



# Ashtabula I Wind Energy Center Post-Construction Inspection Report PU-08-032



Prepared for:

## **NORTH DAKOTA PUBLIC SERVICE COMMISSION**

600 E. Boulevard Avenue  
Bismarck, ND 58505-0480

Prepared by:

## **WENCK ASSOCIATES, INC.**

301 1st Street NE, Suite 202  
Mandan, ND 58554  
(701) 751-3370

---

# Table of Contents

---

<b>1.0</b>	<b>EXECUTIVE SUMMARY .....</b>	<b>1-1</b>
<b>2.0</b>	<b>BACKGROUND &amp; SCOPE .....</b>	<b>2-1</b>
2.1	Introduction .....	2-1
2.2	Purpose .....	2-1
2.3	Methods and Scope of Inspection .....	2-1
2.3.1	Project Compliance Items Identified .....	2-1
2.3.2	Document Review .....	2-1
2.3.3	On-Site Inspection .....	2-2
<b>3.0</b>	<b>FINDINGS .....</b>	<b>3-1</b>
3.1	Siting & Location of Facility .....	3-1
3.1.1	Designated Location and Facilities .....	3-1
3.1.2	County/City Regulations .....	3-2
3.1.3	Siting Issues .....	3-2
3.1.4	Land & Agricultural Impacts .....	3-2
3.1.5	Surrounding Community, Public Services, Safety .....	3-3
3.1.6	Turbine Setbacks .....	3-3
3.2	Project Design & Engineering .....	3-3
3.2.1	Capacity .....	3-3
3.2.2	Turbine Specifications .....	3-3
3.2.3	Collection Line & Substation .....	3-3
3.2.4	National Electric Safety Code .....	3-4
3.2.5	As-built Drawings .....	3-4
3.3	Pre-Construction .....	3-4
3.3.1	PSC-Required Documents .....	3-4
3.3.2	Permits and Approvals from Other Agencies .....	3-4
3.3.3	Pre-Construction Conference/Notice of Intent to Start Construction .....	3-4
3.3.4	Engineering Design Drawings and PSC Approval of Modifications .....	3-4
3.4	Cultural Resources .....	3-5
3.4.1	SHPO Concurrence .....	3-5
3.4.2	Cultural Site Avoidance .....	3-5
3.4.3	Reporting .....	3-5
3.5	Natural Resources .....	3-5
3.5.1	USFWS Waterfowl Production Areas .....	3-5
3.5.2	Wildlife .....	3-5
3.5.3	Native Prairie .....	3-6
3.5.4	Wetlands .....	3-6
3.5.5	Reporting .....	3-7
3.5.6	Reclamation & Reseeding .....	3-7
3.5.7	Tree & Shrub Mitigation .....	3-7
3.6	Construction, Reclamation & Soils .....	3-7

---

## Table of Contents (Cont.)

---

3.6.1	Construction Management & Safety.....	3-7
3.6.2	Erosion & Sedimentation .....	3-8
3.6.3	Minimization of Impacts .....	3-8
3.6.4	Utility Lines.....	3-8
3.6.5	Noxious Weeds.....	3-8
3.6.6	Reclamation & Roads .....	3-9
3.6.7	Repairs & Waste.....	3-9
3.7	Operation.....	3-9
3.7.1	Safety & Record-keeping.....	3-9
3.7.2	Maintenance .....	3-9
3.7.3	Public Contact & Safety.....	3-10
<b>4.0</b>	<b>ISSUES TO RESOLVE AND RECOMMENDATIONS.....</b>	<b>4-1</b>
4.1	Project Specifications Needing Written Verification .....	4-1
4.2	Erosion Control & Maintenance .....	4-2
4.3	Noxious Weed & Vegetation Control.....	4-2
4.4	Reseeding Methods .....	4-2
4.5	Wildlife Protection Measures & Monitoring .....	4-2
4.6	Tree & Shrub Replacement.....	4-3
4.7	Staging/Laydown Area Reclamation.....	4-3
<b>5.0</b>	<b>CONCLUSIONS .....</b>	<b>5-1</b>
<b>6.0</b>	<b>REFERENCES .....</b>	<b>6-1</b>
<b>7.0</b>	<b>SIGNATURES.....</b>	<b>7-1</b>

---

# Table of Contents (Cont.)

---

## **TABLES**

Table 2-1: Project Specifications with Written or Site Verification Information ..... 2-3

## **FIGURES**

Figure 1: Project Area and Field Observations Map

## **APPENDICES**

Appendix A: Photographs

Appendix B: Field Observation Points

---

# 1.0 Executive Summary

---

The North Dakota Public Service Commission (PSC) retained Wenck Associates, Inc. (Wenck) to complete a construction inspection of the Ashtabula I Wind Energy Center (Project) in Barnes County, North Dakota (ND) owned and operated by Ashtabula Wind, LLC, an operating division of NextEra Energy Resources, LLC (NextEra). Construction for the Project was completed in December 2008. Wenck reviewed all Project documents to identify those aspects which required compliance and visually inspected the Project area on November 19, 2012.

The Project was well-maintained and appeared to have been constructed as planned with numerous efforts to minimize impacts. However, there were several non-critical issues that may need to be resolved for the Project to be considered complete and in full compliance, including 1) written verification of some items, 2) minor erosion control and maintenance, 3) noxious weed and vegetation control, 4) clarification of reseeding seed mix, 5) verification of certain wildlife protection measures, 6) tree and shrub replacement, and 7) reclamation of the staging/laydown area. Wenck expects follow-up actions taken by NextEra to address these particular issues can be corroborated in writing or photos and will not require a subsequent site visit. Wenck recommends the PSC take the following steps to resolve these issues.

