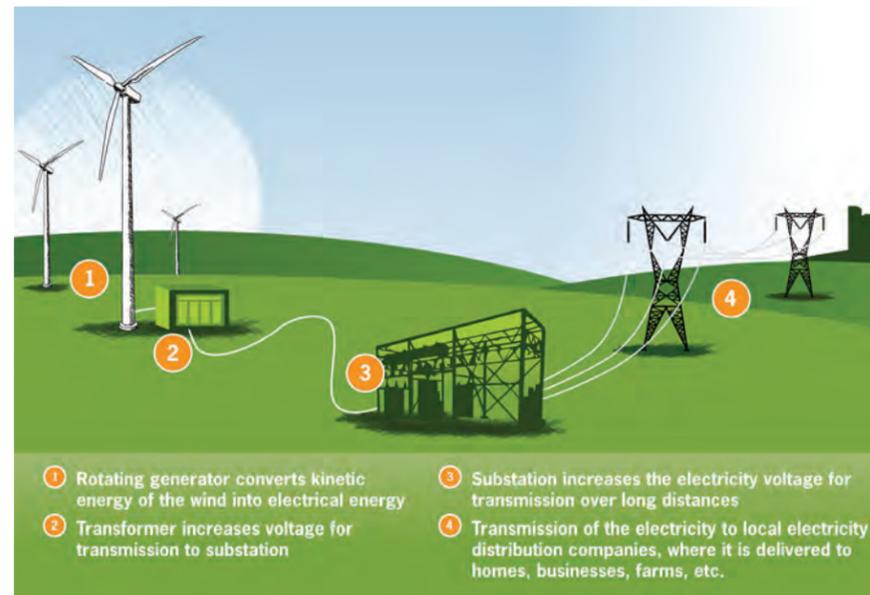
In Alberta, energy facilities must comply with AUC Rule 012: Noise Control. This rule requires the cumulative assessment of noise emissions, including existing and proposed wind power projects, oil and gas facilities, and other energy-related facilities. Under Rule 012, the Project must demonstrate that nighttime noise levels do not exceed the permissible sound level at residences located within 1.5 kilometres (km) of the turbines or the substation. In general at rural residences, the permissible sound level equivalent is 40 dBA. The Project complies with the Rule 012 requirements. The Project map identifies residences within 1.5 km of the Project that are noise compliant and those that have no net increase in noise.

### Shadow Flicker Analysis

Shadow flicker can occur when rotating turbine blades cast shadows on residences. EGP modelled shadow flicker potential effects including the probability for cloud cover. EGP did not consider mitigating factors such as window locations and physical obstructions. The attached map identifies residences that are predicted to experience shadow flicker.

### Visual Simulations

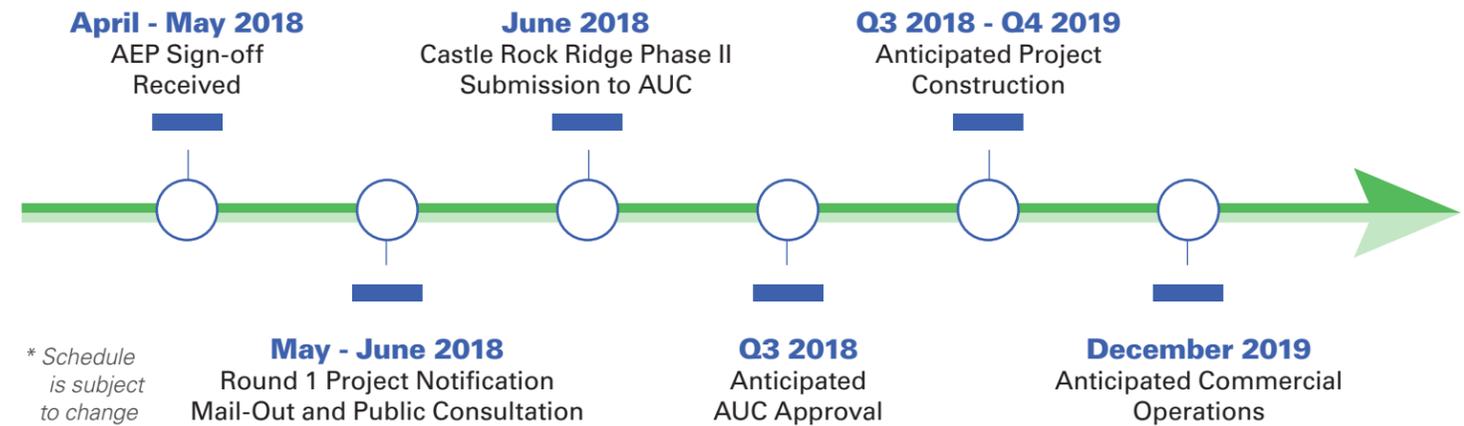
EGP has developed two visual simulations for the Project. The simulations include all seven turbine locations, existing wind farms in the region, and the proposed Riverview Wind Power Plant.



Canadian Wind Energy Association: [www.canwea.ca/wind-facts/why-wind-works](http://www.canwea.ca/wind-facts/why-wind-works)

### Anticipated Project Schedule\*

The proposed timeline for the Project is as follows:



### Engaging with the Local Community

EGP values the long-term benefits of working with the local community. The surrounding community will benefit from the following:

- Employment opportunities during construction
- Permanent employment opportunities during operations
- Contracting opportunities for local businesses
- Royalties for landowners
- Tax revenue for the Municipal District of Pincher Creek No. 9

These benefits will enrich the community throughout the 20-plus years of the Project's operational life.



### Renewable Electricity Program (REP)

Alberta is changing its mix of power generation to include more natural gas and renewable energy, including wind power. In March 2017, the AESO launched Round 1 of the REP to competitively procure renewable electricity.

EGP submitted bids for the Riverview Wind Power Plant and the Castle Rock Ridge Phase II project, and EGP was awarded two contracts in December 2017. These awards mark a major milestone for our company, and we look forward to continuing to grow here in Alberta and to investing in the Canadian economy.

The Renewable Electricity Program is:

- ROBUST
- FLEXIBLE
- SCALABLE
- SUSTAINABLE

REP Round 1 is certified as **FAIR and TRANSPARENT** by Fairness Advisor in Dec. 8, 2017 report

30 by 30

2017 Round 1 600 MW

2030 30% target

For information on the Renewable Electricity Program, visit [aeso.ca/rep](http://aeso.ca/rep)

## **Appendix M ENVIRONMENTAL PROTECTION PLAN – TRANSPORTATION PLAN FIGURES**



Subject: Environmental Protection Plan –29.4 MW Castle Rock Ridge 2 Wind Project, Alberta, Canada

**INDEX**

- 1. Environmental Protection Plan (EPP) 29.4 MW Castle Rock 2 Wind Project, Alberta Canada. 3
- 2. Department in Charge of the Document ..... 3
- 3. References ..... 3
- 4. Definitions and Acronyms ..... 3
- 5. Project Description..... 4
- 5.1 Contractor Responsibilities..... 5
- 5.4 Project Notification ..... 8
- 6. General Environmental Protection Measures..... 9
- 7.1 Surveying ..... 10
- 7.2 Vegetation Clearing and Disposal..... 11
- 7.3 Stripping and Material Excavation..... 13
- 7.4 Disposal of Excavated Material ..... 15
- 7.5 Linear Developments ..... 16
- 7.6 Ditching ..... 18
- 7.7 Construction Equipment Use and Maintenance..... 19
- 7.8 Heavy Equipment Movement Onsite..... 20
- 7.9 Dust Control ..... 21
- 7.10 Sewage and Solid Waste Disposal..... 22
- 7.11 Storage, Handling and Transfer of Fuels and Other Hazardous Materials..... 23
- 7.12 Light and Noise Levels..... 25
- 7.13 Vehicle Traffic ..... 27
- 7.14 Blasting..... 28
- 7.15 Concrete Production/Placement ..... 30
- 7.16 Marshaling and Storage Areas ..... 31
- 7.17 Avoidance of Migratory/Protected Birds and Wildlife ..... 32
- 7.18 Pumps and Generators ..... 34
- 7.19 Cattle and Livestock..... 35
- 8. Environmental Monitoring ..... 36
- 8.1 Construction ..... 36
- 8.3 Contingency Plans ..... 36
- 8.4 Fuel and Hazardous Material Spill ..... 38
- 8.5 Wildlife Encounters ..... 40
- 8.6 Discovery of Historic Resources ..... 41



Subject: Environmental Protection Plan –29.4 MW Castle Rock Ridge 2 Wind Project, Alberta, Canada

8.7 Fire..... 42

8.8 Native Prairie Protection Measures ..... 43

a) The boundaries of the right of way for access roads, underground electrical conductors, fiber optic cabling, crane pads, electrical substation and temporary work spaces will be surveyed and clearly marked with stakes and ribbon by the Contractor before construction to ensure that construction vehicles do not trespass off these marked paths. Vehicles will proceed in single file where practicable..... 43

8.9 Wetland Protection Measures ..... 45

9. Permits, Approvals And Authorizations ..... 46

10. Contacts List ..... 47

Rev.	Date	Description	PREP.	CHKD.	APPR.
01	02/16/18	Initial release	ASmith		
02	02/26/18	Updated	Stantec	ASmith	
03					
04					
05					
06					

## 1. Environmental Protection Plan (EPP) 29.4 MW Castle Rock 2 Wind Project, Alberta Canada

This Environmental Protection Plan (EPP) describes the project-specific measures to be implemented during development of the 29.4 MW Castle Rock 2 Wind Project (Project). The EPP consists of a series of general protection measures that apply to all development activities and a series of specific protection measures that apply to the various stages of construction and reclamation. These protection measures are an addendum to the construction contract specifications and should be read in conjunction with the contract documents. The Owner, Pincher Creek, LP (a limited partnership of EGPNA) is committed to protect the environment in the areas where Work is conducted as well as related off-site areas.

Adherence to the protection measures specified in the EPP will ensure that the Project is developed with the least possible disturbance to the natural environment, the least possible disruption to the current land uses and is done in accordance to the commitments made to, and permitting requirements of, the appropriate permitting authorities with jurisdiction.

## 2. Department in Charge of the Document

The Environmental Compliance and Regulatory Services group in the North America unit is responsible for drafting, updating and maintaining this document.

This document is reviewed annually, as a minimum, and updated as needed.

## 3. References

- Enel Code of Ethics;
- Zero Corruption Tolerance (ZCT) Plan;
- Organization and Management Model according to Legislative Decree no. 231 dated 8 June, 2001 – Guidelines for non-Italian Subsidiaries
- List of reference documents issued by external organizations (laws, guidelines, regulations)
- EGP NA HSE Manual
- ENA-ENV-FR-GEN-001 – Environmental Checklist
- Environmental Health and Safety Management Systems

## 4. Definitions and Acronyms

**ACCS:** Alberta Culture

**AEP:** Alberta Environment and Parks

**ASERT:** Alberta Environment Support and Environmental Response Team

**ATV:** All terrain vehicles

**AUC:** Alberta Utilities Commission

**COSEWIC:** Committee on the Status of Endangered Wildlife in Canada

**CSA:** Canadian Standards Association

**CWS:** Canadian Wildlife Service

**ECRS:** Environmental Compliance and Regulatory Services

**EGP:** Enel Green Power S.p.A.



Subject: Environmental Protection Plan –29.4 MW Castle Rock Ridge 2 Wind Project, Alberta, Canada

**EGPNA:** Enel Green Power North America, Inc.

**EMS:** Emergency Medical Service

**EPP:** Environmental Protection Plan

**ESRD:** Alberta Environment & Sustainable Resource Development. This entity was combined in 2013 from two separate government entities; Alberta Environment and Alberta Sustainable Resource Development. This department was then renamed Alberta Environment and Parks in June 2015.

**Owner:** Pincher Creek, LP

**PPE:** Personal Protective Equipment

**Project:** 29.4 MW Castle Rock Ridge 2 Wind Project

**RCMP:** Royal Canadian Mounted Police

**Safety Environment and Quality North America Area unit (SEQ):** unit within Safety Environment and Quality Department.

**WHMIS:** Workplace Hazardous Materials Information System

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**NOTICE**

Please note this document may still require revision as requested by the various regulatory bodies involved in the consultation and permitting process for the Castle Rock Ridge 2 wind power project. Information on the site emergency contact information is required; however this is to be done in consultation with the site contractor and local municipal and EMS authorities. The possibility exists of restrictions on the dates for the civil works caused by the presence of protected wildlife species on the site. As the construction plans are not finalized, the conditions of the EPP may be subject to change.

Updated revisions of the EPP, if any, will be forwarded to each party once available.

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**5. Project Description**

The Project is located approximately 4 kilometers north of the Town of Pincher Creek in southwest Alberta, Canada. The project is the second phase of Castle Rock Ridge and will be composed of 7 Vestas V136 4.2MW wind turbine generators for a total generating capacity of 29.4 MW. The wind turbine generator blades are 66 m in length with a rotor diameter of 132 m when installed. The wind turbine generators will be erected on an 82 m tall steel tower. Concrete foundations will be constructed to support the wind turbines. An electrical substation was constructed as part of Phase 1 of the Project. Access roads composed of select fill material shall be constructed and will lead to each of the wind turbine generator foundations. Turnoffs to existing access roads from Highway 3 and Highway 785 will be used to accommodate the cranes and construction equipment. The access roads will be designed to support the interim weight loads and dimensions of the Project construction equipment, most importantly the erection cranes. The access roads will be located on private property. Electrical conductors and fiber optic communications cabling will be strung to each wind turbine and buried underground.

The site plan showing the major Project components is provided in Figure 1.

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Subject: Environmental Protection Plan –29.4 MW Castle Rock Ridge 2 Wind Project, Alberta, Canada

The EPP was prepared based on a proposed Fall 2018 construction start-date with completion expected by December 1<sup>st</sup>,2019. The proposed wind farm will be constructed at a time period that meets habitat protection restrictions for nesting birds and wildlife and avoids problems associated with crop production, cattle grazing and handling of frozen soils. Vegetation clearing of access roads, collection lines, and turbine pads is scheduled to begin in Fall 2018. Full project construction will begin in April 2019. Construction of the Project will be completed as practical subject to weather and other contractual obligations. The distance between front and back end operations will be kept to a practical minimum.

### 5.1 Contractor Responsibilities

To ensure protection of the environment, the Work at all times shall be subject to inspection by the Owner and municipal, provincial and federal government agencies with jurisdiction.

For the construction of the Project, the Owner will be using a Contractor to coordinate and undertake the construction activities, whereas the operation of the Project shall be the responsibility of the Owner. This EPP assigns responsibility to either the Owner or Contractor; however, it is ultimately the responsibility of the Owner subject to contractual obligations that all practices are followed and respected.

### 5.2 Owner's and Contractor's Responsibilities

- a) The Contractor shall ensure that its employees and those of its subcontractors and sub-subcontractor and agents and vendors comply with all of the requirements of the Contract and with all applicable environmental laws, regulations, permits and requirements of federal, provincial and municipal authorities.
- b) The Owner and the Contractor will obtain all the required permits, approvals, and authorizations for the construction of the Project. Copies of all certificates and approvals acquired by the Contractor must be provided to the Owner in a timely manner, and copies are to be available and/or posted on-site as appropriate or required.
- c) The Contractor shall identify and obtain required permits to establish and/or use a Waste Disposal Area for garbage disposal. If the Contractor establishes a Waste Disposal Area for use during construction, the Contractor shall decommission and close the Waste Disposal Area prior to Final Completion of the Work.
- d) All Works related to the Project are to take place within the Project Boundary outlined in Figure 1. Any Works outside of the Project Boundary must be approved in writing prior to their commencement by the Owner.

Environmental Effects Monitoring programs have been committed to in the various supporting documents prepared for the approvals of the Project by the Owner and shall be implemented by the Owner in consultation with the appropriate regulatory authorities. Monitoring programs as conditions of permits, approvals or authorizations issued to the Contractor shall be implemented by the Contractor.

### 5.3 Owner's and Contractor's Personnel

- a) All government laws, regulations and rules pertaining to fish and wildlife (e.g., federal *Migratory Birds Convention Act* and provincial *Wildlife Act*), fires, travel, smoking and littering shall be complied with by the Contractor and its employees, its Subcontractors and Sub-subcontractors, vendors and

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Subject: Environmental Protection Plan –29.4 MW Castle Rock Ridge 2 Wind Project, Alberta, Canada

agents. There shall be no hunting, trapping or shooting within the Project Boundary. All personnel involved with field activities on the Project Site will not be permitted to have dogs or pets on Project Site during the Works.

- b) Any contravention of laws and environmental requirements by the Contractor and its employees, Subcontractors, Sub-subcontractors, vendors or agents, accidental or otherwise, resulting in environmental damage shall be reported to the Owner immediately and/or the appropriate agency with jurisdiction in the matter within the time period as stipulated in this EPP.
- c) The Contractor shall report any incident to the appropriate authorities (e.g. AEP, AUC, Environment Canada, MD Pincher Creek, etc.). The Contractor shall be responsible for clean-up, reclamation or other restorative measures as may be directed by the Owner, provincial or federal government agencies or the landowners.
- d) All construction work shall be conducted in compliance with the Canadian Centre for Occupational Health and Safety Act and its regulations.
- e) All workers shall utilize Personal Protective Equipment (PPE) appropriate to the duties being performed.
- f) All workers working at an elevation greater than 3.05 meters above grade or floor level shall wear a fall prevention system that is in accordance with the current standards of the Canadian Standards Association (C.S.A.) Code.

Figure No.