## **Recommended Action Steps**

### **→Request Now**

- Written verification of “necessary” items (refer to list in Section 4.1).
- Control of noxious weed outbreaks (Section 4.3).
- Increased frequency of vegetation and weed control on gravel pads (Section 4.3).
- Confirmation of certain planned wildlife measures or justification of why deemed unnecessary (refer to list in Section 4.5).

### **→Notify Now**

- Continue regular maintenance of minor erosion issues (Section 4.2): edges of access roads, ruts on roads; gravel pads around the turbine bases.

### **→Review Internally, Clarify, Then Request if Needed**

- Several “potential” items may need written verification, but the PSC should review first since some of them may not be needed or may be best verified in some other way (refer to list in Section 4.1).
- For reseeding of disturbed areas, determine whether NRCS recommendations should continue to be followed, which may include non-native species, or whether a native seed mix should be required based on requests from other agencies (Section 4.4).

### **→ Expect Later, Request if Needed**

- 2013: Tree and Shrub Survival Report; confirmation that erosion in substation ditch is repaired.
- 2014: Tree and Shrub Survival Report; satisfactory revegetation in substation ditch.
- Reclamation of staging/laydown area (Section 4.7).

---

## 2.0 Background & Scope

---

### 2.1 INTRODUCTION

The Ashtabula I Wind Energy Center (Project) was completed in 2008 in Barnes County, North Dakota, about seven miles northeast of the town of Valley City (**Figure 1**). The Project is operated by Ashtabula Wind, LLC (Ashtabula Wind), a subsidiary of NextEra Energy Resources, LLC (NextEra). The Project had a proposed capacity of 199.5-megawatts (MW) comprised of 133 turbines. The Project is under the jurisdiction of the North Dakota Public Service Commission (PSC), which issued its Findings of Fact, Conclusions of Law, and Order in Case No. PU-08-032 on May 30, 2008, granting a Certificate of Site Compatibility for Energy Conversion Facility, Certificate No. 7, for the Project.

### 2.2 PURPOSE

The North Dakota Energy Conversion and Transmission Facility Act (North Dakota Century Code Chapter 49-22) authorizes the Public Service Commission to determine that the location, construction, and operation of jurisdictional energy conversion and transmission facilities will produce minimal adverse effects on the environment and the welfare of citizens of North Dakota. Post-construction inspections ensure that such projects are constructed in compliance with the siting laws (North Dakota Century Code Chapter 49-22) and rules (North Dakota Administrative Code Article 69-06) and the applicable Commission Findings of Fact, Conclusions of Law, and Order (Order). The North Dakota PSC retained Wenck Associates, Inc. (Wenck) to complete a construction inspection of the Project.

### 2.3 METHODS AND SCOPE OF INSPECTION

#### 2.3.1 Project Compliance Items Identified

Wenck identified a list of “Project Specifications”, which the company was obligated or responsible to follow and that can be verified either in written documentation or by an on-site inspection. These items were taken from 1) siting laws and rules, 2) Project activities or specifications proposed in the Application, 3) Project plans described in the Findings of Fact, 4) Orders, and 5) recommendations by other agencies. These Project specifications are listed in Table 2.1 within 7 categories: Siting & Location; Project Design & Engineering; Pre-Construction; Cultural Resources; Natural Resources; Construction, Reclamation & Soils; and Operation.

#### 2.3.2 Document Review

Wenck staff reviewed publicly-available Project documents in the PSC Online Case Search (ND PSC 2013) to find written verification of compliance for the Project specifications listed in Table 2.1. If written verification was filed, the findings are described in Section 3 and the source and name of the documentation is listed in Table 2.1, Column 3 (Written Verification). Shaded boxes in the table represent Project specifications that are potentially non-compliant because they have no written verification.

### 2.3.3 On-Site Inspection

Sara Simmers, Wenck botanist and natural resource scientist, visited the Project site on 19 November 2012. Shawn Neustel, NextEra Wind Site Manager, arranged the site visit. Eric Costello, NextEra Wind Technician, accompanied Wenck staff during the site visit and assisted with navigation, pointed out problem areas, and answered questions.

The site was inspected visually using a combination of driving and walking selected portions of the Project area, including the substation, utility line routes, access roads and wind turbines. Digital photographs (Canon Power Shot SD1300 IS, 12 megapixel) were taken showing typical Project infrastructure and documenting problem areas (**Appendix A**). Geographic coordinates were recorded at observation points or potential problem areas using a handheld Global Positioning System (GPS) (Garmin GPSMAP 60CSx; <10m accuracy; NAD83 datum) (**Figure 1; Appendix B**).

If on-site inspection of a Project specification was completed, the findings are described in Section 3 and referenced in Table 2.1, Column 4 (Site Verification). Shaded boxes in the table represent Project specifications that are potentially non-compliant based on site verification.