1

DRAFT

Title

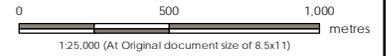
### Project Layout - Landcover

Client/Project

ENEL Green Power  
Castle Rock Ridge Wind Farm

Project Location

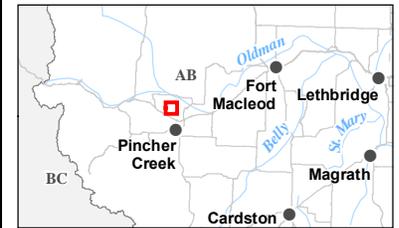
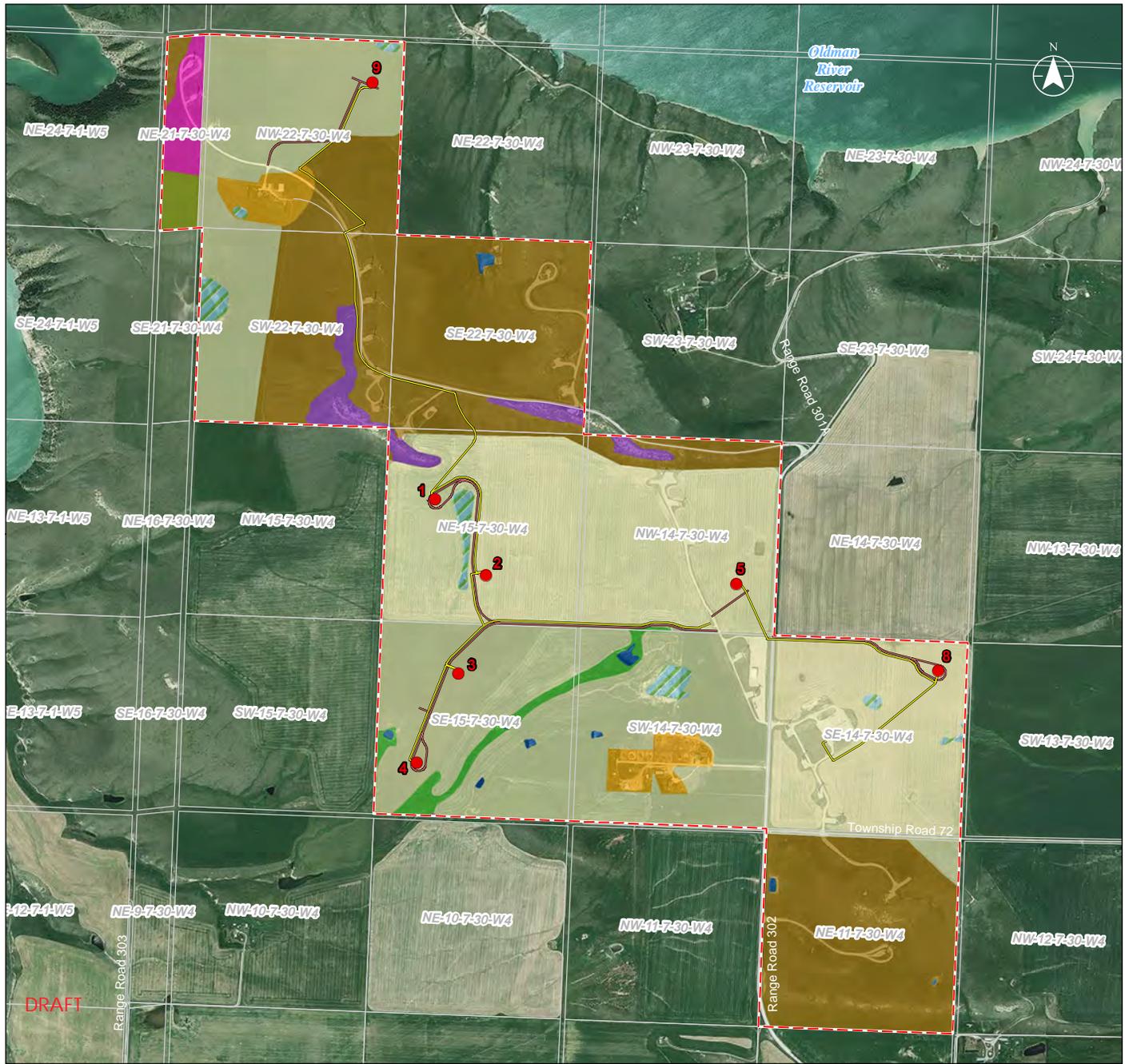
118212100-001 REVA  
Oldman Reservoir, Prepared by SB on 2018-02-27  
Southern Alberta, Technical Review by CS on 2018-02-27



- Turbine
- Collector
- Project Access Road
- Project Area

Landcover

- Cropland
- Dugout
- Hay
- Lotic
- Native Prairie
- Native Prairie Slope
- Rural
- Tame Pasture
- Wetland (GVI)



Notes

1. Coordinate System: NAD 1983 UTM Zone 12N
2. Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



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#### 5.4 Project Notification

The landowners, leaseholders, Alberta Environment and Parks, and municipal officials will be informed of project developments throughout all phases of construction if requested. Efforts will be made to minimize interference with existing land uses (agricultural activities, public highway, and road use) through timing of construction activities and consultation with stakeholders.

Prior to commencement of construction activities, a “pre-construction meeting”, will be conducted with each contractor in attendance. The appropriate representatives from the Owner’s and Contractor’s management team, environmental monitors, and construction management personnel will attend.

The purpose of this meeting is as follows:

- a) to review project issues,
- b) to describe and discuss project mitigation measures, and
- c) To address any outstanding issues.

The appropriate marshaling yard/staging area in farm land and off the native grassland will be provided for construction activities. The location of the marshaling/staging area is to be decided by the Owner.

All licenses, permits and approvals will be obtained in writing prior to any construction activities. Any inconsistencies in conditions between approval permits will be resolved prior to the commencement of construction. Copies of the permits and approvals will be retained on file and in the field office by the On Site Supervisor. All regulatory authorities, landowners, occupants, and lease holders will be notified of the project start-up date.

The landowner(s) within the area impacted by the Project will be notified of the final project schedule a minimum of two weeks prior to construction startup, to prevent or reduce disturbance caused to the landowner’s operations.

## 6. General Environmental Protection Measures

This EPP will be provided to all prospective contractors by the Owner and will form part of the Contractor's construction planning. The EPP will be part of the bid package to all bidding contractors and be included in the final contract documents for the Project.

The Owner and Contractor shall ensure that all necessary provincial and federal licenses, permits and approvals will be obtained and conditions met prior to commencement of construction. Inconsistencies between conditions of different licenses, permits, and approvals will be resolved before construction begins. A listing of the permits that may be required for the construction of the Project can be found in Section 9 – Permits, Approvals and Authorizations.

The Owner will conduct a pre-job meeting with the Contractor, applicable regulatory agencies, construction supervisors and environmental specialists to discuss project-related issues and a schedule of activities.

Contact information, including personnel, their title and phone numbers, will be provided to all parties involved in construction.

If requested, the applicable regulators such as the AEP and the Municipal District of Pincher Creek will be kept informed of all construction schedules and will be consulted regarding timing, limitations or special requests dealing with environmental protection.

All construction personnel involved with Work of the Project and their contractors, subcontractors and inspectors, will be made aware of and must abide by the Owner's corporate policies for environmental protection and any site-specific environmental concerns (i.e., the sensitivity of agricultural soils, wildlife and the prevention of grass fires) and procedures (i.e., the salvage of topsoil and the control of soil erosion) identified for this project.

Smoking on site will not be permitted by Owner or Contractor personnel, including subcontractors and vendors, except in designated smoking areas which are to be posted and marked.

The following sections provide general environmental protection procedures for activities associated with the construction and operation of the Project:

- Surveying
- Vegetation Clearing and Disposal
- Stripping and Material Excavation
- Disposal of Excavated Material
- Linear Developments
- Ditching
- Heavy Equipment Movement onsite
- Dust Control
- Sewage and Solid Waste Disposal
- Storage Handling and Transfer of Fuels and Other Hazardous Materials
- Light and Noise Levels
- Vehicle Traffic
- Blasting
- Concrete Production/Placement
- Marshaling and Storage Areas
- Avoidance of Migratory/Protected Birds and Wildlife
- Pumps and Generators

## 7.1 Surveying

### Environmental Concerns

Surveying activities may disturb wildlife species, vegetation and historic resources.

Site surveying activities will be conducted primarily on rangeland or native prairie grass. The surveying activities that may be required include:

- vegetation removal
- traversing
- establishing permanent benchmarks

### Environmental Protection Procedures

The following procedures shall be used to minimize the potential environmental effects of vegetation clearing and disposal:

- a) The boundaries of the right of way for access roads, underground electrical conductors, fiber optic cabling, crane pads, electrical substation and temporary work spaces will be surveyed and clearly marked with stakes and ribbon by the Contractor before construction to ensure that construction vehicles do not trespass off these marked paths. Vehicles will proceed in single file where practicable.
- b) All construction related activities will be conducted during suitably dry or frozen ground conditions, if practicable.
- c) Activity on native prairie shall be suspended during times of adverse ground conditions (i.e. too wet) if the activity has potential to cause unacceptable damage to soils and vegetation.
- d) Landowners will be given sufficient notice in order to salvage crops from the right-of-way. Construction will be conducted under suitably dry or frozen ground conditions.
- e) No attempt to harass or disturb wildlife shall be made by any person.
- f) Vehicles shall yield the right-of-way to wildlife.
- g) Any archeological & paleontological sites and features that are encountered shall not be disturbed. Any discovered sites shall be reported to the Historic Resources Management Branch and to the Owner (see Section 8.6 – Discovery of Historic Resources). All works are to cease in the immediate area.
- h) Vehicle and equipment activity shall be restricted to established and existing access and disturbances. No vehicle or equipment activity will be permitted outside the established construction right of way.
- i) Permanent benchmarks should be configured (with a "T" or cap) and embedded sufficiently so as to pose no hazard to persons, vehicles or animals.

## 7.2 Vegetation Clearing and Disposal

### Environmental Concern

The removal of vegetation from the Project Site could potentially alter or destroy existing or potential plant and wildlife habitat. Vegetation removal may also create the potential for increased soil erosion at the Project Site.

Vegetation clearing activities include the removal and disposal of soil, native grassland and other vegetation at the Project Site. Vegetation clearing may be required prior to access road construction, lay down areas, erection pads, transmission line pole installation and wind turbine foundation excavation.

### Environmental Protection Measures

The following procedures shall be used to minimize the potential environmental effects of vegetation clearing and disposal, particularly with the removal of native grassland:

- a) The boundaries of the access roads, underground conductor cabling, working area (i.e. laydown areas), parking, and fiber lines will be surveyed and clearly marked with stakes and ribbon by the Contractor before construction to ensure that construction vehicles do not trespass off the site access roads. Temporary access will also be clearly marked.
- b) All construction related activities will be conducted during suitably dry or frozen ground conditions, if practicable.
- c) The clearing of vegetation shall be restricted to the minimum areas needed for the Project Work.
- d) The Contractor shall stockpile all topsoil, which will remain the property of the Landowner and shall be stockpiled by the Contractor at locations directed by the Landowner of which excess material remains the property of the landowner. These locations are to be identified prior to construction.
- e) Landowners will be given sufficient notice prior to vegetation clearing in order to salvage crops from the affected area.
- f) Grading of slopes for the convenience of construction is not permissible, except as may be provided for in any approved designs and plans. Construction plans will include sod and topsoil salvage and storage requirements, erosion control measures, and specific re-vegetation and erosion control measures. Topsoil will be salvaged from all areas for use during reclamation.
- g) On some lands topsoil will be stripped and then put back and then covered by the access road according to *AENV Native Plant Revegetation Guidelines for Alberta, February 2001* specifications for native rangeland.
- h) Ditch line and cable vault locations on rangeland will be stripped according to *AENV Native Plant Revegetation Guidelines for Alberta, February 2001* standards then the top soils and the sods used at other sites for reclamation and landscaping.
- i) Revegetation of any disturbed ground surface that is not part of an access road, lay down area, underground conductor, substation base or cabling or erection pad shall be undertaken by the Contractor in order to prevent soil erosion.

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Subject: Environmental Protection Plan –29.4 MW Castle Rock Ridge 2 Wind Project, Alberta, Canada

- j) All seed mixes used for revegetation must be registered seed and acceptable to the landowners and the Municipal District of Pincher Creek district agrologist. Only Canada No. 1 Certified seed will be used for hay land and tame pasture mixes. Copies of the Certificates of Seed for each lot will be approved by the Owner prior to purchase. Copies of the Seed Certificate will be provided to the Owner. The seed type shall not be used without the written approval of the Owner's Representative.
- k) Seed mixes used on native prairie sites will be selected based on the composition of the surrounding native prairie community. Seed mixes will be certified weed free by the supplier and agreed upon with the landowner.
- l) Seeding should be done only when the potential for seed germination is high (i.e., spring or fall).
- m) No attempt to harass or disturb wildlife shall be made by any person (see Section 7.17 Avoidance of Migratory/Protected Birds and Wildlife).
- n) Vehicles shall yield the right-of-way to wildlife (see Section 7.17 Avoidance of Migratory/Protected Birds and Wildlife).
- o) Any archeological & paleontological sites and features that are encountered shall not be disturbed. Any discovered sites shall be reported to the Historic Resources Management Branch and to the Owner (see Section 8.6 – Discovery of Historic Resources). All works are to cease in the immediate area.

### 7.3 Stripping and Material Excavation

#### Environmental Concern

These activities increase the potential for erosion due to exposed soil and associated effects of runoff containing high sediment load on nearby water quality, ecosystems and environmentally sensitive areas once the overlying vegetation has been removed.

Stripping refers to the removal of topsoil. Materials excavation refers to the excavation of all other soil materials.

#### Environmental Protection Procedures

The following procedures shall be used to minimize the potential environmental effects of stripping and materials excavation:

- a) The Contractor shall ensure that surface disturbances, such as traffic, grading and vegetation clearing will be kept to a minimum, especially in environmental sensitive areas associated with native prairie and near wetlands.
- b) The boundaries of the right-of-way and temporary work spaces will be surveyed and clearly marked with stakes and ribbon by the Contractor before construction to ensure that construction vehicles do not trespass off the Project Site access roads, erection pad or underground cabling paths. Vehicles will proceed in single file where practicable.
- c) All construction related activities will be conducted during suitably dry or frozen ground conditions, where practicable.
- d) Topsoil (Zone A) will be stripped and stored separately from subsoil (Zone B). Care shall be taken during excavation operations to prevent mixing of the two topsoil zones.
- e) Topsoil and subsoil will be stored a minimum of 1.0 m distance from all other soil materials and as close to trenches as practical (0.5 m) to prevent topsoil loss.
- f) Topsoil and subsoil, where visually distinguishable, will be replaced with appropriate soils reclamation practices including seeding with local or native grasses seeds as applicable to the disturbance zone.
- g) Topsoil where it is exposed will be protected from water erosion by the installation of breaks in the topsoil windrows in low-lying areas.
- h) Topsoil, where exposed, will be protected from wind erosion by shortening the time between stripping and replacement as much as possible and by the application of soil tackifiers to the piles and windrows where required.
- i) A suitably sized back hoe or trenching equipment will be used for trench shading and backfill. Backfill will be carefully compacted with the back hoe attached tamper or rubber tired wheel compaction of a grader or suitable similar equipment to meet the engineering requirements of the backfill zone.
- j) Trench lines will be backfilled without mixing spoil with topsoil / subsoil. Stones in excess of natural conditions will be removed from the replaced spoil before topsoil / subsoil replacement.

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Subject: Environmental Protection Plan –29.4 MW Castle Rock Ridge 2 Wind Project, Alberta, Canada

- k) The established sod layer on native prairie should not be scalped when moving topsoil and spoil during backfill. Special attention by experienced grader operators should be used in native prairie areas to minimize impacts to the sensitive native sod layer.
- l) The right-of-way will be assessed for compaction and admixing of soils due to rutting; and will be restored, reclaimed or landscaped. Areas of concern will be documented and mitigation options discussed with the landowner.
- m) Topsoil and subsoil will be replaced evenly over any exposed stripped portions of the right-of-way. In native range and tame pastures, a backhoe with a Prairie Protector Blade or similar device will be used where topsoil is stored on unstripped sod.
- n) Following the completion of trench backfill and compaction with a back hoe tamper or grader wheel, any surplus spoil material will be evenly distributed back onto the ditch line.
- o) Vehicle ruts, small erosion gullies, and trench line settlement areas will be re-graded smooth to remove the potential for soil erosion during spring runoff.
- p) Stones will be picked from the subsoil surface before topsoil replacement. Stones in excess of surrounding conditions will be picked from the topsoil surface. Rocks will be disposed at locations approved by the landowner or used as fill in roads.
- q) Dewatering of excavated areas shall make use of measures to minimize and control the release of sediment laden water through the use of filtration through vegetation, erosion control devices, sediment collection ponds, check dams or other devices.
- r) Stripping and excavation activities shall be avoided where practical in areas of high slopes near watercourses.
- s) During stripping and excavation, care shall be taken that grubbed material will not be pushed onto areas which are to be left undisturbed.

## 7.4 Disposal of Excavated Material

### Environmental Concerns

These activities increase the potential for erosion due to exposed soils and the associated effects of runoff containing high sediment loads on nearby water quality, aquatic ecosystems and environmentally sensitive areas.

Waste materials are generated during excavations involved with site development and access road construction activities.

### Environmental Protection Procedures

The following procedures shall be used to help minimize the potential environmental effect of the activities associated with the disposal of excavated materials:

- a) Where appropriate, efforts shall be made to use excavated material for the construction of the access roads, laydown area and Project substation.
- b) Stones will be picked from the subsoil surface before topsoil replacement. Stones in excess of surrounding conditions (150+mm) will be picked from the topsoil surface. Rocks will be disposed at locations approved by the landowner, for erosion protection pads at culvert discharge points, or used as fill in roads.
- c) Excavated waste material shall not be disposed of in an environmentally sensitive area or near a watercourse, wetland or on native grass.
- d) The Contractor shall ensure that any excess excavated material, other than topsoil (see Section 7.2 – Vegetation Clearing and Disposal), will be stored at a location directed by the Landowner which excess material shall remain the property of the Landowner except to the extent that the same material shall be required for reclamation of the lands.

## 7.5 Linear Developments

### Environmental Concerns

The construction of access roads, underground electrical collector system and fiber optic lines and aerial electric power lines can cause local disturbance of both terrestrial and aquatic habitat as well as causing local soil erosion.

Linear developments encompass a diverse range of construction related activities which are standard operations for most project types such as access road construction, trenching for underground electrical conductor and fiber optic cabling. Topsoil and native grass are to be removed as per Section 7.2 - Vegetation Clearing and Disposal.

### Environmental Protection Procedures

#### Access Road Construction/Maintenance

- a) The Contractor shall ensure that the access road path (including width) will be clearly flagged and identified prior to construction activities.
- b) All MD and County / local roads damaged by construction equipment will be repaired to pre-disturbance conditions by the Contractor.
- c) All survey stakes, signs, and other road right-of-way debris will be removed from the public right-of-way and disposed of at an appropriate waste management facility.
- d) Water erosion prone slopes will be identified. Work shall not be undertaken on easily erodible materials during or immediately following heavy rainfall.
- e) Access roads shall be adequately ditched where necessary to allow good draining; roadside ditches shall discharge into natural drainage courses, or onto vegetated areas, to maintain natural drainage courses shall be promoted. Surface drainage will maintain natural discharge courses as possible with minimal retention or increase in velocities as reasonably attainable per good engineering practice.
- f) All damaged public access roads will be restored by the Contractor to preconstruction conditions or better upon the completion of the Works. Reclaimed bar ditches at road accesses will be seeded to the seed mix specified / approved by the Municipal District of Pincher Creek. Copies of the Certificates of Seed for each seed lot will be provided to the Owner. Fertilizer will not be applied to the re-vegetated Municipal District of Pincher Creek controlled right-of-way.
- g) The right-of way will be checked after reclamation to evaluate the success of seed germination and seedling establishment, and evaluation if weed invasion is occurring.
- h) Siltation control measures such as sediment traps and check dams shall be installed where required. Solids which accumulate in a settling pond or behind a sediment trap shall be removed on a regular basis to ensure such devices remain effective. The sediments reconverted shall be stored in a confined area where it will not be able to erode and enter a water body. Erosion control measures will be discussed with the landowners and then implemented by the Contractor. Erosion control measures could include imprinting the erosion-prone soils with an aerator, straw crimping, or the application of soil tackifier.

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Subject: Environmental Protection Plan –29.4 MW Castle Rock Ridge 2 Wind Project, Alberta, Canada

- i) Temporary fencing may be required to restrict livestock movement on the Project Site. Any permanent fencing removed to accommodate construction will be replaced immediately following construction to their original state.

#### Underground Electric Conductor and Fiber Optic Line

- a) The Contractor shall ensure that the conductor and cabling paths will be clearly flagged and identified prior to construction activities.
- b) Any approved existing access trails will be clearly marked in the field by the Contractor. Approved access trails will only be used under suitably dry or frozen ground conditions, where practicable.
- c) All damaged ditches will be restored by the Contractor to preconstruction conditions or better upon the completion of the Works. Reclaimed bar ditches at road accesses will be seeded to the seed mix specified by the Municipal District of Pincher Creek. Copies of the Certificates of Seed for each seed lot will be provided to the Owner. Copies will remain in the project file. Fertilizer will not be applied to the re-vegetated Municipal District right-of-way.
- d) The right-of way will be checked after reclamation to evaluate the success of seed germination and seedling establishment, and if weed invasion is occurring.
- e) The electrical conductor line and fiber optic cable vault locations will be stripped according to industry standards then the top soils and the sods put back for good soil reclamation and landscaping.
- f) Ditching will be closely followed by cable installation and backfilling. Long sections of open ditch will be avoided. The Contractor shall ensure that any open ditches left overnight will be clearly marked and livestock monitored.
- g) A suitably sized back hoe will be used for trench shading and backfill. Backfill will be carefully compacted with the back hoe attached tamper or rubber tired wheel compaction of a grader or suitable similar equipment to meet the engineering requirements of the backfill zone.
- h) The time between trenching and backfilling will be minimized, to reduce the potential sloughing of ditch walls and foreign material falling on the cables.
- i) Trench lines will be backfilled without mixing spoil with topsoil. Stones in excess of natural conditions will be removed from the replaced spoil before topsoil replacement.
- j) Backfill material will be compacted by running a grader tire along the trench line, once the trench has been filled to the level of the surrounding ground.
- k) All survey stakes, signs, and other road right-of-way debris will be removed from the right-of-way and disposed of at an appropriate waste management facility.

## 7.6 Ditching

### Environmental Concern

These activities increase the potential for erosion due to exposed soils and the associated effects of runoff containing high sediment loads on nearby water quality, native rangeland ecosystems, archeologically & paleontologically significant resources and environmentally sensitive areas.

Ditching is undertaken to affect drainage within the road system and to correct deficiencies such as erosion, non-conformity in grade and restrictive vegetative growth that may impede drainage. Ditching consists of excavation and grading to construct a new ditch or to re-establish an existing, deteriorated ditch.

### Environmental Protection Measures:

The following procedures shall be used to minimize the potential environmental effects associated with ditching:

- a) Ditching shall proceed in the upslope direction wherever possible.
- b) Trapezoidal ditches result in less erosion of the ditch bottom and should be installed where space requirements allow. Where this is not possible, a V-bottom design may be used.
- c) Natural drainage shall be maintained whenever practical.
- d) Ditches and overland stormwater runoff shall discharge into the natural drainage courses where practical .
- e) All ditching activities will be conducted during suitably dry or frozen ground conditions, if practical.
- f) Water erosion prone slopes will be identified.
- g) To minimize any interruption of surface water flow, a crown will not be left along the ditch line.
- h) Rip-rap or an erosion control blanket designed for high flows shall be used to line the bottom of ditches that have steep gradients and/or excessive erosion.
- i) Siltation control measures such as sediment traps shall be installed where appropriate. Solids which accumulate in a settling pond or behind a sediment trap shall be removed on a regular basis to ensure such devices remain effective.
- j) Work shall not be undertaken on easily erodible materials, or during or immediately following heavy rainfall where practicable.
- k) Activities shall not result in the deposition of debris or soil and other deleterious substances into any watercourse or water body, including on associated ice.
- l) Where practicable, shallow ditches shall be constructed and have adequate number of approaches so that the landowner can cross the roadway with farm machinery to move from one field to another which lies across the roadway.

- m) Ditching designs shall follow the requirements of Section 7.19 – Cattle and Livestock.

## 7.7 Construction Equipment Use and Maintenance

### Environmental Concerns

Environmental concerns associated with the operation and use of construction equipment includes accidental spills and chronic leaks of fuels and lubricating oils which may contaminate local water bodies and water supplies. A variety of equipment such as bulldozers, shovels, graders, water pumps, hoses and generators are frequently used in construction work as well as in their accompanying support and supply facilities.

### Environmental Protection Procedure

The following procedures shall be used to minimize the potential environmental effects associated with the equipment use and maintenance activities:

- a) The Contractor shall ensure that all construction equipment on the job site is clean, i.e., free of weeds and weed seeds, in good working order and with no oil or hydraulic fluid leaks. All equipment will be washed with high-pressure water or steam to remove any dirt and vegetative debris prior to entering the Project Site.
- b) Prior to proceeding from cultivation, tame pasture or hay land, the Contractor shall ensure that all dirt and vegetative debris will be removed from the equipment before entering native rangeland.
- c) Equipment or machinery will not be washed, serviced or re-fuelled within 100 m of a water body, wetland, or slough.
- d) Drip pans shall be placed underneath all pumps and generators located near water bodies.
- e) Hoses and connections on equipment located near water bodies shall be inspected routinely for leaks and drips.
- f) All leaks shall be repaired and reported immediately to the Contractor's On-Site Supervisor and to the Owner.
- g) All equipment is to be kept clean and in proper operating condition.
- h) Spill kits will be maintained on site as described in 7.11 - Storage Handling and Transfer of Fuels and Other Hazardous Materials.

## 7.8 Heavy Equipment Movement Onsite

### Environmental Concerns

Heavy equipment movement at the Project Site has the potential to impact archeologically & paleontologically significant resources and water quality, as well as environmentally sensitive areas. A variety of equipment is required for the various stages of project construction. This equipment includes bulldozers, backhoes, excavators, trenching equipment, large trucks, flatbed trailers, large cranes, graders, forklifts and other equipment as required.

### Environmental Protection Procedure

The following procedures shall be used to minimize the potential environmental effects associated with heavy equipment movement activities:

- a) Vehicle use on public roads, access roads, and highways within the project area will be in accordance with applicable laws and road use permits and agreements.
- b) Vehicles required for the construction of the Project are not to travel through water bodies. Vehicles are to travel in a straight line and single file as much as is possible following delineated access routes, especially on native grassland areas, and only travel through areas as required. Existing paths are to be used as much as possible.
- c) Appropriate protective materials, such as tires or plating, will be used when tracked equipment cross asphalt surfaces.
- d) Any roads damaged by construction equipment will be repaired to pre-disturbance conditions by the Contractor.
- e) Any permanent fencing removed to accommodate construction will be replaced immediately following construction to their original state.
- f) Equipment and vehicles shall only operate on the access road, laydown area, underground cabling route and cleared areas designated for construction activities.
- g) For the ditching activities for the underground cabling, tracked vehicles (i.e., track hoes, wheel ditchers, or tracked cranes) the Contractor shall avoid unnecessary damage to the sod layer outside of the ditch line.



## 7.9 Dust Control

### Environmental Concerns

Environmental concerns associated with dust within the Project Site include human health effects and potential impacts on aquatic ecosystems and vegetation.

### Environmental Protection Procedure

- a) Water is to be used as dust suppression agent. Any other products or chemicals shall be approved in writing by the Owner prior to its use.
- b) Dust from construction activities will be controlled using water. Waste oil shall not be used for dust control.

## 7.10 Sewage and Solid Waste Disposal

### Environmental Concerns

The release of untreated sewage and solid waste is a concern to human health, drinking water quality, and aquatic ecosystems. Solid waste (domestic waste, paper, cardboard, wood), if not properly controlled and disposed of, will be unsightly and may cause human safety and health concerns.

### Environmental Protection Procedures

#### Sewage:

- a) Portable toilets shall be placed temporarily on site during the Project construction. The disposal of sewage shall comply with the appropriate provincial and municipal guidelines. Sewage will be stored in holding tanks and disposed offsite in an approved manner.
- b) Development of sewage facilities shall proceed in consultation with the relevant regulatory agencies for a temporary Sewage Collection System and a certificate of approval shall be obtained from the appropriate agency. A copy of the certificate of approval shall be provided to Owner.
- c) Chlorine shall not be used for sewage waste disinfection.

#### Solid Waste:

- a) Construction debris and other garbage will be collected on a daily basis and be disposed of at an approved facility by the Contractor.
- b) The Contractor shall receive the Owner's written approval to place any temporary shelters or structures prior to their construction.
- c) Construction debris and other garbage will not be disposed of in trenches.
- d) Waste receptacles shall be installed at all active landing areas for use by workers. The Contractor shall ensure that all lunch waste and empty oil containers are recovered and disposed of properly.
- e) No waste materials shall be deposited in or within 30m of a watercourse.
- f) Waste accumulated onsite prior to disposal shall be confined so that it does not pose an environmental or health hazard.

## 7.11 Storage, Handling and Transfer of Fuels and Other Hazardous Materials

### Environmental Concerns

The major concern regarding the use of fuels and other hazardous materials is their uncontrolled release to the environment through spillage and subsequent adverse effects on terrestrial and aquatic habitat and species, soil, groundwater quality and human health and safety. Hazardous materials include oils, greases, diesel, gasoline, hydraulic and transmission fluid and lubricants.

### Environmental Protection Procedures

The following procedures shall apply to the storage, handling and transfer of fuel and other hazardous materials:

- a) The Contractor shall receive the Owner's written approval to place any temporary shelters or structures prior to their construction. Before installing fuel storage tanks, the necessary approvals in compliance with the applicable provincial regulations, if any, shall be obtained from the appropriate Provincial Government by the Contractor. Copies of the storage tank approval shall be provided to the Owner.
- b) The WHMIS program shall be implemented throughout the job site in accordance with the Alberta Occupational Health and Safety Act and regulation governed by the Workplace Health, Safety and Compensation Commission of Alberta.
- c) Hazardous materials shall be used only by personnel who are trained and qualified in the handling of these materials, clean-up in the case of their release into the environment, and only in accordance with the manufacturer's instruction and government regulation. All training will be documented.
- d) Servicing and fueling of equipment is prohibited within 100 meters of watercourses, or wetlands both seasonal and permanent and shall be carried out on a prepared impermeable surface with a collection system. Fuel tanks, including mobile fuel tanks will not be placed or parked within 100 meters of a water body, wetland or slough.
- e) All service vehicles and/or equipment used for refueling must be equipped with automatic shut-off valves and will be monitored by the operator at all times during fueling.
- f) All storage tank systems will be inspected on a regular basis. This involves, but is not limited to, gauging or dipping and the keeping of reconciliation records for the duration of the Project. All gauging or dipping is to be recorded by the Contractor and provided to the Owner upon request.
- g) A copy of the Contingency Plan for Fuel and Hazardous Material Spills shall be present at storage facilities and during transfer of fuel. In the event of a spill, the outlined procedures shall be followed. The fuel and hazardous material spills contingency plan is provided in Section 8.4 - Fuel and Hazardous Material Spill.
- h) The Contractor shall, within thirty (30) days of known decommissioning of a storage tank system, empty the system of all products, remove the tank and associated piping from the ground, remove any contaminated soil, clean the area and restore the site.

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Subject: Environmental Protection Plan –29.4 MW Castle Rock Ridge 2 Wind  
Project, Alberta, Canada

Fuel storage areas and non-portable transfer lines shall be clearly marked or barricaded to ensure that they are not damaged by moving vehicles. The markers shall be visible under all weather conditions. Fuel transfer lines shall be equipped with check valves to prevent spillage in the case of equipment failures.

- i) Drums of fuel, oil, hydraulic fluids, and other chemicals shall be tightly sealed against corrosion and rust and stored in a dry, water-tight building or shed having an impermeable floor. Waste oils and lubricants shall be retained in an appropriately labeled tank or closed container.
- j) Any and all spills are to be reported as per the instructions outlined in Section 8.4 Fuel and Hazardous Material Spill.

## 7.12 Light and Noise Levels

During construction and commissioning there will be an increase in noise levels due to increased vehicle traffic. The use of dynamite during the construction phase will also cause instantaneous noise emissions from the Site.

### Environmental Concerns

A variety of noises associated with heavy construction activity can cause avoidance by wildlife resources and alter their distribution or movements. Noises associated with blasting and heavy equipment use are temporary in nature.

Cranes and erection equipment will be used at heights where they could pose safety concerns for air navigation.

There is the potential for visual impacts to local residents as well as for migratory avian populations.

### Environmental Protection Procedures

Measures shall be implemented wherever possible to minimize potential impacts arising from a variety of noise sources:

- a) Blasting plans shall be developed and wildlife surveillance undertaken prior to blasting, as required.
- b) All vehicles and generators shall have exhaust systems regularly inspected and mufflers shall be operating properly.
- c) Lighting and working hours are to be regulated by conditions of the municipal permit (if applicable) and the consultation with local authorities. Construction activities are anticipated to take place only during daylight hours.
- d) All vehicles shall follow a designated project route and shall be properly maintained to minimize noise.
- e) The Contractor shall be responsible for ensuring all erection equipment shall be illuminated as per the requirements of the *Canadian Aviation Regulations 2005-2 Part VI General Operating and Flight Rules Standard 612.19 Standard Obstruction Markings (2005)*.
- f) Enel does not currently plan to deliver concrete or stone outside of the hours 07:00 to 22:00. It may be necessary to deliver turbine components at night as these are oversize loads and it may only be possible/feasible to transport them at night. Due to the size of turbine component delivery vehicles they must travel very slowly and therefore noise from the moving vehicles is generally not an issue at receptor locations. Enel plans to unload the components between the hours of 07:00 to 22:00 to reduce the impact of noise of cranes and for health and safety reasons. In the event that components need to be unloaded from delivery trucks outside of the hours between 07:00 to 22:00, all reasonable efforts would be made to work as slowly as possible to ensure that the noise level is kept to a minimum;
- g) Advise nearby residents of significant noise-causing activities and schedule these events to reduce disruption to them;



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Subject: Environmental Protection Plan –29.4 MW Castle Rock Ridge 2 Wind Project, Alberta, Canada

- h) If possible, take advantage of acoustical screening from local topography and on-site buildings to shield dwellings from construction equipment noise;
- i) If possible, the concrete for the foundations will be prepared off site and transported to the site; and
- j) Strict speed limits will be enforced on all site roads primarily for health and safety reasons and also to minimize construction noise.

### 7.13 Vehicle Traffic

During any construction related operations, the level of activity involving equipment movement, types of equipment and supply, etc. require various infrastructure such as roads, to conduct the work efficiently and in an environmentally acceptable manner. Typically, resource road construction is supported by vehicles ranging in size from all-terrain vehicles (ATVs) to heavy equipment, all of which can result in ground disturbance.

#### Environmental Concerns

Direct physical disturbances as a result of vehicular movements can adversely affect both terrestrial and aquatic environments.

#### Environmental Protection Procedures

- a) All construction and operational activities associated with the Project will be restricted to the surveyed rights-of-way and approved marshaling yard, temporary workspaces, and designated access roads. Construction traffic will be restricted to the existing roads, and approved existing access trails. Vehicles are to travel in a straight line and single file as much as is possible and only travel through areas as requires. Existing paths are to be used as much as possible.
- b) All construction traffic shall adhere to safety signs and road regulations. All vehicles shall not exceed the safe speed based on driving conditions and a maximum of 30 km/h on site access (private) roads.
- c) Recreational use of all-terrain vehicles by construction personnel will not be permitted on the site.
- d) All roads damaged by construction equipment will be repaired to pre-disturbance conditions by the Contractor as required.
- e) Any permanent fencing removed to accommodate construction will be replaced immediately following construction to their original state.
- f) Traffic will be strictly controlled on the unstripped portions of the access roads to “turnouts” to reduce the impact on the sod layer. Vehicle traffic will be restricted to the traffic essential for each construction activity and vehicle will remain on the Project site access roads at all times. Unnecessary two-way traffic will be discouraged.
- g) The Contractor shall ensure that the vehicles required for construction are not to travel through water bodies.

## 7.14 Blasting

Given the nature of the terrain of the Site, blasting may be required for the construction of the wind turbine foundations, access roads and erection pads. Blasting will be undertaken in association with quarry development, excavation, and foundation preparation. Blasting near water bodies will be avoided as much as possible.

### Environmental Concerns

The principal environmental concerns include the following:

- destruction of vegetation outside Project Site limits;
- noise disturbances to landowners and wildlife; and
- disturbance of archaeological and paleontological resources.

All blasting shall be done in compliance with the appropriate permits and approvals. All temporary magazines for explosive storage shall have the appropriate approvals. All permits and approvals shall be obtained by the Contractor. Copies of all permits and approvals associated with blasting and the storage of explosives shall be provided to the Owner by the Contractor.

### Environmental Protection Procedures

The handling, transportation, storage and use of explosives and all other hazardous materials shall be conducted in compliance with all applicable laws, regulations and orders the following measures shall be implemented to minimize the impact of the use of explosives and blasting:

- a) Explosives will be used in a manner that will minimize scatter of blasted material beyond the limits of the activity. Damage to the organic mat outside of disturbed areas shall be restored as required and as directed by the Contractor's Engineer.
- b) Blasting pattern and procedures shall be used which minimize shock or instantaneous peak noise levels.
- c) Blasting shall not occur in the vicinity of fuel storage facilities.
- d) The Blasters Safety Certificates and the Temporary Magazine License (from Energy, Mines and Resources Canada) will be obtained prior to drilling and blasting and copies of same shall be provided to Owner by the Contractor.
- e) Use of explosives shall be restricted to authorized personnel who have been trained in their use.
- f) Contractor shall have separate magazines on Site, a magazine for explosives and a smaller cap magazine for dynamite blasting caps.
- g) If blasting is necessary within the vicinity of an archaeological or paleontological site, precautions shall be taken to ensure that blasted material and shock waves do not disturb any part of the site. If necessary, protective covering shall be applied to the site under the supervision of an archaeologist or paleontologist. Blasting shall not be undertaken in these areas without first notifying the Owner.
- h) Blasting shall not occur within a water body. Ammonium nitrate based explosives will not be utilized in or near water bodies because of the production of toxic byproducts

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Subject: Environmental Protection Plan –29.4 MW Castle Rock Ridge 2 Wind Project, Alberta, Canada

- i) Landowners shall be made aware of the blasting plans as soon as is practicable.
- j) Blasting activities shall be done in a manner which ensures that the magnitude of explosions is limited to that which is absolutely necessary. The Contractor's On-Site Supervisor shall monitor the blast.
- k) Prior to any blasting, a visual reconnaissance of the area shall be undertaken to ensure that there are no mammals, or concentrations of birds or waterfowl. Blasting shall be delayed in such circumstances until they have been allowed to leave the area of their own accord. Under no circumstances shall noise or other devices be used to harass or otherwise disturb these animals to encourage them to leave the area of the proposed blast.
- l) The Contractor shall test any existing water wells within 1 mile of any construction site prior to construction and continue to monitor said wells for damage caused by blasting. Repairing any damage to existing wells shall be the responsibility of the Contractor.
- m) If wildlife (e.g. cattle, birds or deer) are observed then precautionary measures shall be taken. Any animal sightings shall be reported to the Contractor's On-Site Supervisor and the Owner. Precautionary measures include:
  - a. Reduced speed limits
  - b. Notification of the environmental monitor
  - c. Posting wildlife warning signs

### 7.15 Concrete Production/Placement

#### Environmental Concerns

Although cured concrete has little effect on water quality, fresh concrete and concrete products may raise the pH in receiving waters to potentially toxic levels (i.e., above pH 9).