**Table 2-1: Project Specifications with Written or Site Verification Information**

Source of Project Specification	Description of Project Specification	Written Verification*	Site Verification*
<b>SITING &amp; LOCATION</b>			
Findings of Fact 2, 4, 5; Order 2, 3; App. p. 6, 19, 23	Designated location in Barnes County, ND. Associated facilities to include access roads, underground collection and feeder lines, meteorological towers, a collection substation, and an operations and maintenance building.	None.	Section 3.1.1
Findings of Fact 31; Order 4	Compliance with county/city land use, zoning, rules, regulations, ordinances. Conditional Use Permit (CUP) and Variance from Barnes Co.	Docket 25-07, Barnes Co. CUP and Variance	N/A
ND Admin. Code Article 69-06-08; Findings of Fact 17, 20, 21, 24, 25; App. p. 10-16	Siting Criteria analysis – exclusion, avoidance, selection, policy. Avoidance areas: historical resources, woodlands, wetlands. Minor visual impacts to recreation at Lake Ashtabula. No impact on Selection Criteria. Expected to meet Policy Criteria.	Docket 5, Application	Section 3.1.3
Findings of Fact 18, 28; App p. 20, 42	Total land disturbance maximum 152 acres. Project will impact approx. 25 acres of agricultural production. Disturbance to prime farmland of limited acreage (maximum 14 acres). No impacts to quality of cropland anticipated. Soil compaction addressed as necessary.	None.	Section 3.1.4
Findings of Fact 26; App. p. 30	No adverse impacts foreseen to surrounding community, public services, safety. Expected economic benefit.	None.	Section 3.1.5
Findings of Fact 27, 30; App. p. 16, 19, 36; NDDA (3-12-2008)	Turbine setbacks: 1,400ft. from occupied residence; average noise levels should not exceed 50dB standard and electromagnetic fields will be at background levels. 440ft. from existing transmission lines, roads, and railroads. 130ft. from property boundaries. NDDA request: setbacks or adjacent landowner compensation	Docket 18, updated Application Appendix C, Figure 8	Section 3.1.6
<b>PROJECT DESIGN &amp; ENGINEERING</b>			
Findings of Fact 6, 7; Order 3; App. p. 6, 10	Authorized up to 200MW capacity; up to 133 1.5MW turbines. Otter Tail Corporation will own 32 turbines (48MW).	Docket 277, Plan of Day 11-15-2008, 32 turbines for Otter Tail. Docket 306, Plan of Day 12-19-2008, 99 turbines for Ashtabula	Section 3.2.1
Findings of Fact 8, 9, 10, 16; App. p. 18, 21, 22	GE 1.5MW turbines, 80m hub height, 77m rotor diameter. Turbines with concrete foundation, lighting according to FAA, control panel in turbine base, pad-mounted transformer steps down to collection lines. Turbines to have SCADA and lightning protection.	N/A	Section 3.2.2
Findings of Fact 11; App p. 18, 19, 22, 23	Collection line system delivers electricity to substation, stepped up to new 230kV transmission line.	None.	Section 3.2.3
ND Century Code Ch. 49-	Compliance with National Electric Safety Code.	None.	N/A

Source of Project Specification	Description of Project Specification	Written Verification*	Site Verification*
22-24; Findings of Fact 13; Order 8; App. p. 23			
Order 31	As-built engineering design drawings within 3mo. after construction complete.	None.	N/A
	<b>PRE-CONSTRUCTION</b>		
ND Century Code Ch. 49-22-04; ND Admin. Code Article 69-06-02	Ten-year plan (submit before July 1)	Docket #1, Case No. PU-11-637, 2011 Ten-year plan	N/A
ND Century Code Ch. 49-22-07	Certificate of site compatibility or route permit	Docket 27, Certificate 7, 5-30-2008	N/A
ND Century Code Ch. 49-22-07.1; ND Admin. Code Article 69-06-03	Letter of intent	Docket 1, Letter of Intent	N/A
ND Century Code Ch. 49-22-08; ND Admin. Code Article 69-06-04	Application for a certificate of site or corridor compatibility	Docket 5, Application; Docket 18, updated Application figures	N/A
Findings of Fact 32; Order 4; App. p. 60-61	Permits and approvals from other agencies. Provide copies.	Docket 25-02, 25-03, original FAA Determinations; Docket 25-07, Barnes Co. CUP and Variance; Docket 308, Wetland Report/USACE Determinations	N/A
Order 5, 6	Conduct pre-construction conference. Provide notice of intent to start construction.	None.	N/A
Order 30	Provide engineering design drawings of surveyed locations prior to construction. Obtain approval from PSC prior to any changes in those locations.	No engineering design drawings on file. No changes requested on file.	N/A
	<b>CULTURAL RESOURCES</b>		
Findings of Fact 21; ND SHPO (1/25/2008)	Obtain SHPO concurrence of archeologist's report. SHPO initially requested Class I Cultural Resource Survey.	Docket 5, Application Appendix C, Class I Survey Report; Docket 25-09 Class III Cultural Resource Inventory. No SHPO concurrence letters on file.	N/A
Findings of Fact 21; App. p. 39	Avoidance of all identified sites potentially eligible for National Register of Historic Places. Avoidance of all cultural resource features during construction.	Docket 63, Plan of Day 7-18-2008.	Section 3.4.2

Source of Project Specification	Description of Project Specification	Written Verification*	Site Verification*
Order 10	Report discovery of cultural, archeological, historic sites. Construction stopped, SHPO consulted and clearance required, report to Commission filed.	None reported to date.	N/A
<b>NATURAL RESOURCES</b>			
Findings of Fact 19; App. p. 19, 53	USFWS Waterfowl Production Areas buffer of 0.25 miles. Exception is access road and collection line for Turbine 128; USFWS concurred no affect to WPA.	None.	Section 3.5.1
Findings of Fact 29; App. p. 52-54; USFWS (4-10-2008)	Minimal impact expected to avian and bat species due to turbine collisions. Mitigation measures for wildlife: burying electric lines when possible, avoiding construction during sensitive times, siting away from high use habitat (wetlands and woodlands) when possible, turbines with monopole towers, minimal lighting (according to FAA). Spring pre-construction avian survey to be completed. USFWS requests: no overhead power lines or bird-safe designs, avoid construction Feb 1-July 15	Docket 31, Plan of Day 6-23-2008, start construction; Docket 306, Plan of Day 12-19-2008, end construction. No spring pre-construction avian survey on file.	Section 3.5.2
Findings of Fact 32; App. p. 49; NDGF (9-24-2007); USFWS (4-10-2008); NDPR (2-6-2008)	Minimal disturbance of native prairie. Concerns of NDGF and USFWS. NDPR recommends avoiding occurrences of listed plant species of concern and critical habitats.	Docket 25-10, Native Prairie Summary	Section 3.5.3
App. p. 16, 47-49, 53-54; NDGF (9-24-2007); USFWS (4-10-2008)	Most wetlands avoided through siting; permits obtained through USACE if unavoidable. Plan to avoid all wetlands within USFWS wetland easements or obtain appropriate permit. Detailed wetland inventory to be completed. NDGF, USFWS concern. USFWS request: avoid/minimize impacts to USFWS easements.	Docket 25-08, Wetlands Delineation Summary; Docket 308, Wetland Delineation Report; Dockets 41, 43, 61, 237, Plans of Day, examples of notes/photos of wetlands fenced, marked	Section 3.5.4
Order 9; Findings of Fact 22, 32; App. p. 27, 53	Wildlife Response Reporting System implemented during routine maintenance. Report presence of critical habitat of T+E species, or bald or golden eagles.	None reported to date.	N/A
Order 13; App. p. 49, 54; USFWS (4-10-2008); NDPR (2-6-2008)	Reclamation, fertilization, and reseeding according to USFWS and NRCS (or landowner if approved). NDPR, USFWS request: reseed with native species.	None.	Section 3.5.6
Order 16; App. p. 54	Trees replaced with saplings at least two years old at 2:1 ratio. Landowners given option for planting or to waive. Replacements inspected for 3 years; report by Oct. 1.	Docket 311, Mitigation Plan; Docket 315, 2011 Planting Report; Docket 316, 2012 Survival Report	Section 3.5.7
<b>CONSTRUCTION, RECLAMATION &amp; SOILS</b>			
App. p. 7, 24; Order 6, 7, 12	EPC contractor retained for construction management. Construct and operate as described in Application, at hearing, in late-filed exhibits, and in	Docket 224, Plan of Day 10-13-2008, No work on collection due to	N/A

Source of Project Specification	Description of Project Specification	Written Verification*	Site Verification*
	accordance to safety requirements. Construction suspended during adverse weather conditions. Provide weekly construction reports.	wet conditions. Docket 31-86, 88-302, 304-306, Plans of Day	
Findings of Fact 23; App. p. 44, 48, 54; NDDH (1/31/2008)	Soil erosion minimized by use of BMPs during and after construction to protect groundwater and soils/topsoils. NDDH concerns: minimize fugitive dust, degradation of waterways, storm water management, noise.	Dockets 32, 51, 61, 74, 224, 237, Plans of Day, example of notes/photos for SWPPP inspections, erosion control structures, silt fence installation, BMP repairs and removal	Section 3.6.2
Order 19, 27; App. p. 44	Staging areas not located on cultivated land unless negotiated with landowners. Topsoil segregated and replaced to minimum 12in.	Docket 65, Plan of Day, has photo of road construction showing segregation of topsoil	Section 3.6.3
Order 26, 28	Utility line crossings of graded roads bored unless permitted to open cut. Utility lines buried to minimum 48in.	Dockets 62, 64, 66, 67, Plans of Day examples of notes/photos of boring equipment and boring locations	Section 3.6.4
App. p. 54	Noxious weed management during construction and operation.	None.	Section 3.6.5
Order 11, 21	Pre-existing roads restored to satisfactory condition to accommodate previous use. Temporary roads restored to original condition. Area around each turbine restored promptly.	Docket 209, 247, Plans of Day, note about backfill at turbines, starting of reclamation	Section 3.6.6
Order 17, 18, 20; NDSWC (2-15-2008)	Repair/replace all damaged fences and gates. Repair/replace damaged drainage tile. Waste removed & disposed regularly. NDSWC request: waste disposed properly.	None.	Section 3.6.7
<b>OPERATION</b>			
Order 7, 24, 33	Construct and operate as described in Application, at hearing, in late-filed exhibits, and in accordance to safety requirements. Extraordinary events (e.g. tower/turbine failure, injuries, fatalities of T & E species, wildlife fatality events) reported within 5 business days. Maintain records of compliance with Order and Certificate of Site Compatibility.	None reported to date.	Section 3.7.1
Order 14, 20; App. p. 25-27	Reclamation and maintenance throughout life of facility. Waste removed & disposed regularly.	None.	Section 3.7.2
Order 22, 23, 25, 29; App. p. 37, 38	Educational materials, as requested, and notification of possible dangers to landowners. Safety measures for traffic control or to restrict public access. Procedure for handling complaints. Cooperation with landowners/residents to mitigate television and radio interference.	None.	Section 3.7.3