#### Environmental Protection Procedures

The following measures will be implemented to minimize the potential impacts from concrete production or placement.

- a) Mixing of cement to form concrete will take place at least 100 meters from any watercourse.
- b) Cement or fresh concrete shall not enter any watercourse or water body. Dumping of concrete or washing of tools and equipment in any body of water is prohibited.
- c) If a concrete batch plant is to be used at the site, the measures set forth in the *Alberta Environmental Protection and Enhancement Act 2000 – Code of Conduct for Concrete Producing Plants* will be followed.

## 7.16 Marshaling and Storage Areas

### Environmental Concerns

Areas will be required for storing and maintaining equipment and supplies through the operation phase of the Project. Erosion and run-off of sediment into nearby water bodies will be prevented.

### Environmental Protection Procedures

The following measures will be implemented to minimize the potential impacts from the Marshaling and Storage areas:

- a) No marshaling or storage areas will be located on native prairie.
- b) Any new marshaling, maintenance or storage areas required for the Project Works will be established within the Project Site.
- c) Establishing any new marshaling or storage areas will follow the procedures for vegetation clearing (7.2 - Vegetation Clearing and Disposal), stripping and excavation and debris disposal (7.3 - Stripping and Material Excavation).
- d) External storage areas will be placed on level terrain and kept free of ponds or run-off.
- e) Drainage from areas of exposed fill will be controlled by grade or ditching and directing run-off away from water bodies.
- f) The established marshaling yard required for mobilization and demobilization sites for construction equipment will be located on previously disturbed areas and not on undisturbed native rangeland.
- g) All construction and operational activities associated with the Project will be restricted to the surveyed rights-of-way and approved marshaling yard, temporary workspaces, and designated access roads. Construction traffic will be restricted to the existing roads, and approved existing access trails.
- h) The boundaries of the access roads and underground cabling routes are to be clearly marked prior to construction by the Contractor.
- i) No structure or equipment shall be located within 1000 feet of any existing residence or existing barn on the Project Site without the approval of the landowner prior to construction.

## 7.17 Avoidance of Migratory/Protected Birds and Wildlife

The following outlines the requirements for the avoidance of migratory birds and other wildlife during spring and fall migration and the nesting season. Mitigation designed to minimize conflict between wildlife and activities associated with the construction phase of this Project is provided here.

### Environmental Concerns

Birds may be impacted by sediment plumes, dust, noise and activities that could disturb or destroy nesting or feeding migratory birds. Construction activities that involve clearing vegetation and building structures may cause destruction and/or disturbance to migratory birds and their habitat. Wildlife encounters pose a risk for stress or injury of both wildlife and site personnel.

### Environmental Protection Procedure

The following procedures are intended to minimize the potential effects of the Project construction on migratory birds and other wildlife:

- a) Under the *Migratory Birds Convention Act and Regulations*, no person shall deposit or permit to be deposited oil, oil wastes or any other substance harmful to migratory birds in any waters or any areas frequented by migratory birds.
- b) The nesting period for ground nesting birds in the area of the Project is, though species specific, generally from March 15<sup>th</sup> to August 31<sup>st</sup>. The Contractor should be aware that migratory birds, their eggs, nests and young are protected under the *Migratory Birds Convention Act*. Species previously observed onsite during pre-construction monitoring surveys are, though not limited to; Peregrine falcon, prairie falcon golden eagle, American kestrel, trumpeter swan, long-billed curlew, Baird's sparrow and sharp-tailed grouse (no leks observed).
- c) For areas outside of the native grassland areas, during the bird nesting season (see above); a suitable qualified bird surveyor shall survey the proposed access road, underground conductor and fiber optic path, turbine erection pad and substation locations prior to the vegetation removal to determine the presence of protected nesting birds. Surveys are scheduled for mid-March, mid-April, mid-June and one to two weeks prior to the start of construction activities which disturb ground. If nesting birds are identified, monitoring shall be undertaken once per week during construction until August 31<sup>st</sup> or until the young has fledged. Any migratory or protected species nests shall be identified and construction temporarily avoided in this area. Any discoveries shall be reported to the Owner.
- d) If the nest of any ground nesting protected bird is encountered during vegetation clearing;
  - i. The nest site and neighboring vegetation will be left undisturbed until nesting is completed,
  - ii. Construction activities will be minimized in the immediate area until nesting is completed
- e) During the bird nesting season (March 15<sup>th</sup> – August 31<sup>st</sup>), a suitable qualified bird surveyor shall survey the project site and previously identified nest locations to determine their occupancy and report their findings to the Owner.

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Subject: Environmental Protection Plan –29.4 MW Castle Rock Ridge 2 Wind Project, Alberta, Canada

- i. If a previously identified or new nest is observed to be occupied, construction activities are to be avoided during the nesting season within the appropriate setback (see table below for dates).
  - ii. If no birds are observed nesting in any new or previously identified nests during the appropriate nesting season then construction activities can take place within the appropriate setback unimpeded (see table below for dates).
  - iii. If a newly identified nest is observed during the appropriate nesting season, construction activities will be suspended within the appropriate setback of the new nest for the duration of the nesting season. Consultation with AEP will commence in order to determine appropriate mitigation methods for the new nest.
  - iv. Results of the nest monitoring shall be reported to the AEP by the Owner.
- f) No person shall disturb, destroy or take a nest or egg of a bird.
  - g) Avoid disturbances to all birds and bats in and near the project area.
  - h) Concentrations of birds, waterfowl, or raptors shall not be approached.
  - i) The Contractor shall be aware of the importance of taking measures to ensure that contaminant spills and littering, regardless of the amount, do not occur.
  - j) Site and working areas shall be kept clean of food scraps and garbage so as not to attract scavenging birds or rodents serving as prey to raptors. Waste shall be collected for disposal at an approved landfill site.
  - k) No attempts to chase, catch, divert, follow or otherwise harass wildlife by ATV, aircraft, vehicle or on foot shall be made by any person at the Project Site.
  - l) Equipment and vehicles shall yield to wildlife.
  - m) To avoid increased pressure on wildlife populations through hunting, trapping and angling, these activities shall be banned for the Contractor's personnel and that of all of its Subcontractors and vendors.
  - n) Should any sensitive species be discovered or any questions arise regarding adequate protection measures including appropriate setbacks, the environmental monitor for the project should consult with the AEP-Operations Division wildlife biologist.
  - o) Construction activities including access and collector lines associated with turbine T9 will be done outside the nesting period for golden eagles of Mar 15 – July 15 or until young have fledged.
  - p) Construction will be sequenced to avoid the critical grassland bird breeding periods of March 15<sup>th</sup> – August 31<sup>st</sup> in areas of native grasslands. Construction and erection, access construction and collector line construction on native grassland will occur between September 1<sup>st</sup> – Mar 14<sup>st</sup>. If avoidance of the RAPs are not possible, Enel will inform AEP and determine if nest searches in suitable habitat will be required.

## 7.18 Pumps and Generators

### Environmental Concerns

A variety of water pumps, hoses and generators may be in frequent use at the construction site. A back-up generator will be located at the Project substation during operation. Environmental concerns exist with regard to accidental spills or chronic leaks contaminating soil and water bodies.

### Environmental Protection Procedure

The following procedures are intended to minimize the potential effects of the Project construction caused by the operation of Pumps and Generators:

- a) Fuel must not be stored near generators or located adjacent to water bodies.
- b) Drip pans should be placed underneath pumps and generators located near water bodies.
- c) Hoses and connections on equipment located near water bodies should be inspected routinely for leaks and drips.
- d) All leaks should be reported immediately to the Owner as per Section 8.4 Fuel and Hazardous Material Spills.
- e) In addition to spill kits located at fuel storage tanks additional spill kits will be located at designated central storage location(s). Personnel who deal with fuelling, fuel transfer and pumps and generators will be trained in the use of the kits.

## 7.19 Cattle and Livestock

### Environmental Concern

While not an environmental concern, the Project Site is located on private property used for cattle grazing. Cattle may be present within the Project Site and can pose a hazard to vehicle traffic and injury to cattle.

### Environmental Protection Procedure

The following procedures are intended to minimize the potential effects of the Project construction on cattle and livestock:

- a) Wherever possible and in coordination with the Contractor and landowners, livestock will be kept out of the fields where construction will occur. Where this is not possible, temporary fences will be erected as requested by the leaseholder to control livestock and to prevent livestock from entering or leaving the field.
- b) Sufficiently sized gaps will be left in the project in all windrows (i.e. topsoil and/or spoil) at all identified farm or ranch trails, existing access roads and obvious livestock or wildlife trails. Sizing of the gaps will be based on the windrow height, surface contours and potential volume and type of cross right-of-way traffic. Open ditches will be clearly flagged. Where livestock are present, the project will limit the amount of ditch left open overnight to the extent possible.
- c) Ditching will be closely followed by cable installation and backfilling. Long sections of open ditch will be avoided. The Contractor shall ensure that any open ditches left overnight will be clearly marked and livestock monitored.
- d) The Contractor, in consultation with the landowners shall implement grazing control (rotational grazing or electric fences) if grazing is affecting revegetation.
- e) Temporary gates and livestock guards will be installed in cooperation with the landowners input at each location where the right-of-way crosses an existing fence line. At the completion of construction, any fence lines altered by the Works will be restored to the pre-existing conditions by the Contractor, unless the designs and plans indicate otherwise.

## 8. Environmental Monitoring

### 8.1 Construction

Environmental compliance on-site shall be the responsibility of all parties and reporting shall be to the Owner. Environmental specialists shall be onsite during the ground breaking activities to monitor the environmental commitments outlined in this EPP. The environmental specialists shall report their observations to the Owner and AEP wildlife biologist where appropriate. Inspections shall ensure implementation of the general and special environmental protection measures which are specified in this document and the other documents of the Contract and this EPP shall be included in all applicable subcontracts and other relevant permits, approvals and authorizations.

### 8.2 Operation

The Owner will conduct environmental monitoring programs during the operations phase of the Project as identified in the post-construction monitoring plan. Outside of the prescribed formal post-construction monitoring periods, visual inspections shall be made to determine if any bird or other carcasses are present near or around the base of the wind turbines and associated structures. Any carcasses found will be collected and reported to the AEP wildlife biologist.

Formal bird and bat surveys shall take place for the first two years following the in-service date to determine if there is an impact on the local bird or bat population. The results shall be submitted to the AEP wildlife biologist on an annual basis.

All Project vehicles are to be operated on the Project access roads so as not to cause any soil disturbance.

### 8.3 Contingency Plans

In reaching decisions on containment and clean-up procedures, the objectives of these contingency plans are to minimize the following:

- danger to persons;
- pollution to watercourses;
- area affected by the spill or fire;
- degree of disturbance to the area and watercourses during clean-up; and
- degree of disturbance to wildlife.

Notwithstanding contingency plans, the Contractor shall adopt a policy to implement preventative measures as its first line of defense against the possibility of accidents.



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Subject: Environmental Protection Plan –29.4 MW Castle Rock Ridge 2 Wind Project, Alberta, Canada

Contingency plans to deal with accidents and unplanned situations have been developed as contained herein, and will be modified as required throughout the Project.

- Fuel and Hazardous Material Spills on Land
- Wildlife Encounters
- Discovery of Historic Resources
- Fires
- Native Prairie Protection Measures
- Wetland Protection Measures

#### 8.4 FUEL AND HAZARDOUS MATERIAL SPILL

Fuel and hazardous materials can be damaging to vegetation, soil, surface water, ground water, wildlife, aquatic organisms, historic resources and human health and safety.

Environmental Protection Procedures

In the event of a fuel or hazardous material spill, the following procedures shall apply.

- a) The individual who discovers a leak or spill shall make a reasonable attempt to immediately stop the leakage and contain the flow. The individual shall report immediately to the Contractor's On-Site Supervisor the spill location, type of fuel or hazardous material, volume and terrain condition at the spill site.
- b) The Contractor's On-Site Supervisor shall act as the "On-Scene-Commander" for the purposes of cleaning up a fuel or hazardous materials spill. The Contractor's On-Site Supervisor shall be trained in spill clean-up procedures and how to mobilize the clean-up equipment. The Contractor shall have overall responsibility of coordinating a clean-up and maintaining this contingency plan current and up-to-date. The Contractor shall have full authority to take necessary and appropriate action without unnecessary delay.
- c) In the event of any spill regardless of size it must be reported immediately to the Alberta Environment Support and Environmental Response Team (ASERT) at 1-800-222-6514. Required pertinent information includes:
  - i. name of reporter and phone number;
  - ii. time of spill or leak;
  - iii. time of detection of spill or leak;
  - iv. type of product spilled or leaked;
  - v. amount of product spilled or leaked;
  - vi. location of spill or leak;
  - vii. source of spill or leak;
  - viii. type of accident - collision, rupture, overflow, other;
  - ix. owner of product and phone number;
  - x. if the spill or leak is still occurring;
  - xi. if the spill or leaked product is contained, and if not, where it is flowing;
  - xii. wind velocity and direction;
  - xiii. temperature;
  - xiv. proximity to water bodies, water intakes, and facilities; and
  - xv. snow cover and depth, terrain, and soil conditions.

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Subject: Environmental Protection Plan –29.4 MW Castle Rock Ridge 2 Wind Project, Alberta, Canada

- d) Traffic will be minimized in and around the spill site.
- e) In reaching decisions on containment and clean-up procedures, the following criteria shall be applied:
  - i. minimize danger to persons;
  - ii. protect water supplies;
  - iii. minimize pollution of watercourses;
  - iv. minimize area affected by spill; and
  - v. minimize the degree of disturbance to the area and watercourses during clean-up.
- f) The Contractor's On-Site Supervisor shall act in consultation with the regulating authorities to:
  - i. assess site conditions and environmental impacts of various cleanup procedures;
  - ii. assess potential for fuel recovery versus burning;
  - iii. deploy on-site staff to mobilize pumps and empty drums or other appropriate storage containers to the spill site;
  - iv. deploy on-site staff to build containment dykes and commence pumping contaminant into drums;
  - v. apply absorbent as necessary;
  - vi. dispose of all contaminated debris, cleaning materials and absorbent by burning (to which a permit is required), if appropriate, or by placing it in an approved land-fill site with the permission of the Owner; and
  - vii. take all necessary precautions to ensure that the incident does not recur.
- g) Spills shall be cleaned and excavated. Dirt that is contaminated with chemicals or petroleum hydrocarbons shall be replaced with natural ground cover. Excavations shall be filled and the fill shall be covered with natural ground cover. All natural ground cover shall be of a depth equal to what was there prior to the spill.
- h) The Contractor's On-Site Supervisor shall be responsible for the preparation of a written report which shall be sent (as soon as possible and no later than 7 days after the spill) to the Owner which may be provided to the appropriate regulatory agency if requested.

## 8.5 WILDLIFE ENCOUNTERS

### Environmental Concerns

Wildlife encounters including the attraction to site areas by scavengers pose a risk for stress or injury to both the wildlife and site personnel. Control measures and environmental protection procedures shall be put in place to minimize this risk to wildlife and humans.

### Response Actions

The Contractor's On-Site Supervisor shall be responsible to see that the following procedures relating to food preparation, storage and waste disposal are implemented:

- a) Site and working areas shall be kept clean of food scraps and garbage.
- b) Feeding of wildlife shall be prohibited.
- c) Waste shall be collected for disposal at an approved landfill site.
- d) No attempt to chase, catch, divert, follow or otherwise harass wildlife by ATV, aircraft, vehicle, or on foot shall be made by any person at the project site.
- e) Equipment and vehicles shall yield the right-of-way to wildlife.
- f) No personal pets, domestic or wild, shall be allowed on the Site.
- g) When animals (e.g. deer, livestock, birds and bats) are identified in the area, the Contractor's On-Site Supervisor shall be responsible for all subsequent actions.
- h) To avoid increased pressure on fish and wildlife populations through hunting, trapping and angling, these activities shall be banned for site personnel. In addition, firearms shall be prohibited on-site with the exception of that authorized for the control of nuisance animals. Such a weapon shall be accompanied by the proper permit, be safely stored and used under the direction of the Contractor's On-Site Supervisor, who must be qualified in the use of firearms.

## 8.6 DISCOVERY OF HISTORIC RESOURCES

### Environmental Concerns

As appropriate, sites shall be examined prior to the commencement of activities to determine whether the location of such activities is in an area of high archaeological potential, and to identify any site-specific precautions which should be taken. Should any archeologically & paleontologically significant resources be found, notice shall be given to the Historic Resources Management Branch by the Contractor, including the following details on procedures to conduct a field survey:

- area defined;
- nature of survey, documentation;
- report to be produced; and
- people/agencies to be advised.

### Environmental Protection Procedures

All personnel shall be informed by the Contractor of their responsibility to report any unusual findings, and to leave such findings undisturbed. In the event of the discovery of historic, prehistoric or paleontological artifacts the following procedures shall apply:

- a) Under the Alberta Historical Resources Act, all archaeological & paleontological sites shall not be disturbed. The Contractor shall take all reasonable precautions to prevent employees or other persons from removing or damaging any such articles or sites. Personnel working in the vicinity shall be advised of the find. The site area shall be flagged for protection and avoidance.
- b) Archaeological materials encountered shall be reported initially to the Contractor's On-Site Supervisor, the Owner and immediately thereafter to Minister of Culture and Community Spirit (ACCS) by the Contractor and supplied with the following information:
  - Nature of construction activity;
  - Nature of the material discovered; and
  - Precise location of the find.
- c) All work shall cease in the immediate area of the discovery until the proper authorities are advised of the discovery and, in consultation with the Owner and its Resource Archaeologist and/or Paleontologist, authorize a resumption of the work. If required, a full assessment shall be conducted of the Site and immediate area prior to resumption of work.
- d) Following an assessment of the significance and mitigation needs, a report shall be made to the Owner and the Historic Resources Management Branch. Any proposed mitigation shall first be approved by the Historic Resources Management Branch.

## 8.7 FIRE

### Environmental Concerns

Activities related to the construction of the Project could cause a fire which could spread to the surrounding area.

### Environmental Protection Procedures

The Contractor shall take all precautions necessary to prevent fire hazards when working at the Site. These include but are not limited to:

- a) Fires shall be reported immediately to the Contractor's On Site Supervisor. The Contractor's On-Site Supervisor shall act as the "On-Scene-Commander" for the purposes of controlling and reporting fires.
- b) The Pincher Creek Fire Department can be reached by dialing 911. The following information shall be provided:
  - i) name of the reporter and phone number;
  - ii) time of detection of the fire;
  - iii) size of the fire; and
  - iv) location of the fire.
- c) The Contractor shall then notify the Owner.
- d) A project specific Emergency Response and Fire Control Plan for this project will be provided to the appropriate regulatory authorities and discussed in detail at the pre-construction meeting with all contractors.
- e) The Contractor shall ensure that there is proper disposal of all flammable waste on a regular basis.
- f) The Contractor shall make available, in proper operating condition, sufficient firefighting equipment to suit its labor force and fire hazards in accordance with the guidelines specified in the Forest and Prairie Protection Act. Such equipment shall comply with, and be maintained to the manufacturer's standards.
- g) The Contractor shall train its personnel in the use of such equipment.
- h) In the event of a brush fire, the Contractor shall take immediate steps to contain or extinguish the fire.