**\*Note: Shaded boxes represent non-compliance or potential non-compliance issues.**

---

## 3.0 Findings

---

### 3.1 SITING & LOCATION OF FACILITY

#### 3.1.1 Designated Location and Facilities

The Project was built as proposed in the designated project area described in the Application and Order in Barnes County, North Dakota (**Figure 1**). Wenck observed 131 wind turbines (two fewer than proposed); 32 turbines were owned by Otter Tail Corporation and 99 turbines were owned by Ashtabula Wind/NextEra. Associated facilities observed during the site visit included an electrical substation, the Operations and Maintenance (O&M) building, the staging/laydown grounds adjacent to the O&M building, access roads, and markers indicating the location of underground electrical and feeder lines (**Appendix A; Appendix B**).

Several differences in the latest proposed project layout (dated April 2008) on file compared to the built facility were noted. These include the following:

- Adjustments made to avoid wetlands: access road for Turbines 1-4; access road between Turbines 14 and 15; access road for Turbines 17-21; access road for Turbines 33-31; access road for Turbines 63-65; access road between Turbines 74-76; proposed access road between Turbines 85 and 86 was not built; access road between Turbines 89 and 90; entrance to access road to Turbines 98-101; access road for Turbines 114-121; access road for Turbines 125-131; Turbine 93 and access road leading to it from the east appeared to be adjusted slightly south.
- None of the Turbine Alternates 1-8 were built.
- North end of access road for Turbine 5-7 was proposed to connect to State Hwy 26 (15<sup>th</sup> St SE), but the connection segment was not built.
- Access road for Turbines 8-10 went straight west from 121<sup>st</sup> Ave SE, then straight south past Turbines 9 and 10, before angling to Turbine 8, rather than leaving the main road diagonally.
- Entrance to Turbines 11 and 12 was adjusted slightly west from proposed route.
- Entrance to access road to Turbines 38-34 was adjusted south to run between two fields.
- The west end of the access road for Turbines 33-31 was proposed to connect to 121<sup>st</sup> Ave SE but was not built.
- Access road from Turbines 39-46 and from Turbines 50-52 was adjusted in several areas, presumably to avoid two cultural sites and for engineering reasons on the rolling upland terrain; access road entrance northeast of Turbine 57 made a straight north connection to County Road 6 rather than at the proposed angle across drainages.
- A segment of access road was added to connect Turbines 58 and 59.
- Access road connection to 20<sup>th</sup> St SE from Turbine 73 was straightened.
- Access road between Turbines 79 and 80 was adjusted south and east from proposed diagonal route.
- Road to Turbine 86 was straightened to run west from County Road 27.
- Entrance to road for Turbines 87-90 was adjusted south to follow quarter-section line.
- Turbine 104 was moved further east from proposed location; associated access road was adjusted south.

- Access road was adjusted to diagonal between Turbines 106 and 107.
- Access road south of Turbines 109 was adjusted west at a diagonal.
- Access road entrance to Turbines 113-109 was adjusted south at its connection to County Road 27 to avoid a shared intersection with a farmyard/residence to the east.
- Entrance to access road for Turbines 122-124 was adjusted west to align between fields.
- Several minor adjustments were made in underground collection line routes. None of the changes amounted to significant differences in the area of disturbed land or impacts. In many cases revisions eliminated indirect routes and reduced impacts.
- An approximately 20 acre portion of the staging/laydown area east of the access road to Turbines 63-65 was not built.

These changes were due to final decisions of planned/alternate turbines, adjustments in access roads, and micrositing adjustments in turbine locations. It is not clear whether the adjustments in turbine locations were allowed within the issued Certificate of Site Compatibility. There was nothing on file to indicate changes had been submitted for approval by the PSC. Changes in structure locations for the transmission line were on file but not for the wind turbines.

### **3.1.2 County/City Regulations**

A Conditional Use Permit (CUP) and variance for wind turbine heights from Barnes County was on file (Docket #25-07).

### **3.1.3 Siting Issues**

Siting criteria were analyzed in detail in the Application for the Project (Docket #5). Wenck confirmed during the site inspection that exclusion and avoidance areas were avoided as described in the Application, to the extent possible. Historical/cultural resources were avoided (see Section 3.4.2). No natural woodlands were impacted. Trees were removed from shelterbelts; mitigation for this loss is in progress (see Section 3.5.7). Wetlands were avoided to the extent possible (see Section 3.5.4); several adjustments were made to access roads to avoid wetland disturbances. Wenck also confirmed that impacts to selection and policy criteria were considered and kept at a minimum.

### **3.1.4 Land & Agricultural Impacts**

The Project was built as proposed, except for relatively minor siting adjustments (see Section 3.1.1). A few of the adjustments in access roads and collection lines were outside of the estimated construction limits and right-of-ways from the latest filed proposal maps. However, it appeared that the extent of construction and disturbance were within the maximum acreages estimated in the Application. Changes from the proposed facility (see Section 3.1.1) would not have greatly altered the extent of disturbance, and in many instances, such as where portions of access roads were not built and where a large acreage of the laydown/staging area was not built, the amount of area disturbed was actually reduced. Crop production did not appear to be reduced surrounding the turbines and access roads or along collection line routes which went through fields (**Appendix A, Photos 6-12, 15, 17, 19**), indicating that topsoil replacement and soil compaction were satisfactory. The NextEra staff noted that any issues or landowner concerns related to agriculture or cropland are addressed promptly to maintain good rapport with the community. During the site visit, an issue with a landowner was reported by NextEra staff; the landowner had tilled through the gravel pads of Turbines 125-127 (**Appendix A, Photo 11**), which was against the lease agreement terms.

### **3.1.5 Surrounding Community, Public Services, Safety**

There were no indications during the site inspection that the surrounding community or public were being impacted negatively due to the operation and infrastructure of the wind facility. All turbines were placed along access roads which spurred from main public roads; roads were safe and had appropriate signage (**Appendix A, Photos 12, 15, 17**). The wind facility provides jobs for several people who reside in nearby towns.

### **3.1.6 Turbine Setbacks**

Wenck verified during the inspection that turbines were built at least 1,400 feet from occupied residences. There were two exceptions from what could be ascertained from the on-site and GIS analysis, 1) an occupied structure in the NE ¼ of the SE ¼ of Section 28, T143N, R57W, was about 1300ft west of Turbine 14, 2) an occupied structure in the SW ¼ of the SE ¼ of Section 9, T142N, R57W, was about 1200ft southeast from Turbine 76 and about 1160ft southeast from Turbine 75. There was no written evidence of agreements with the landowners filed with the PSC, though presumably there is some sort of agreement in place. Wenck recommends verification of the agreement or setback be obtained.

NextEra proposed a setback of 440ft from existing transmission lines, public roads, and railroads and a setback of 130ft from property boundaries. These setback distances were verified and followed. It is not clear whether setbacks from non-participating landowner property were implemented, as requested by the ND Agricultural Commissioner during the Application period for the Project, though this concern is not an enforceable one.

## **3.2 PROJECT DESIGN & ENGINEERING**

### **3.2.1 Capacity**

The Project was authorized to build up to 133 1.5MW turbines for a total of 199.5 MW capacity. The Plan of the Day for 11-15-2008, which was the final construction account for the Otter Tail-owned turbines, documented that 32 turbines were installed (Docket #277), and the Plan of the Day for 12-19-2008, which was the final construction account for the Ashtabula Wind turbines, documented that 99 turbines were installed (Docket #306). The total built turbines was 131, at a maximum of 196.5 MW capacity, which was within permitted capacity. The 131 turbines were inspected during the site visit (**Appendix A; Appendix B**).

### **3.2.2 Turbine Specifications**

All turbines were constructed as specified, 1.5 MW, 80 m hub height, 77 m rotor diameter. Each turbine had a concrete foundation, a control panel in the tower base, a pad-mounted transformer, and lightning protection (**Appendix A, Photos 8, 29**). Turbines were connected to a SCADA system, observed in the O & M Building control area. Lighting was not confirmed since the inspection took place during daylight hours but is assumed to be in compliance with the FAA.

### **3.2.3 Collection Line & Substation**

Several points along the collection line system were observed and it appeared to be constructed generally where proposed (**Appendix B**). There were several locations where the collection line route was different from the latest proposed route on file. These changes did not appear to increase impacts and they were not outside of the scope of the Project as understood by review of the Application and Order. Points where the collection line were bored under major roads were observed and no concerns

were noted (**Appendix A, Photos 5, 26**). Markers were in place. The collection line tied into a 230kV transmission line at the new substation, as proposed (**Appendix A, Photo 5**).

### **3.2.4 National Electric Safety Code**

There was no written verification or certification of compliance with the National Electric Safety Code.

### **3.2.5 As-built Drawings**

No as-built engineering design drawings were on file. Construction of the Project was completed in December 2008. Wenck recommends that the as-built drawings, signed and dated by a Registered Land Surveyor, be submitted to the PSC.

## **3.3 PRE-CONSTRUCTION**

### **3.3.1 PSC-Required Documents**

A letter of intent was received January 14, 2008 (Docket #1). An Application for a Certificate of Site Compatibility was submitted March 24, 2008 (Docket #5), with updated figures submitted April 25, 2008 (Docket #18). Certificate of Site Compatibility 7 was issued on May 30, 2008 (Docket #27). A ten-year plan was on file for Ashtabula I under case PU-11-637, submitted subsequent to this Project in 2011.

### **3.3.2 Permits and Approvals from Other Agencies**

Several permits and approvals were identified in the Application as potentially required for the Project (Application p. 60-61) and an updated table of required permits was submitted as a late-filed exhibit (Docket #25-01). Federal approvals submitted to the PSC were the FAA Determination of No Hazard to Air Navigation for an earlier Project layout in February 2008 (Docket #25-02), along with resubmittal forms of a revised Project layout in April 2008 (Docket #25-03), however the results of the second determination from the FAA were not on file. The final wetland delineation report included justification for no impacts to USACE jurisdictional wetlands (Docket #308).

Several State permits which were going to be applied for once the Certificate was received from the Commission were not filed with the PSC once obtained. These include the ND Department of Health (NDDH) NDPES Permit, the NDDH Septic Tank and Drainfield Permit, the ND Highway Patrol Overheight/Overweight Permit, the ND Department of Transportation (NDDOT) Road Approach/Access Permit, the NDDOT Utility Permit (Docket #98).