## 8.8 NATIVE PRAIRIE PROTECTION MEASURES

The boundaries of the right-of-way and temporary work spaces will be surveyed and clearly marked with stakes and ribbon by the Contractor before construction to ensure that construction vehicles do not trespass off the Project Site access roads, erection pad or underground cabling paths. Vehicles will proceed in single file where practicable.

- a) The boundaries of the right of way for access roads, underground electrical conductors, fiber optic cabling, crane pads, electrical substation and temporary work spaces will be surveyed and clearly marked with stakes and ribbon by the Contractor before construction to ensure that construction vehicles do not trespass off these marked paths. Vehicles will proceed in single file where practicable.
- b) The Owner shall monitor activities and ensure no vehicles leave the designated areas while constructing on native prairie.
- c) Construction related activities on native grassland areas will be conducted during suitably dry or frozen ground conditions, where practicable.
- d) The clearing of vegetation shall be restricted to the minimum areas needed for Project Work.
- e) The established sod layer on native prairie should not be scalped when moving topsoil and spoil during backfill. Special attention by experienced grader operators should be used in native prairie areas to minimize impacts to the sensitive native sod layer.
- f) Topsoil and subsoil will be replaced evenly over any exposed stripped portions of the right-of-way. In native range and tame pastures, a backhoe with a Prairie Protector Blade or similar device will be used where topsoil is stored on unstripped sod.
- g) Grading of slopes for the convenience of construction is not permissible, except as may be provided for in approved designs and plans. Construction plans will include sod and topsoil salvage and storage requirements, erosion control measures, and specific re-vegetation and erosion control measures. Topsoil will be salvaged from all areas for use during reclamation.
- h) To protect topsoil removed from native grassland sites, and the seed bank within, topsoil stockpiles will be protected from wind erosion. Protection will be accomplished by shortening the time between stripping and replacement as much as possible, and by the application of soil tackifiers to the piles and windrows where required.
- i) When re-vegetating areas of native grassland, the seed selection will be determined in consultation with AEP, the municipal agronomist if on MD right of ways and the landowner if on private lands.
- j) Seeding on areas of native grassland will be completed using a drill seeder.
- k) Seeding should be done only when the potential for seed germination is high (i.e., spring or fall).
- l) Areas of native grassland that have been reseeded will be protected from wind erosion by the use of tackifier and/or erosion control fabric.

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Subject: Environmental Protection Plan –29.4 MW Castle Rock Ridge 2 Wind Project, Alberta, Canada

- m) The right-of way will be checked after reclamation to evaluate the success of seed germination and seedling establishment, and if weed invasion is occurring.
- n) Ditch line and cable vault locations on native grassland will be stripped according to *AENV Native Plant Revegetation Guidelines for Alberta, February 2001* standards. Top soil and sod will then be used at other sites for reclamation.
- o) Prior to proceeding from cultivation, tame pasture or hay land, the Contractor shall ensure that all dirt and vegetative debris will be removed from the equipment before entering native rangeland.
- p) The established marshaling yard required for mobilization and demobilization sites for construction equipment will be located on previously disturbed areas and not on undisturbed native rangeland.
- q) Activity on native prairie shall be suspended during times of adverse ground conditions (i.e. too wet) if the activity has potential to cause unacceptable damage to soils and vegetation.
- r) For turbines, access road and collector lines that will infringe into native grassland areas, construction activities shall not occur during the nesting season from March 15<sup>th</sup> to August 31<sup>st</sup>

## 8.9 WETLAND PROTECTION MEASURES

While most wetlands have been avoided during the planning of the Project, a dugout/reservoir is located within 100 m which may be impacted by the development of the Project. Wetlands, including dugouts/reservoirs) may serve as breeding and staging areas for birds and waterfowl as well as provide habitat for amphibians and other aquatic organisms.

- a) For turbines, access road and collector lines that will be located inside the recommended wetland (dugout/reservoir) setback, mitigation shall include silt fences, limiting work areas, erosion control measures, prompt reclamation and seeding to maintain ecological function of the wetland (dugout/reservoir).
- b) For any turbines, access road and collector lines that may infringe into an identified wetland, construction activities shall not occur during the nesting season from March 15<sup>th</sup> to August 31<sup>st</sup>.
- c) The boundaries of the right-of-way and temporary work spaces will be surveyed and clearly marked with stakes, ribbon and fencing by the Contractor before construction to ensure that construction vehicles do not trespass off the Project Site access roads, erection pad or underground cabling paths.
- d) The Owner shall monitor activities and ensure no vehicles leave the designated areas while constructing on native prairie. Vehicles will proceed in single file where practicable.
- e) Construction related activities in wetland setback areas will be conducted during suitably dry or frozen ground conditions, where practicable.
- f) The clearing of vegetation within wetlands setbacks shall be restricted to the minimum areas needed for Project Work.
- g) Vehicle and equipment activity shall be restricted to established and existing access and disturbances. No vehicles or equipment activity will be permitted outside an established construction right of way.
- h) Disturbance shall only be considered in wetlands approved through an Alberta *Water Act* Clearance and in accordance with the directives of Alberta Environment and Parks.

Subject: Environmental Protection Plan –29.4 MW Castle Rock Ridge 2 Wind Project, Alberta, Canada

## 9. Permits, Approvals And Authorizations

The table below lists the permits, approvals and authorizations which may be required and will be obtained for the construction and operation of the Project. The Owner will be responsible for the permits in Table 8.1.

Table 8.1 Permits and Authorizations that may be required by Owner

Permit, Approval or Authorization	Issuing Agency
<b>Provincial</b>	
Signoff Letter	Alberta Environment and Parks
Power Plant Approval	Alberta Utilities Commission (AUC)
Historical Resources Act Clearance	Historic Resources Management Branch, Alberta Culture (AC)
<b>Federal</b>	
Safety Lighting for Wind Turbine Operators	Transport Canada
Aeronautical Obstruction Clearance Form	NavCanada
<b>Municipal</b>	
Development Permit	Municipal District of Pincher Creek No. 9
Road Use Agreement	Municipal District of Pincher Creek No. 9

The Contractor shall be responsible for obtaining all other permits, approvals and authorizations required for the construction of the Work including, but not limited to, Municipal, Provincial and Federal permits.



Subject: Environmental Protection Plan –29.4 MW Castle Rock Ridge 2 Wind Project, Alberta, Canada

## 10. Contacts List

### Emergency Information

#### For Fire / Emergency

**Pincher Creek Emergency Services (Fire/EMS)**

**911**

**RCMP (Police)**

**911**

#### For Hazardous Material and Fuel Spills

Alberta Environment Support and Environmental Response Team (ASERT)

1-800-222-6514

### Non-Emergency Information

#### Pincher Creek Emergency Services (Fire/EMS)

655 Charlotte Street (or Box 1086)

Pincher Creek, AB

TOK 1W0

Non-Emergency Tel: (403) **627-5333**

#### Royal Canadian Mounted Police (RCMP) – Pincher Creek Detachment

659 Main Street (Box 1118)

Pincher Creek, AB

TOK 1W0

Non-Emergency Tel: (403) 562-2867

#### Spills and Hazardous Materials

Alberta Environment Environmental 24 Hour Hotline

**1-800-222-6514**

Available Internet: <http://environment.alberta.ca/2860.html>

#### Municipal District of Pincher Creek No.9 - Public Works Office

1051 Macleod Street

Pincher Creek, Alberta, Canada

Phone: (403) 627-3484

Fax: (403) 627-3474

#### Municipal District of Pincher Creek No.9 – Agricultural Services Board Headquarters

Pincher Creek Municipal Airport

1001 Township Road 7-0

Pincher Creek, Alberta, Canada

TOK 1W0

Phone: (403) 627-4151

Fax: (403) 627-3075



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Subject: Environmental Protection Plan –29.4 MW Castle Rock Ridge 2 Wind  
Project, Alberta, Canada

**Minister of Culture and Community Spirit – Historic Resources Management**

Historic Resources Management Branch  
Old St. Stephen's College  
8820 - 112 Street NW  
Edmonton, Alberta, Canada  
T6G 2P8  
Tel: (780) 431-2300

**Alberta Environment and Parks**

Environment and Parks  
2nd Floor, Avail Building  
530-8th St. South  
Lethbridge, AB T1J 2J8  
(403)-381-5526 (Brandy Downey – Wildlife Biologist)

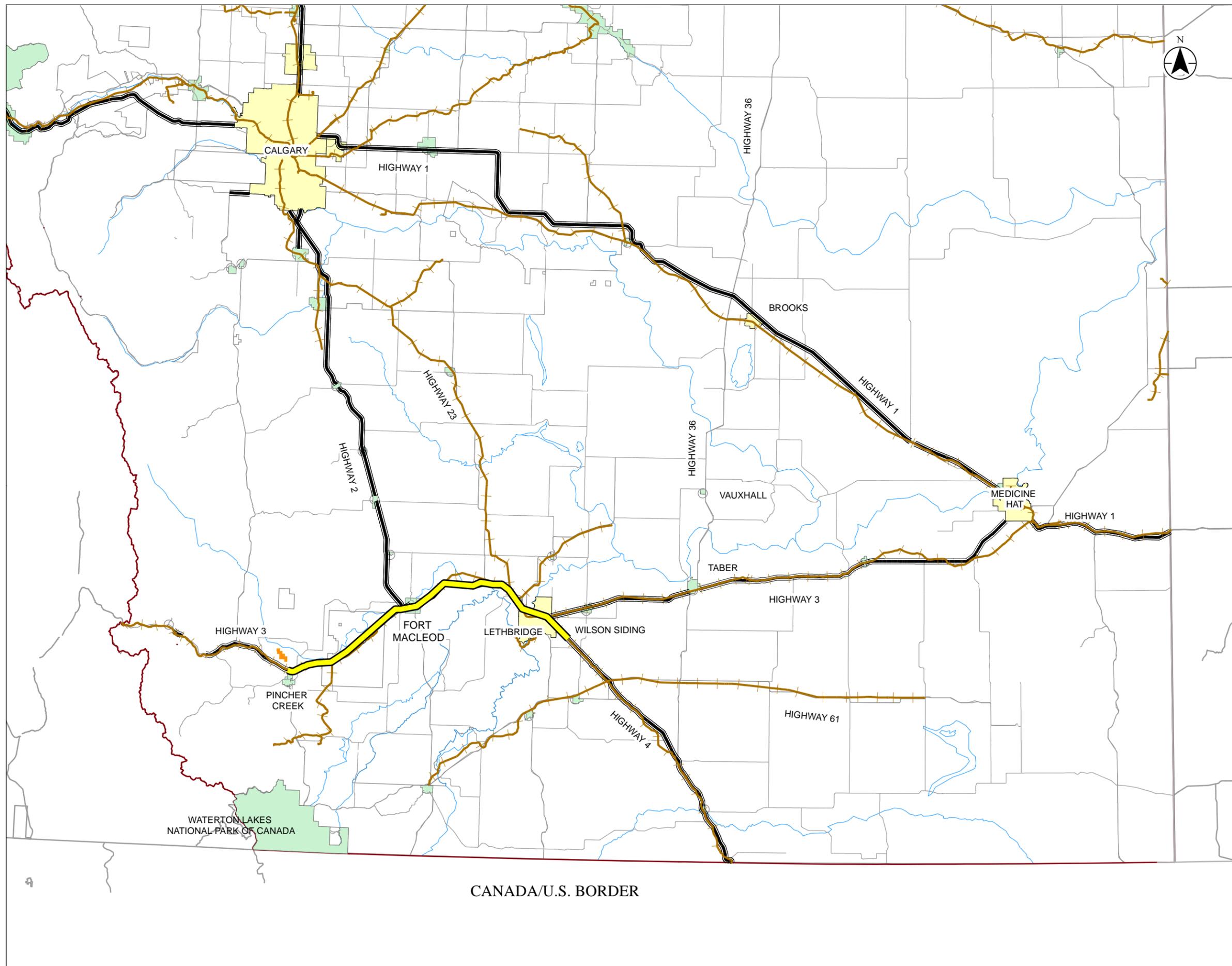


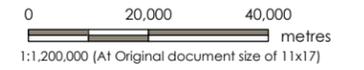
Figure No.  
1

Title  
**Logistics Plan - Turbine  
Component Deliveries**

Client/Project  
Pincher Creek Limited Partnership  
Castle Rock Ridge Phase II



Project Location  
Municipal District of Pincher Creek  
Alberta, Canada  
118212100 REVA



**Legend**

- Project Location
- Highway Delivery Route
- Railway
- Primary Highway
- Secondary Highway
- Municipalities

Notes  
1. Coordinate System: NAD 1983 UTM Zone 12N



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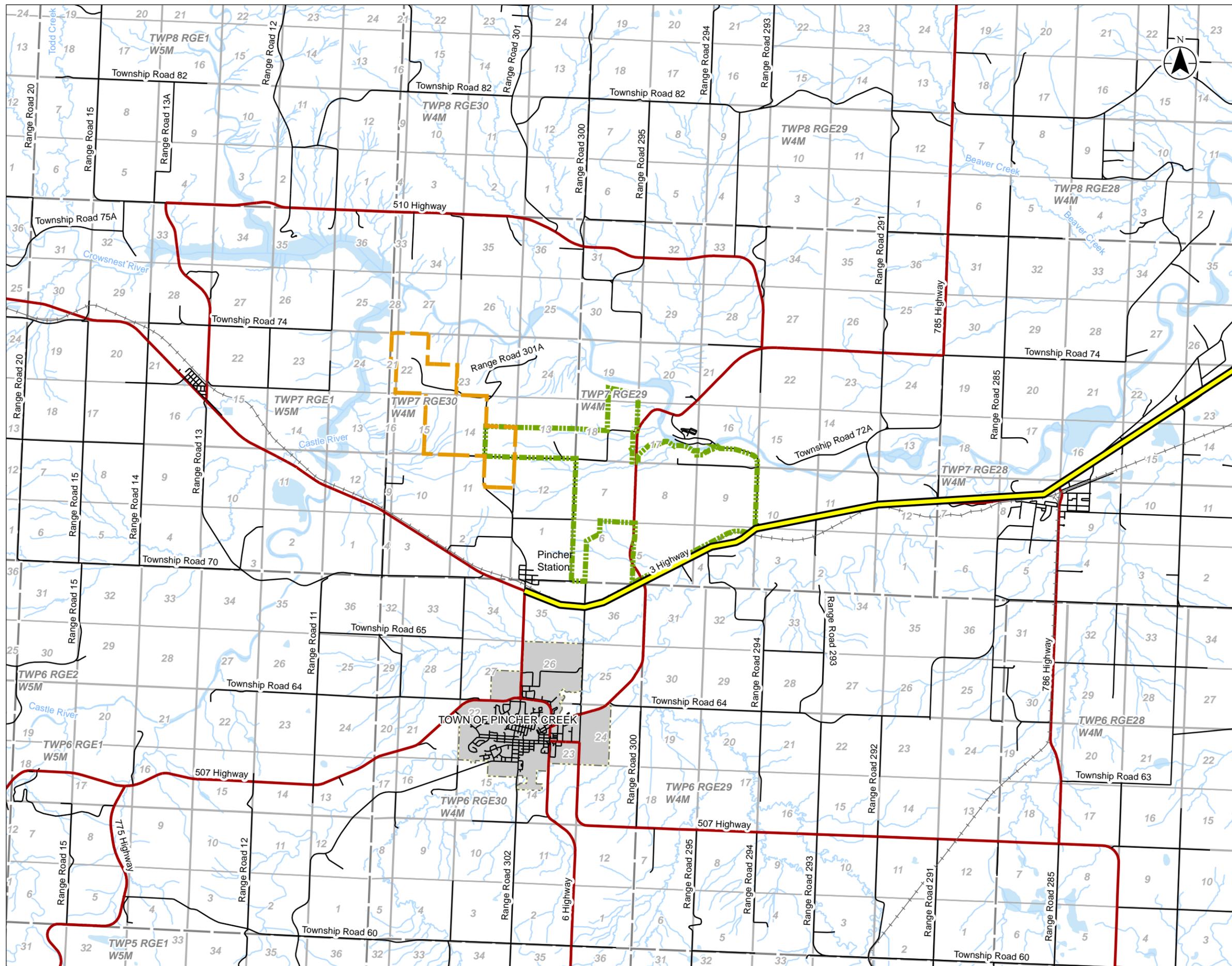


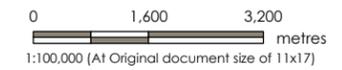
Figure No. **2**  
 Title **Location Plan**

Client/Project  
 Pincher Creek Limited Partnership  
 Castle Rock Ridge Phase II

Project Location  
 Municipal District of Pincher Creek  
 Alberta, Canada



118212100 REV A



- Legend**
- Project Location
  - Highway Delivery Route
  - Riverview Wind Power Plant Project Location
  - Railway
  - Major Road
  - Minor Road
  - Urban Municipality
  - Township
  - Section
  - Qtr Section
  - Watercourse
  - Waterbody