A Conditional Use Permit (CUP) and variance for wind turbine heights from Barnes County was on file (Docket #25-07). Other local permits from Barnes County that were not on file were a Haul Road Agreement and a Utility Permit.

### **3.3.3 Pre-Construction Conference/Notice of Intent to Start Construction**

No records of a pre-construction meeting were on file and there was not a notice of intent to start construction on file.

### **3.3.4 Engineering Design Drawings and PSC Approval of Modifications**

There were no engineering design drawings on file and there were no notifications to modify the facility filed to date. Changes in structure locations for the transmission line and PSC approval were on file but not for the wind turbines (Docket #87). It is not clear whether the adjustments in turbine locations (refer to Section 3.1.1) were beyond the scope of the issued Certificate of Site Compatibility.

## 3.4 CULTURAL RESOURCES

### 3.4.1 SHPO Concurrence

A Class I Cultural Resource Survey Report and a Class III Cultural Resource Inventory Report for the Project, both requested by the ND SHPO, were on file (Docket #5, Application, Appendix C; Docket 25-09, late-filed exhibit). However, no SHPO concurrence letters regarding these reports were provided to the PSC.

### 3.4.2 Cultural Site Avoidance

Two prehistoric stone feature sites were documented from the archeology survey in April 2008 for the Project area (Docket #25-09, Class III Cultural Resources Report). These sites were deemed potentially eligible for listing and required avoidance. These features were located on the string for Turbines 39-57 in Ashtabula and Grand Prairie Townships (T142N, R58W and R57W). The Application described measures that would be taken to avoid the features. The sites were apparently fenced off during construction, as documented in a photo on a Plan of the Day report (Docket #63, Plan of Day for 7-18-2008) and the access roads had been adjusted to avoid the sites. Wenck also verified during the site inspection that the potentially eligible cultural sites were avoided by Project facilities (**Appendix A, Photo 20**). Two isolated finds and one historic/architectural site were also documented but were deemed not eligible for NRHP listing and no avoidance was necessary.

One previously recorded archeological site lead, a potential effigy mound, was within the Project area including the location and access road for Turbine 131; it was determined it would be impacted by the Project but that the site was considered destroyed by plowing and so would not have to be avoided (**Appendix A, Photo 6**). One previously recorded architectural site lead, a cemetery along a collection line in the SE  $\frac{1}{4}$  of the SW  $\frac{1}{4}$  of Section 9, Grand Prairie Township, was within the survey area but was outside of the area of Project construction (**Appendix A, Photo 16**).

### 3.4.3 Reporting

No new discoveries of cultural, archeological, or historic sites have been reported to the PSC to date. Presumably no new sites were encountered during construction of the Project.

## 3.5 NATURAL RESOURCES

### 3.5.1 USFWS Waterfowl Production Areas

A buffer of 0.25 miles was proposed for a setback from several USFWS Waterfowl Production Areas (WPAs) within the Project area. Findings of Fact #19 for the Project described an exception for the access road and collection line for Turbine 128 which were within the buffer; it was determined there would be no impact to the WPA and the Findings of Fact stated the USFWS concurred. There was no record of this concurrence on file. Wenck verified through the on-site and GIS analysis that Project infrastructure was beyond 0.25 miles from the WPAs, with the exception described above.

### 3.5.2 Wildlife

Measures were proposed to minimize impacts to wildlife in the Project area and Wenck verified several of these measures. Collection lines were buried to avoid bird collisions (**Appendix A, Photos 5, 26**), though overhead electric transmission lines were necessary for the Project. Where overhead lines were necessary, the poles appeared to be perch-resistant, but no bird diverters were visible on the wires (**Appendix A, Photos 1, 4, 5**). Wetland and woodland habitat impacts were avoided by siting and adjusting routes as much as possible (**Appendix A, Photos 9, 13, 14, 28, 29**) (also refer to Section 3.1.1).

The Plans of the Day accounts of construction documented that majority of construction timing avoided the spring nesting season (Feb 1-July 15) since it began June 23, 2008 (Docket #31) and ended December 19, 2008 (Docket #306). However the period from June 23 to July 15 did overlap with the season of high wildlife use of the Project area. Plans of the Day also documented that environmentally sensitive areas were marked and monitored and that environmental awareness was reviewed with all crews and subcontractors throughout construction (example Docket #41, Plan of Day 7-2-08). Turbines were monopole towers (**Appendix A, Photo 7**).

Some measures recommended by the USFWS were not implemented. MET towers were not self-standing; some had bird deterrents on the guy wires to help prevent bird collisions (**Appendix A, Photo 27**), though some did not (**Appendix A, Photo 25**).

The Application stated an additional pre-construction avian survey was going to be completed in the Spring 2008 for the Project and that the report would be filed once complete, but this report has not been filed with the PSC.

### **3.5.3 Native Prairie**

Most of the turbines were placed in cultivated lands. However, in the final Project configuration, native prairie was disturbed at 12-13 turbines (Turbines 13, 37, 39, 40, 41, 42, 43, 44, 51, 66, 67, 68, possibly 109), along with associated access roads (**Appendix A, Photos 21, 23**) (also see Docket #25-10, Native Prairie Summary). NextEra had considered avoidance of native prairie during the siting process (Docket #5, Application) and it appeared during the site inspection that the impact was minimized as feasible, through minimizing the width of roads through these areas and minimizing the area disturbed around each turbine. It was noted, however, that Turbine 13 and Turbines 39-44 were placed on rolling ridges that were listed as “Significant Ecological Communities” of western wheatgrass/needle-and-thread (*Pascopyron smithii-Stipa comata*) native prairie by the North Dakota Natural Heritage Inventory which had recommended avoidance (see Docket #5, Application Appendix D, Agency Letters). It was also noted that seeding after disturbance was primarily done with non-native species including intermediate wheatgrass (*Agropyron intermedium*), smooth brome (*Bromus inermis*), and crested wheatgrass (*Agropyron cristatum*), rather than with native species as proposed (**Appendix A, Photos 21, 22**).