**Notes**  
 1. Coordinate System: NAD 1983 UTM Zone 12N



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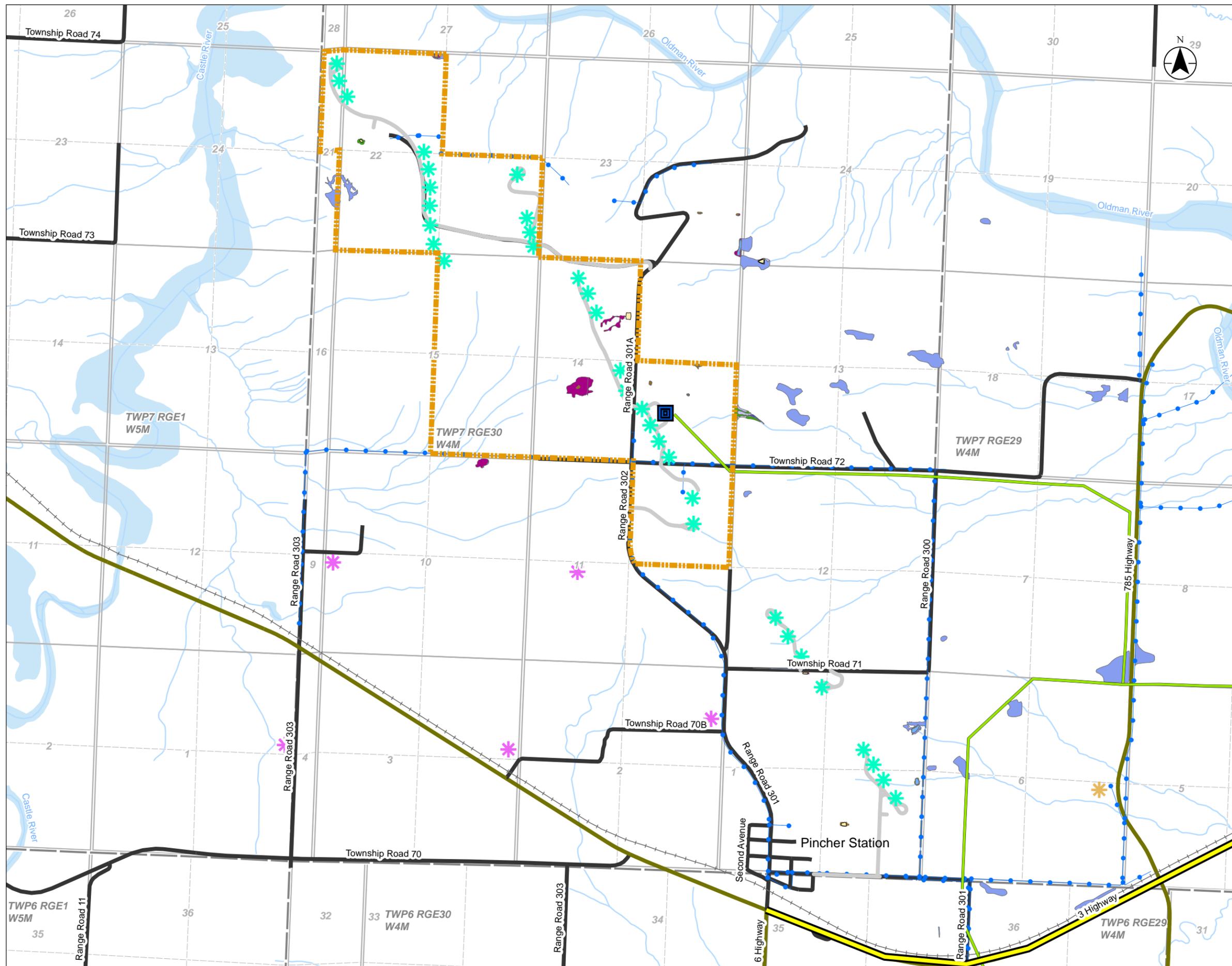


Figure No. **3**  
 Title **Existing Conditions**  
 Client/Project Pincher Creek Limited Partnership  
 Castle Rock Ridge Phase II   
 Project Location Municipal District of Pincher Creek  
 Alberta, Canada 118212100 REVA



- Legend**
- Project Location
  - Castle Rock Substation
  - Castle Rock Ridge Phase I Turbine
  - Optimist Turbine
  - Sinnot Turbine
  - Castle Rock Ridge Phase I Access Roads
  - Highways Delivery Route
  - Allalink OH Transmission Line
  - Overhead Low Voltage Power Line
  - Wetland
  - Dugout
  - Flowing Water (Herb)
  - Flowing Water (Shrub)
  - Standing Water (Open Water)
  - Standing Water (Seasonal)
  - Standing Water (Semi-Perma...)
  - Standing Water (Temporary)
  - Railway
  - Major Road
  - Existing County Roads
  - Township
  - Section
  - Qtr Section
  - Watercourse
  - Waterbody

**Notes**  
 1. Coordinate System: NAD 1983 UTM Zone 12N



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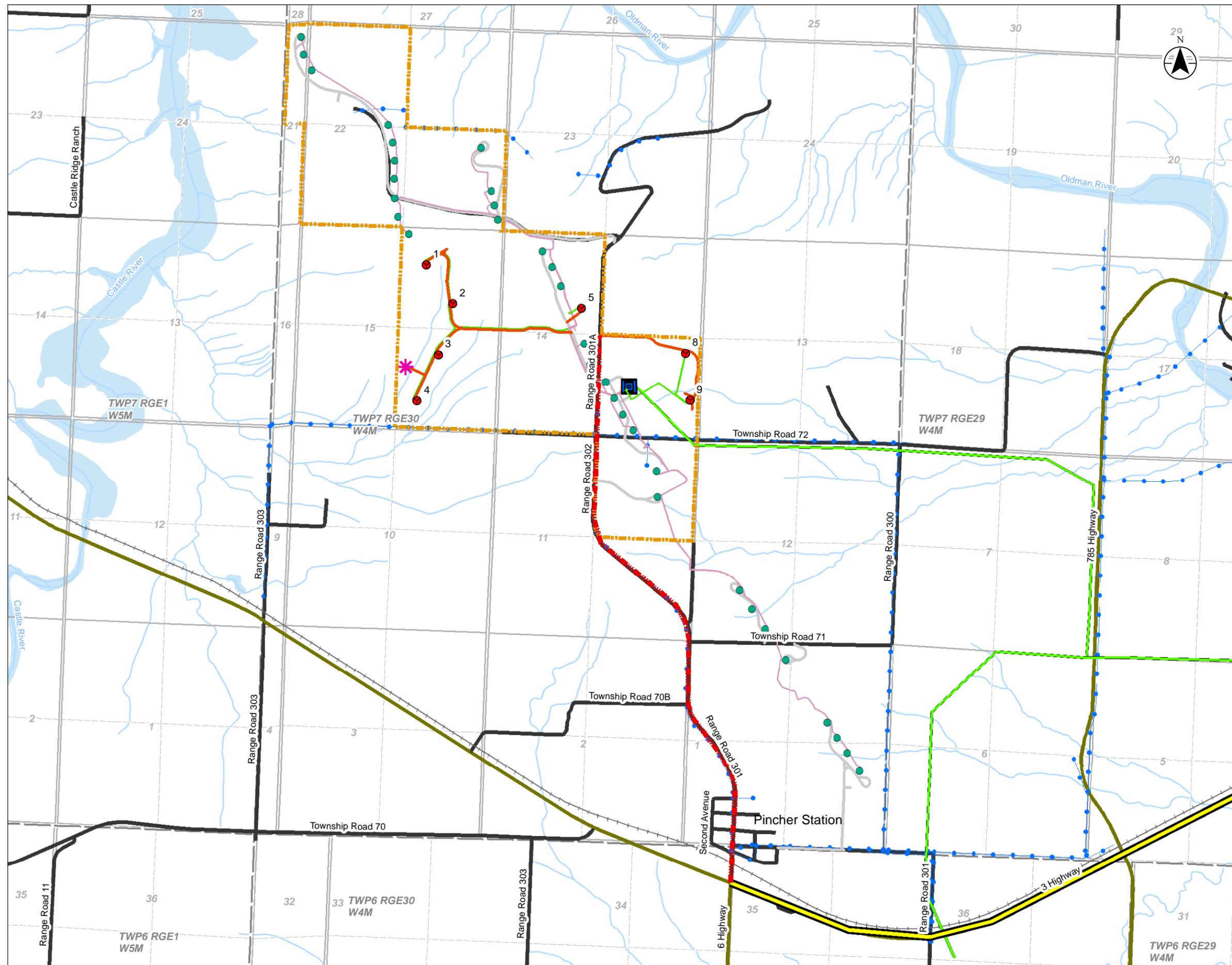


Figure No. **4**  
 Title **Layout A009 Heavy Haul Route**

Client/Project  
 Pincher Creek Limited Partnership  
 Castle Rock Ridge Phase II

Project Location  
 Municipal District of Pincher Creek  
 Alberta, Canada



118212101 REVA



**Legend**

- |                                   |  |             |
|-----------------------------------|--|-------------|
| Layout A009 - V136 4.2MW - 82m HH | Castle Rock Substation                 | Township    |
| Project Location                  | Castle Rock Ridge Phase 1 Turbine      | Section     |
| Highway Delivery Route            | Castle Rock Ridge Phase I Collector    | Qtr Section |
| Met Tower                         | Castle Rock Ridge Phase I Access Roads |             |
| Altalink OH Transmission Line     | Overhead Low Voltage Power Line        |             |
| Access Road Phase II              | Railway                                |             |
| Collector Phase II                | Major Road                             |             |
|                                   | Existing County Roads                  |             |

**Notes**  
 1. Coordinate System: NAD 1983 UTM Zone 12N



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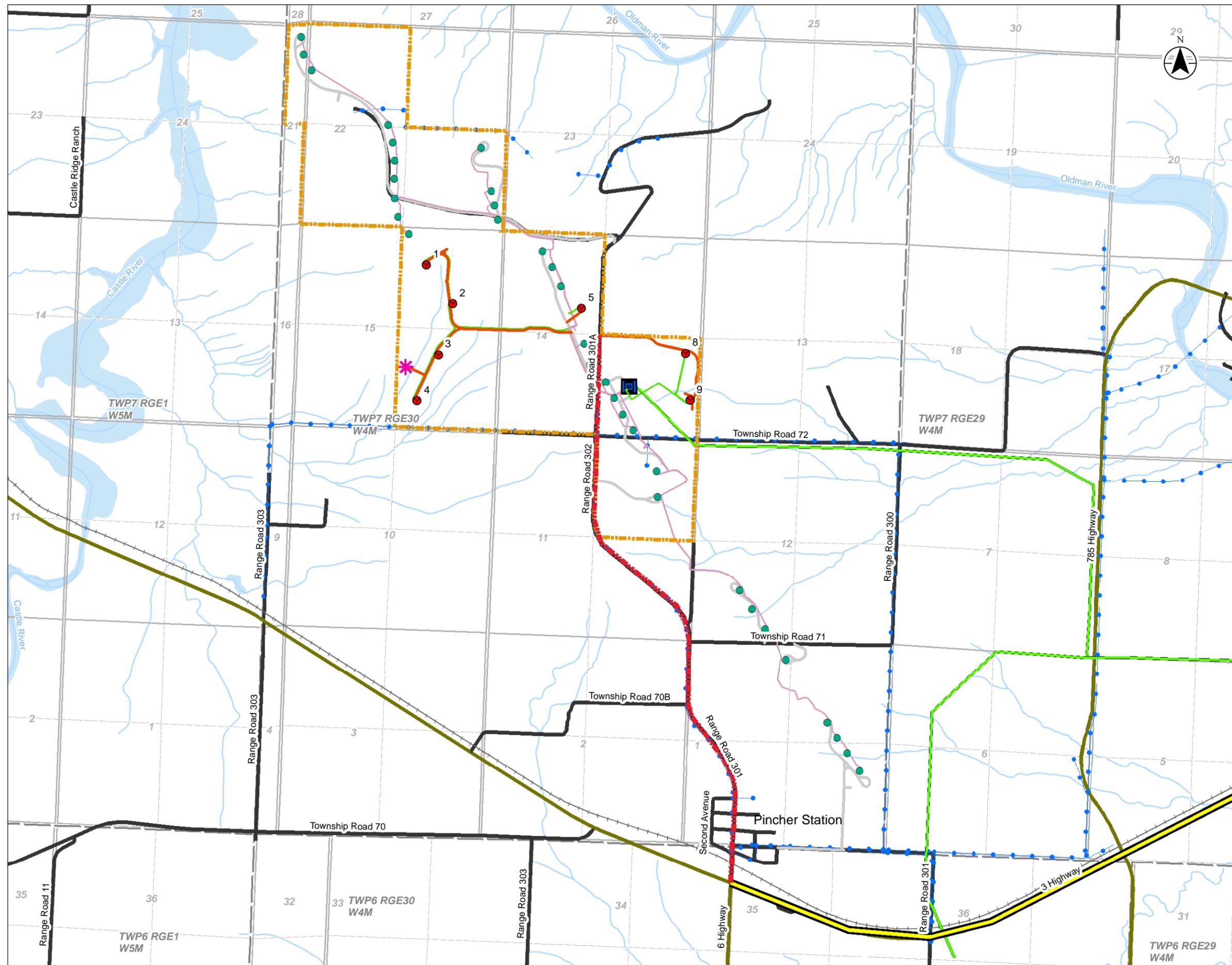
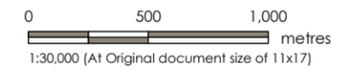


Figure No. **5**  
 Title **Layout A009 Light Vehicle Route**  
 Client/Project Pincher Creek Limited Partnership  
 Castle Rock Ridge Phase II   
 Project Location Municipal District of Pincher Creek  
 Alberta, Canada 118212101 REVA



- Legend**
- Layout A009 - V136 4.2MW - 82m HH
  - Light Vehicle Route
  - Project Location
  - Highway Delivery Route
  - Met Tower
  - Altalink OH Transmission Line
  - Access Road Phase II
  - Collector Phase II
  - Existing Castle Rock Substation
  - Existing Castle Rock Ridge Phase 1 Turbine
  - Castle Rock Ridge Phase I Collector
  - Castle Rock Ridge Phase I Access Roads
  - Overhead Low Voltage Power Line
  - Railway
  - Major Road
  - Existing County Roads
  - Township
  - Section
  - Qtr Section
  - Watercourse
  - Waterbody

**Notes**  
 1. Coordinate System: NAD 1983 UTM Zone 12N



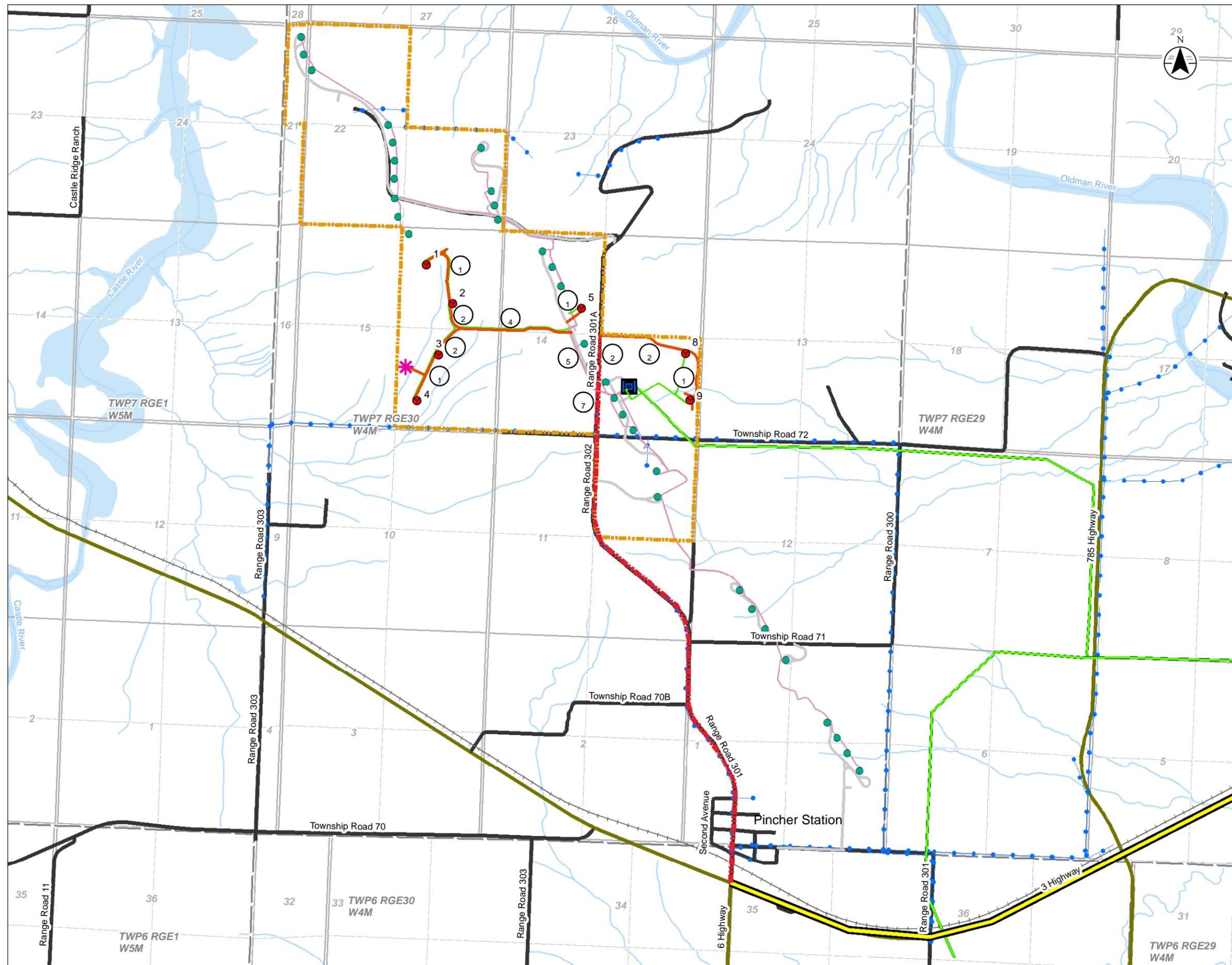


Figure No. **6**  
 Title **Turbine Delivery Route Traffic Counts**  
 Client/Project Pincher Creek Limited Partnership  
 Castle Rock Ridge Phase II   
 Project Location Municipal District of Pincher Creek  
 Alberta, Canada 118212101 REVA



- Legend**
- Layout A009 - V136 4.2MW - 82m HH
  - Castle Rock Ridge Phase 1 Turbine
  - Heavy Haul Route
  - Castle Rock Ridge Phase I Collector
  - Project Location
  - Castle Rock Ridge Phase I Access Roads
  - Highway Delivery Route
  - Overhead Low Voltage Power Line
  - Met Tower
  - Altalink OH Transmission Line
  - Railway
  - Access Road Phase II
  - Collector Phase II
  - Major Road
  - Existing County Roads
  - Township
  - Section
  - Qtr Section
  - Castle Rock Substation
  - Watercourse
  - Waterbody

Road Segment Turbine Delivery Count

**Notes**  
 1. Coordinate System: NAD 1983 UTM Zone 12N



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## Appendix N VESTAS BROCHURE

**Vestas**<sup>®</sup>

# 4 MW PLATFORM

**Wind.** It means the world to us.<sup>™</sup>

# Are you looking for the maximum return on **your investment** in wind energy?

Wind energy means the world to us. And we want it to mean the world to our customers, too, by maximising your profits and strengthening the certainty of your investment in wind power.

That's why, together with our partners, we always strive to deliver cost-effective wind technologies, high quality products and first class services throughout the entire value chain. And it's why we put so much emphasis on the reliability, consistency and predictability of our technology.

We have more than 35 years' experience in wind energy. During that time, we've delivered 92 GW of installed capacity in 79 countries. That is more than anyone else in the industry. We currently monitor over 33,000 wind turbines across the globe. All tangible proof that Vestas is the right partner to help you realise the full potential of your wind site.

## **What is the 4 MW Platform today?**

The Vestas 4 MW platform\* was introduced in 2010 with the launch of the V112-3.0 MW<sup>®</sup>. Over 18 GW of the 4 MW platform has been installed all over the world onshore and offshore making it the obvious choice for customers looking for highly flexible and trustworthy turbines.

Since then the 4 MW platform was upgraded and new variants were introduced utilising untapped potential of the platform. All variants carry the same nacelle design and the hub design has been re-used to the largest extent possible. In addition, our engineers have increased the nominal power across the entire platform improving your energy production significantly.

With this expansion, the 4 MW platform covers all IEC wind classes with a variety of rotor sizes and a higher rated output power of up to 4.2 MW.

You can choose from the following turbines on the 4 MW platform:

- V105-3.45 MW<sup>™</sup> – IEC IA
- V112-3.45 MW<sup>®</sup> – IEC IA
- V117-3.45 MW<sup>®</sup> – IEC IB/IEC IIA
- V117-4.2 MW<sup>™</sup> – IEC IB/IEC IIA/IEC S
- V126-3.45 MW<sup>®</sup> – IEC IIB/IEC IIA
- V136-3.45 MW<sup>®</sup> – IEC IIB/IEC IIIA
- V136-4.2 MW<sup>™</sup> – IEC IIB/IEC S
- V150-4.2 MW<sup>™</sup> – IEC IIIB/IEC S

All variants of the 4 MW platform are based on the proven technology of the V112-3.0 MW<sup>®</sup> with a full-scale converter, providing you with superior grid performance.

Our 4 MW platform is designed for a broad range of wind and site conditions, enabling you to mix turbines across your site or portfolio of sites, delivering industry-leading reliability, serviceability and exceptional energy capture, optimising your business case.

All turbine variants are equipped with the same ergonomically designed and very spacious nacelle which makes it easier for maintenance crews to gain access, so they can reduce the time spent on service while maximizing the uptime without compromising safety. All turbines can be installed and maintained using standard installation and servicing tools and equipment further reducing the operation and maintenance costs by minimising your stock level of spare parts.

\* Formerly named the Vestas 3 MW platform



**+64,000**

The V112-3.45 MW<sup>®</sup> and the other 4 MW variants advance the already proven technology powering over 64,000 installed Vestas turbines worldwide - more than any other supplier.

# How does our technology generate **more energy?**

## **More power for every wind site**

V112-3.45 MW<sup>®</sup>, V117-3.45 MW<sup>®</sup>, V117-4.2 MW<sup>™</sup>, V126-3.45 MW<sup>®</sup>, V136-3.45 MW<sup>®</sup>, V136-4.2 MW<sup>™</sup> and V150-4.2 MW<sup>™</sup> are available with several Sound Optimised Modes to meet sound level restrictions with an optimised production. The power system enables superior grid support and it is capable of maintaining production across severe drops in grid voltage, while simultaneously minimising tower and foundation loads. It also allows rapid down-rating of production to 10 per cent nominal power.

## **Proven technologies - from the company that invented them**

The 4 MW platform is a low-risk choice. It is based on the proven technologies that underpin more than 64,000 Vestas turbines installed around the world. Using the best features from across the range, as well as some of the industry's most stringently tested components and systems, the platform's reliable design minimises downtime – helping to give you the best possible return on your investment.

With an operating range that covers all wind classes, our 4 MW platform delivers unrivalled energy production. The proven blade technology from the V112-3.0 MW<sup>®</sup> is used on the V105-3.45 MW<sup>™</sup>, the V112-3.45 MW<sup>®</sup>, V117-3.45 MW<sup>®</sup> and V117-4.2 MW<sup>™</sup>. The industry known structural shell blades are used on the V126-3.45 MW<sup>®</sup>, V136-3.45 MW<sup>®</sup>, V136-4.2 MW<sup>™</sup> and V150-4.2 MW<sup>™</sup> - a technology which is also used on the 2 MW V110-2.0 MW<sup>®</sup>, V116-2.0 MW<sup>™</sup> and V120-2.0 MW<sup>™</sup> variants.

## **Reliable and robust**

The Vestas Test Centre is unrivalled in the wind industry. We test most nacelle components using Highly Accelerated Life Testing (HALT) to ensure reliability. For critical components, HALT identifies potential failure modes and mechanisms. Specialised test rigs ensure strength and robustness for the gearbox, generator, yaw and pitch system, lubrication system and accumulators. Our quality-control system ensures that each component is manufactured to design specifications and performs at site. We systematically monitor measurement trends that are critical to quality, locating defects before they occur.

The 4 MW platform covers all wind segments enabling you to find the best turbine for your specific site.

### WINDCLASSES - IEC

TURBINE TYPE	IEC III (6.0 - 7.5 m/s)	IEC II (7.5 - 8.5 m/s)	IEC I (8.5 - 10.0 m/s)
<b>4 MW TURBINES</b>			
V105-3.45 MW™ IEC IA			Standard IEC conditions
V112-3.45 MW® IEC IA			Standard IEC conditions
V117-3.45 MW® IEC IB/IEC IIA		Standard IEC conditions	Standard IEC conditions
V117-4.2 MW™ IEC IB/IEC IIA/IEC S		Standard IEC conditions	Standard IEC conditions
V126-3.45 MW® IEC IIA/ IEC IIB	Standard IEC conditions	Standard IEC conditions	Site dependent
V136-3.45 MW® IEC IIB/ IEC IIIA	Standard IEC conditions	Standard IEC conditions	Site dependent
V136-4.2 MW™ IEC IIB/IEC S	Standard IEC conditions	Standard IEC conditions	Site dependent
V150-4.2 MW™ IEC IIIB/IEC S	Standard IEC conditions	Site dependent	Site dependent

■ Standard IEC conditions    ■ Site dependent

### Options available for the 4 MW platform

An option is an extra feature that can be added to the turbine to suit a project's specific needs. By adding options to the standard turbine, we can enhance the performance and adaptability of the wind power project and facilitate a shorter permitting cycle at restricted sites. The options can even be a decisive factor in realising your specific project, and the business case certainty of the investment.

Here is a list of the options available for the 4 MW platform:

- Power Optimised Modes
- Load Optimised Modes
- Condition Monitoring System
- Service Personnel Lift
- Vestas Ice Detection
- Vestas De-Icing
- Low Temperature Operation to - 30°C
- Fire Suppression
- Shadow detection
- Increased Cut-In
- Aviation Lights
- Aviation Markings on the Blades
- Vestas IntelliLight™

### Life testing

The Vestas Test Centre has the unique ability to test complete nacelles using technologies like Highly Accelerated Life Testing (HALT). This rigorous testing of new components ensures the reliability of the 4 MW platform.



# Is the 4 MW platform the optimal choice for **your specific site?**

## **One common nacelle – six different rotor sizes**

The wind conditions on a wind project site are often not identical. The 4 MW platform features a range of turbines that cover all wind classes and combined across your site they can maximise the energy output of your wind power plant.

## **Tip-height restrictions and strict grid requirements**

With a rotor size of 105 m, the V105-3.45 MW™ IEC IA is the turbine that fits the most severe wind conditions. It has an extremely robust design for tough site conditions and is especially suited for markets with tip-height restrictions and high grid requirements.

Like all the other 4 MW turbines, the V105-3.45 MW™ is equipped with a full-scale converter ensuring full compliance with the challenging grid codes in countries like the UK and Ireland.

## **Cold climates**

The V112-3.45 MW®, V117-3.45 MW®, V117-4.2 MW™, V126-3.45 MW®, V136-3.45 MW® can be combined with Vestas De-Icing and Vestas Ice Detection ensuring optimum production in cold climates.

The Vestas De-Icing System is fully SCADA integrated and can be triggered automatically or manually depending on your de-icing strategy. Automatic control protects your investment, optimising the trigger point so the turbine only stops to de-ice when there is an expected net power production gain.

## **High- and medium-wind sites**

The V112-3.45 MW® IEC IA is a high-wind turbine and has a very high capacity factor. Similar to the other 4 MW turbines, the V112-3.45 MW® IEC IA turbine makes efficient use of its grid compatibility and is an optimal choice for sites with MW constraints.

On medium wind-sites, the V117-3.45 MW® IEC IB/IEC IIA, V126-3.45 MW® IEC IIA/IEC IIB, V136-3.45 MW® IEC IIB/IEC IIIA and V136-4.2 MW IEC IIB/IEC S are excellent turbine choices. A combination of the variants can optimise your site layout and improve your production significantly on complex sites.

## **Low-wind sites**

Built on the same proven technology as the V112-3.0 MW®, the V150-4.2 MW™ IEC IIIB/IEC S is our best performer on low-wind sites. The larger rotor enable greater wind capture, which in turn produces more energy to reduce levelised cost of energy (LCOE). The result is exceptional profitability in areas with low wind, and new frontiers for wind energy investment.

Large Diameter Steel Towers (LDST) support the added rotor size and rating of Vestas turbines to increase Annual Energy Production on low-wind sites. LDST is specially designed with a larger diameter in the bottom section that allows for optimal strength at high hub heights.

## **Maximising old permits**

Although the V150-4.2 MW™ is one of the highest producing low wind turbines available, some old permits may simply be too tight to accept it. Although the V117-3.45 MW®, V126-3.45 MW®, V136-3.45 MW® and V136-4.2 MW™ are medium-wind turbines, they still deliver an excellent business case on low-wind sites.

Due to the similar electrical properties and nacelle design, it is easy to mix and match the turbines from the 4 MW platform to maximise production on heavily constrained sites.



# Would you **benefit** from uninterrupted control of wind energy production?

## **Knowledge about wind project planning is key**

Getting your wind energy project up and operating as quickly as possible is fundamental to its long-term success. One of the first and most important steps is to identify the most suitable location for your wind power plant. Vestas' SiteHunt® is an advanced analytical tool that examines a broad spectrum of wind and weather data to evaluate potential sites and establish which of them can provide optimum conditions for your project.

In addition, SiteDesign® optimises the layout of your wind power plant. SiteDesign® runs Computational Fluid Dynamics (CFD) software on our powerful in-house supercomputer Firestorm to perform simulations of the conditions on site and analyse their effects over the whole operating life of the plant. Put simply, it finds the optimal balance between the estimated ratio of annual revenue to operating costs over the lifetime of your plant, to determine your project's true potential and provide a firm basis for your investment decision.

The complexity and specific requirements of grid connections vary considerably across the globe, making the optimal design of electrical components for your wind power plant essential. By identifying grid codes early in the project phase and simulating extreme operating conditions, Electrical PreDesign provides you with an ideal way to build a grid compliant, productive and highly profitable wind power plant. It allows customised collector network cabling, substation protection and reactive power compensation, which boost the cost efficiency of your business.

## **Advanced monitoring and real-time plant control**

All our wind turbines can benefit from VestasOnline® Business, the latest Supervisory Control and Data Acquisition (SCADA) system for modern wind power plants.

This flexible system includes an extensive range of monitoring and management functions to control your wind power plant. VestasOnline® Business enables you to optimise production levels,



# +33,000

The Vestas Performance and Diagnostics Centre monitors more than 33,000 turbines worldwide. We use this information to continually develop and improve our products and services.

monitor performance and produce detailed, tailored reports from anywhere in the world. The VestasOnline® Power Plant Controller offers scalability and fast, reliable real-time control and features customisable configuration, allowing you to implement any control concept needed to meet local grid requirements.

### **Surveillance, maintenance and service**

Operating a large wind power plant calls for efficient management strategies to ensure uninterrupted power production and to control operational expenses. We offer 24/7 monitoring, performance reporting and predictive maintenance systems to improve turbine performance and availability. Predicting faults in advance is essential, helping to avoid costly emergency repairs and unscheduled interruptions to energy production.

Our Condition Monitoring System (CMS) assesses the status of the turbines by analysing vibration signals. For example, by measuring the vibration of the drive train, it can detect faults at

an early stage and monitor any damage. This information allows pre-emptive maintenance to be carried out before the component fails, reducing repair costs and production loss.

Additionally, our Active Output Management® (AOM) concept provides detailed plans and long term agreements for service and maintenance, online monitoring, optimisation and troubleshooting. It is possible to get a full scope contract, combining your turbines' state-of-the-art technology with guaranteed time or energy-based availability performance targets, thereby creating a solid base for your power plant investment. The Active Output Management® agreement provides you with long term and financial operational peace of mind for your business case.

# V136-4.2 MW™

## IEC IIB/IEC S

### Facts & figures

**POWER REGULATION** Pitch regulated with variable speed

**OPERATING DATA**  
 Rated power 4,000 kW/4,200 kW  
 Cut-in wind speed 3 m/s  
 Cut-out wind speed 25 m/s  
 Re cut-in wind speed 23 m/s  
 Wind class IEC IIB/IEC S  
 Standard operating temperature range from -20°C\* to +45°C with de-rating above 30°C (4,000 kW)

\*subject to different temperature options

**SOUND POWER**  
 Maximum 103.9 dB(A)\*\*

\*\*Sound Optimised modes dependent on site and country

**ROTOR**  
 Rotor diameter 136 m  
 Swept area 14,527 m<sup>2</sup>  
 Air brake full blade feathering with 3 pitch cylinders

**ELECTRICAL**  
 Frequency 50/60 Hz  
 Converter full scale

**GEARBOX**  
 Type two planetary stages and one helical stage

**TOWER**  
 Hub heights Site and country specific

**NACELLE DIMENSIONS**  
 Height for transport 3.4 m  
 Height installed (incl. CoolerTop®) 6.9 m  
 Length 12.8 m  
 Width 4.2 m

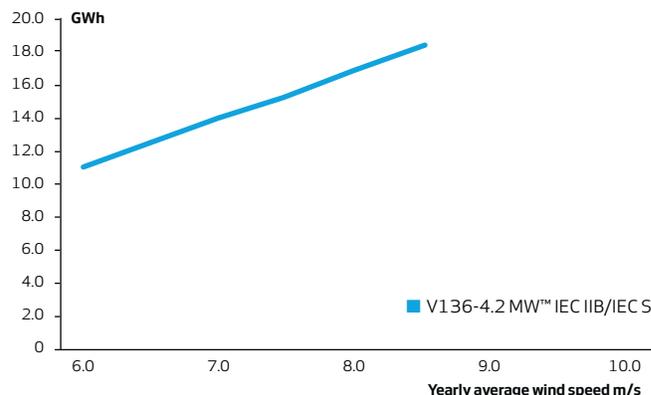
**HUB DIMENSIONS**  
 Max. transport height 3.8 m  
 Max. transport width 3.8 m  
 Max. transport length 5.5 m

**BLADE DIMENSIONS**  
 Length 66.7 m  
 Max. chord 4.1 m

Max. weight per unit for transportation 70 metric tonnes

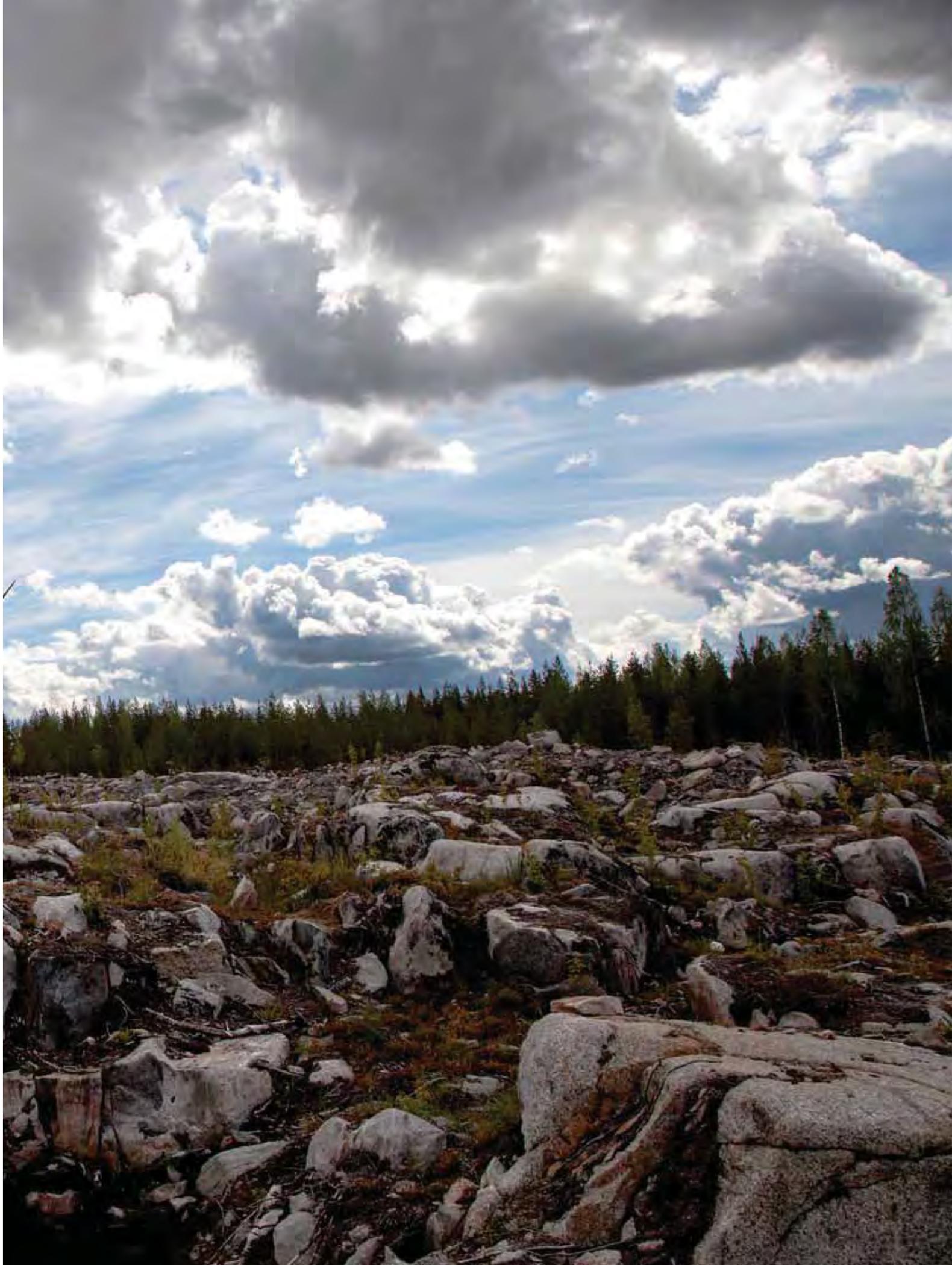
- TURBINE OPTIONS**
- High Wind Operation
  - 4.2 MW Power Optimised Mode (site specific)
  - Load Optimised Modes down to 3.6 MW
  - Condition Monitoring System
  - Service Personnel Lift
  - Vestas Ice Detection
  - Low Temperature Operation to - 30°C
  - Fire Suppression
  - Shadow detection
  - Increased Cut-In
  - Aviation Lights
  - Aviation Markings on the Blades
  - Vestas IntelliLight®

#### ANNUAL ENERGY PRODUCTION



**Assumptions**  
 One wind turbine, 100% availability, 0% losses, k factor =2, Standard air density = 1.225, wind speed at hub height





# Appendix O STARS

The Proponent is currently in consultation with STARS

# Pincher Creek LP (Enel Alberta Wind Inc.) - Castle Rock Ridge Phase II - STARS

Jason Mah

Fri 5/25/2018 5:38 PM

To: info@stars.ca <info@stars.ca>;

Cc: Victor.Engel@enel.com <Victor.Engel@enel.com>; Ashley.Smith@enel.com <Ashley.Smith@enel.com>; CRR2@enel.com <CRR2@enel.com>; Paula McGarrigle <Pmcgarrigle@solasenergyconsulting.com>;

📎 2 attachments (5 MB)

CRR2 Turbine Locations V1.0 25MAY2018.xlsx; 11985-Plan-CRR2-A009-20180514.pdf;

Hello,

On behalf of Pincher Creek, L.P., by its general partner Enel Alberta Wind Inc., I am contacting you with regards to their proposed Castle Rock Ridge Phase II (Project) near Pincher Creek, Alberta. We would like your input on potential interference between STARS operations and the Project. The Project is in the design stage and subject to change upon consultation with stakeholders. Attached you will find a map of the Project land and turbine locations, as well as a spreadsheet listing the proposed turbine locations. Coordinates are provided with a datum of NAD83.

The following information is provided to assist you in your analysis:

- Project Name: Castle Rock Ridge Phase II
- Proponent: Pincher Creek, L.P., by its general partner Enel Alberta Wind Inc.
- Number of Turbines: 7
- Hub Height: 82m
- Rotor Diameter: 136m
- Total Height to Blade Tip: 150m

Your response indicating if there will be potential conflicts between STARS and the proposed wind farm is greatly appreciated. If potential conflicts are identified, we would like to discuss possible mitigation measures to address your concerns.

**Jason Mah**, E.I.T., B.Sc. ChE.

Junior Renewable Energy Analyst

**Solas Energy Consulting Inc.**

Suite 119, 2-2009 31 Ave S.W. Calgary, Alberta, T2T1Z5

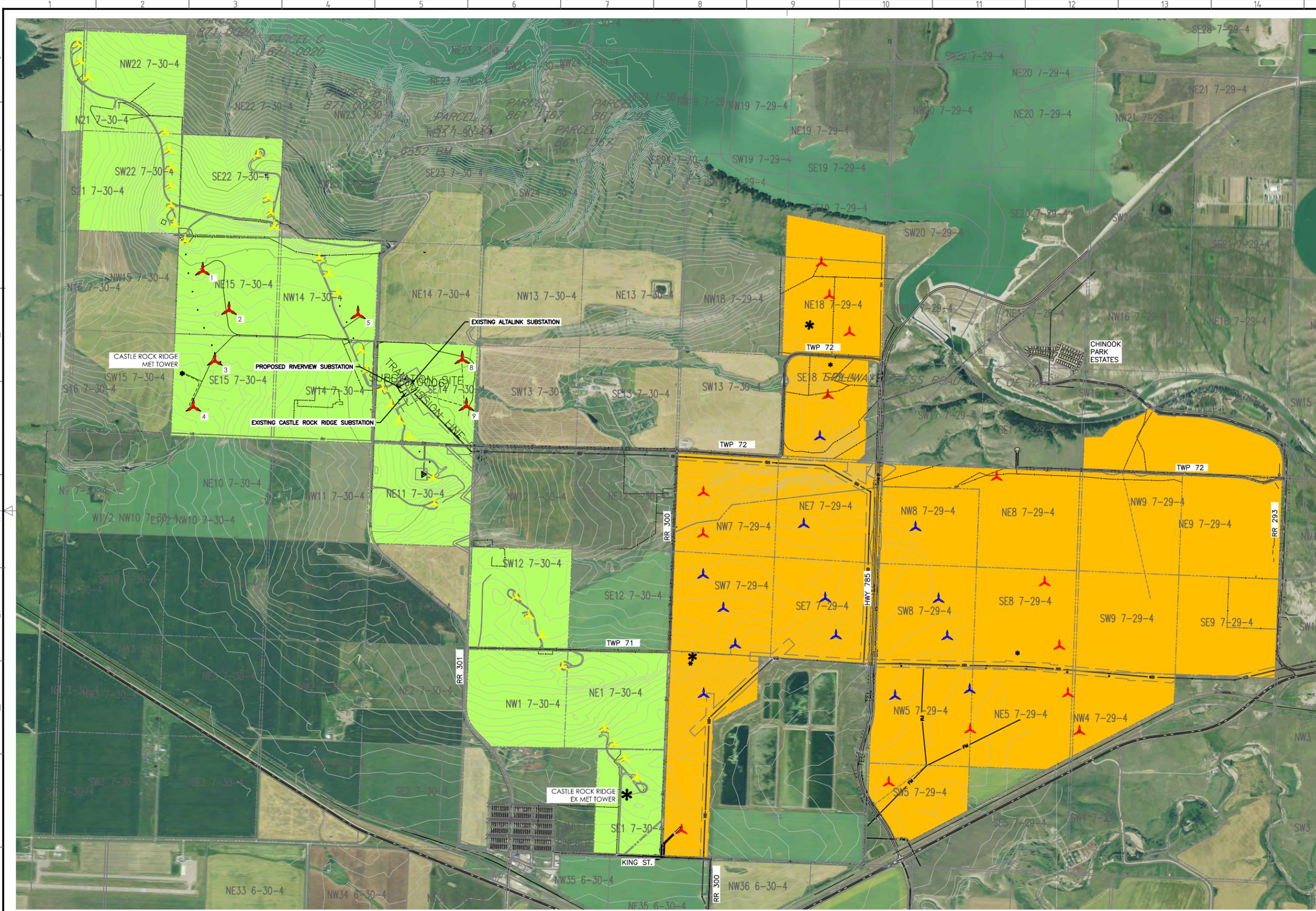
**P:** [403-454-9463](tel:403-454-9463)

**E:** [jmah@solasenergyconsulting.com](mailto:jmah@solasenergyconsulting.com) | **W:** [solasenergyconsulting.com](http://solasenergyconsulting.com)

RENEWABLE ENERGY ~ CLIMATE CHANGE ~ PROJECT & BUSINESS DEVELOPMENT ~ STRATEGIC PLANNING



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- LEGEND**
- RIVERVIEW PROJECT AREA
  - CASTLE ROCK RIDGE PH 1 & 2 PROJECT AREA
  - CONTOUR LINES (5m. MAJOR)
  - PROPOSED RIVERVIEW TURBINES
  - PROPOSED RIVERVIEW TURBINES WITH LIGHTS
  - EXISTING CASTLE ROCK RIDGE TURBINES
  - EXISTING CASTLE ROCK RIDGE TURBINES WITH LIGHTS
  - PROPOSED CASTLE ROCK RIDGE PH2 TURBINES
  - PROPOSED CASTLE ROCK RIDGE PH2 TURBINES WITH LIGHTS

0	2018/03/13	FOR NAV CANADA APPLICATION	S Kirby	J Drain					
REV.	DATE	DESCRIPTION	PREPARED	CHECKED	APPROVED				

PRELIMINARY

NOT FOR CONSTRUCTION

**Stantec**  
 Quarry Park Boulevard SE  
 Calgary AB, Canada T2C 5H9  
 Phone: (403) 252-3436  
 Fax: (403) 252-3464

<b>PROJECT:</b> CASTLE ROCK RIDGE PH 2			
FILE NAME:			
<b>CLASSIFICATION</b>		<b>COMPANY</b>	
ANSI D	SCALE: FULL	PLOT SCALE: 1:15000	SHEET: 1 of 1

**Engineering & Construction**

<b>EGP VALIDATION</b>	
VALIDATED by:	
VERIFIED by:	
COLLABORATORS:	

<b>UTILIZATION SCOPE</b>		<b>TITLE:</b> CASTLE ROCK RIDGE PH 2 WIND FARM NAV CANADA LIGHTING PLAN	
<b>BASIC DESIGN</b>			
EGP CODE			
GROUP	FUNCTION	TYPE	ISSUER
EGP	EECD	25C	AW355341200100
PLANT	SYSTEM	PROGRESSIVE	REVISION

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Project: **Castle Rock Ridge Phase II**

Proponent: **Pincher Creek, L.P., by its general partner Enel Alberta Wind Inc.**

<b>Turbine Information</b>		
<b>Turbine Name</b>	<b>LAT dd mm ss.ssss</b>	<b>LONG -ddd mm ss.ssss</b>
1	49 33 55.38	-113 59 04.70
2	49 33 45.43	-113 58 53.54
3	49 33 32.06	-113 58 58.45
4	49 33 19.87	-113 59 06.31
5	49 33 45.63	-113 58 01.72
8	49 33 35.00	-113 57 19.20
9	49 33 22.82	-113 57 16.77
MET Tower	49 33 28.46	-113 59 11.32

## Appendix P DEPARTMENT OF NATIONAL DEFENSE

The Proponent has submitted the DND application on May 25, 2018 and expects to receive a letter of non-objection for the Project.

# Pincher Creek LP (Enel Alberta Wind Inc.) - Castle Rock Ridge Phase II - Department of National Defence

Jason Mah

Fri 5/25/2018 5:38 PM

To: windturbines@forces.gc.ca <windturbines@forces.gc.ca>;

Cc: Victor.Engel@enel.com <Victor.Engel@enel.com>; Ashley.Smith@enel.com <Ashley.Smith@enel.com>; CRR2@enel.com <CRR2@enel.com>; Paula McGarrigle <Pmcgarrigle@solasenergyconsulting.com>;

📎 2 attachments (5 MB)

Enel - CRR2 - wind-turbine-submission-form V1.0 15MAY2018.xls; 11985-Plan-CRR2-A009-20180514.pdf;

Hello,

On behalf of Pincher Creek, L.P., by its general partner Enel Alberta Wind Inc., I am contacting you with regards to their proposed Castle Rock Ridge Phase II (Project) near Pincher Creek, Alberta. Recommended procedures for consultation with agencies including the DND are outlined in the document, *Technical Information and Coordination Process Between Wind Turbines and Radiocommunication and Radar Systems*, published by the Radio Advisory Board of Canada, and the following webpage: <http://www.rcaf-arc.forces.gc.ca/en/8-wing/aerospace-telecommunications-engineering-support.page>

We would like your input on potential interference between DND radar, radio communications, or flight paths and the Project. The Project is in the design stage and subject to change upon consultation with stakeholders. Attached you will find a map of the Project land and turbine locations, as well as a spreadsheet listing the proposed turbine locations. Coordinates are provided with a datum of NAD83.

The following information is provided to assist you in your analysis:

- Project Name: Castle Rock Ridge Phase II
- Proponent: Pincher Creek, L.P., by its general partner Enel Alberta Wind Inc.
- Number of Turbines: 7
- Hub Height: 82m
- Rotor Diameter: 136m
- Total Height to Blade Tip: 150m
- Blade Material: Fiberglass reinforced epoxy, carbon fibres, and Solid Metal Tip (SMT)

Your response indicating if there will be potential conflicts between your agency and the proposed wind farm is greatly appreciated. If potential conflicts are identified, we would like to discuss possible mitigation measures to address your concerns.

**Jason Mah**, E.I.T., B.Sc. ChE.

Junior Renewable Energy Analyst

**Solas Energy Consulting Inc.**

Suite 119, 2-2009 31 Ave S.W. Calgary, Alberta, T2T1Z5

P: 403-454-9463

E: [jmah@solasenergyconsulting.com](mailto:jmah@solasenergyconsulting.com) | W: [solasenergyconsulting.com](http://solasenergyconsulting.com)



Project: **Castle Rock Ridge Phase II**

Proponent: **Pincher Creek, L.P., by its general partner Enel Alberta Wind Inc.**

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<b>Turbine Name</b>	<b>LAT dd mm ss.ssss</b>	<b>LONG -ddd mm ss.ssss</b>
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8	49 33 35.00	-113 57 19.20
9	49 33 22.82	-113 57 16.77
MET Tower	49 33 28.46	-113 59 11.32

## **Appendix Q ENVIRONMENT AND CLIMATE CHANGE CANADA**

The Proponent has submitted to ECCC on May 25, 2018 and expects to receive a letter of non-objection for the Project.

# Pincher Creek LP (Enel Alberta Wind Inc.) - Castle Rock Ridge Phase II - Environment and Climate Change Canada

Jason Mah

Fri 5/25/2018 5:36 PM

To: Radars Météo / Weather Radars (EC) <ec.radarsmeteo-weatheradars.ec@canada.ca>;

Cc: Victor.Engel@enel.com <Victor.Engel@enel.com>; Ashley.Smith@enel.com <Ashley.Smith@enel.com>; CRR2@enel.com <CRR2@enel.com>; Paula McGarrigle <Pmcgarrigle@solasenergyconsulting.com>;

📎 2 attachments (5 MB)

CRR2 Turbine Locations V1.0 25MAY2018.xlsx; 11985-Plan-CRR2-A009-20180514.pdf;

Hello,

On behalf of Pincher Creek, L.P., by its general partner Enel Alberta Wind Inc., I am contacting you with regards to their proposed Castle Rock Ridge Phase II (Project) near Pincher Creek, Alberta. Recommended procedures for consultation with agencies including Environment and Climate Change Canada are outlined in the document, *Technical Information and Coordination Process Between Wind Turbines and Radiocommunication and Radar Systems*, published by the Radio Advisory Board of Canada.

We would like your input on potential interference between Environment and Climate Change Canada weather radar and the Project. Desktop analysis shows that the closest Environment and Climate Change Canada weather radar, Strathmore, is over 190km away from the Project. As such, we do not anticipate any interference between the radar and wind farm. The Project is in the design stage and subject to change upon consultation with stakeholders. Attached you will find a map of the Project land and turbine locations, as well as a spreadsheet listing the proposed turbine locations. Coordinates are provided with a datum of NAD83.

The following information is provided to assist you in your analysis:

- Project Name: Castle Rock Ridge Phase II
- Proponent: Pincher Creek, L.P., by its general partner Enel Alberta Wind Inc.
- Number of Turbines: 7
- Hub Height: 82m
- Rotor Diameter: 136m
- Total Height to Blade Tip: 150m

Your response indicating if there will be potential conflicts between your agency and the proposed wind farm is greatly appreciated. If potential conflicts are identified, we would like to discuss possible mitigation measures to address your concerns.

**Jason Mah**, E.I.T., B.Sc. ChE.

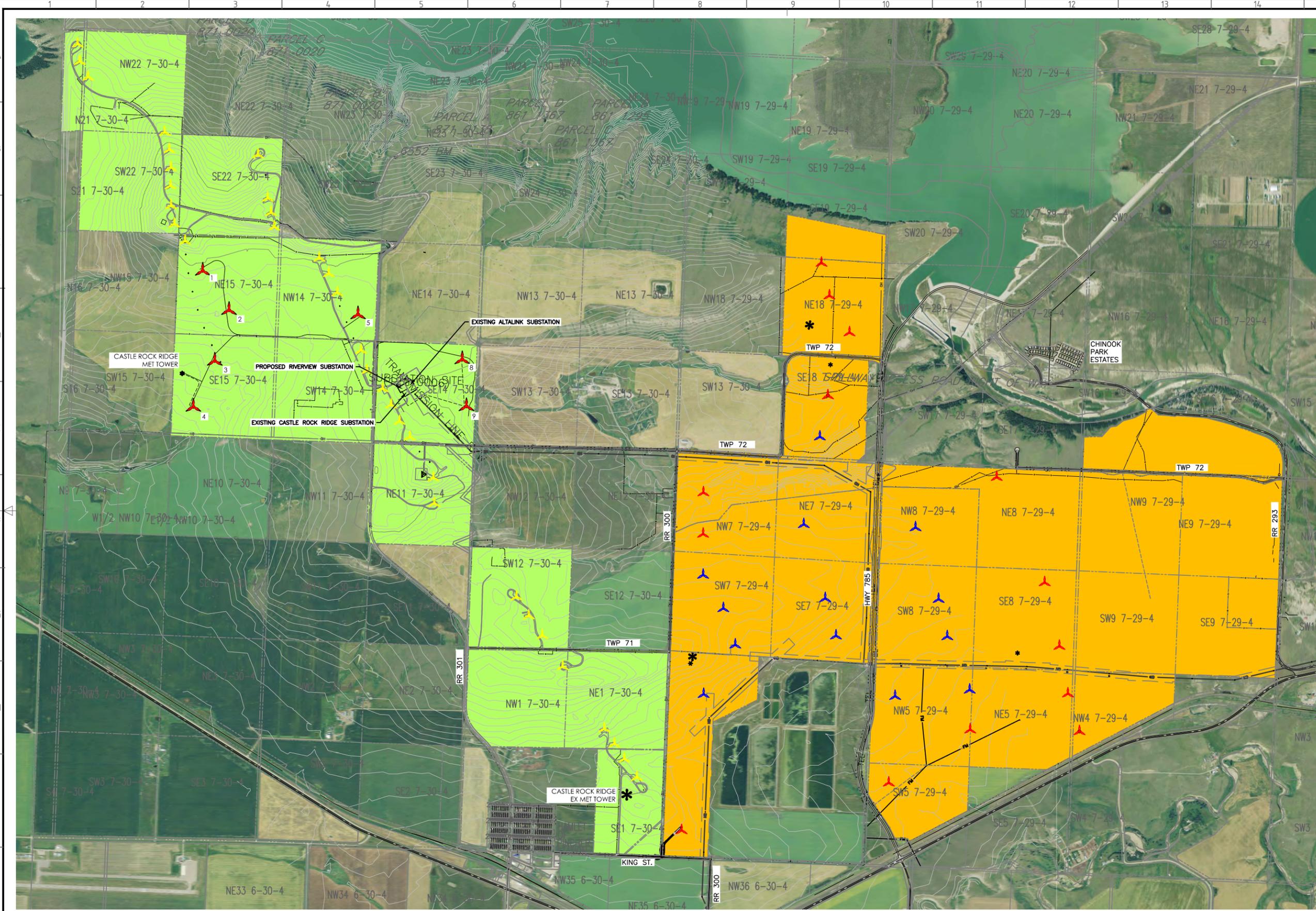
Junior Renewable Energy Analyst

**Solas Energy Consulting Inc.**

Suite 119, 2-2009 31 Ave S.W. Calgary, Alberta, T2T1Z5

P: [403-454-9463](tel:403-454-9463)

E: [jmah@solasenergyconsulting.com](mailto:jmah@solasenergyconsulting.com) | W: [solasenergyconsulting.com](http://solasenergyconsulting.com)



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0	2018/03/13	FOR NAV CANADA APPLICATION	S Kirby	J Drain					
REV.	DATE	DESCRIPTION	PREPARED	CHECKED	APPROVED				

PRELIMINARY

NOT FOR CONSTRUCTION

**Stantec**  
 Quarry Park Boulevard SE  
 Calgary AB, Canada T2C 5H9  
 Phone: (403) 252-3436  
 Fax: (403) 252-3464

PROJECT: <b>CASTLE ROCK RIDGE PH 2</b>			
FILE NAME:			
CLASSIFICATION		COMPANY	
FORMAT: <b>ANSI D</b>	SCALE: <b>FULL</b>	PLOT SCALE: <b>1:15000</b>	SHEET: <b>1 of 1</b>

**Engineering & Construction**

EGP VALIDATION	
VALIDATED by	
VERIFIED by	
COLLABORATORS	

UTILIZATION SCOPE		TITLE: <b>CASTLE ROCK RIDGE PH 2 WIND FARM NAV CANADA LIGHTING PLAN</b>	
<b>BASIC DESIGN</b>			
EGP CODE			
GROUP: <b>EGP</b>	FUNCTION: <b>EECD</b>	PLANT: <b>25C</b>	AW: <b>355341200100</b>

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Project: **Castle Rock Ridge Phase II**

Proponent: **Pincher Creek, L.P., by its general partner Enel Alberta Wind Inc.**

<b>Turbine Information</b>		
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