### **3.5.4 Wetlands**

During the construction inspection, Wenck confirmed that wetlands were avoided in the overall Project design (**Appendix A, Photos 13, 14, 28, 29**). A Wetland Summary report submitted to the PSC noted that wetlands under USFWS easement and USACE jurisdictional wetlands would be completely avoided by Project facilities using siting or boring techniques, and would be protected from impacts using erosion control structures (Docket #25-08, Wetlands Delineation Summary). Other wetlands not within easements were planned to be avoided to the extent possible. The final Wetland Report stated that as designed the Project was eligible for no notification authorization under the USACE Nationwide General Permit #12 Utility Line Activities (Docket #308, Wetland Delineation Report). A list of wetlands to be completely avoided or bored were listed in the summary report and appeared to have been followed when checked during the site visit (**Appendix A, Photo 15, 29**). There were also numerous remarks in the Plans of the Day relating to wetlands, including notes about developing wetland impact prevention plans and maps, marking and monitoring environmentally sensitive areas, reviewing environmental awareness with all crews and subcontractors (example Docket #41, Plan of Day 7-2-2008); photos of wetlands marked (example Docket #43, Plan of Day 7-3-2008); photos of erosion control structures (example Docket #51, Plan of Day 7-10-2008); notes about silt fence installation, photos of wetland sign

installation (example Docket #61, Plan of Day 7-17-2008); and removal of wetland markings, silt fence removal and repairs at the end of construction (example Docket #237, Plan of Day 11-12-2008).

### **3.5.5 Reporting**

NextEra on-site staff verbally confirmed that the Wildlife Response Reporting System (WRRS) is in place; any wildlife fatalities observed are recorded and monitored regularly and reports can be obtained if requested. There were no reports filed to date of the presence of threatened or endangered species or bald or golden eagles during construction or operation to date.

### **3.5.6 Reclamation & Reseeding**

Wenck verified that disturbed areas in non-cropped lands were reclaimed and reseeded after construction. In most pastures, the margins of the access roads and the area around the turbine base, non-native grasses such as intermediate wheatgrass (*Agropyron intermedium*), smooth brome (*Bromus inermis*), or crested wheatgrass (*Agropyron cristatum*) were growing in dense stands (**Appendix A, Photos 21, 22**). Erosion and vegetation cover were not a concern, and no annual weed outbreaks were noted. However, these grasses are non-native species that are commonly planted for revegetation. It is possible that these species were suggested by the NRCS and NextEra followed that recommendation. The use of these species does not follow the recommendations of the USFWS or the NDPR, which requested reseeded with native species. In some pastures, non-native grasses were not present in areas that would have been disturbed (**Appendix A, Photos 13, 14, 19, 23**). Drill rows in the soil were visible, so attempts to reseed had been made. Possible explanations include: 1) non-native grasses were not used in select pastures (possibly due to landowner's requests), 2) the seeds did not germinate, 3) the grass was grazed more heavily in some pastures and could not be distinguished. Whatever the reason, these haylands and pastures did not have erosion or weed problems, despite not being reclaimed/seeded in the same way.

### **3.5.7 Tree & Shrub Mitigation**

There were no natural woodlands within the Project area that were impacted by construction of the project. There were several locations where trees or shrubs were removed from planted tree rows in fields. Wenck verified that in these locations the width of tree/shrub removal was less than the 50ft maximum cut (**Appendix A, Photo 9**). NextEra has submitted a Tree & Shrub Mitigation Plan (Docket #311), a 2011 Tree & Shrub Planting Report (Docket #315), and a 2012 Tree & Shrub Survival Report (Docket #316). Wenck verified that trees and shrubs were planted. The mitigation specifications appear to be followed up to this point. The latest report states the survival rate stands at 123% because extra trees were planted. However, the planting was installed in 2011 and the PSC requires three years of survival monitoring, until 2014, for the mitigation to be considered satisfactory.

## **3.6 CONSTRUCTION, RECLAMATION & SOILS**

### **3.6.1 Construction Management & Safety**

Plans of the Day were submitted daily in fulfillment of the Order to provide weekly construction reports (Docket #31-86, 88-302, 304-306). These submissions indicated that construction of the Project proceeded in accordance to the Application and safety requirements and that an Engineering, Procurement, and Construction (EPC) contractor managed the construction of the Project. There was one occasion where the Plans of the Day indicated that construction of the collection line was suspended due to wet conditions, as ordered by the PSC (Docket #224, Plan of Day 10-13-2008).

### 3.6.2 Erosion & Sedimentation

Best Management Practices (BMPs) were used as part of the construction and maintenance of the Project to minimize erosion and control sediment. Plans of the Day remarks indicated when SWPPP inspections were taking place (example Docket #32, Plan of Day 6-24-2008); photos of erosion control structures (example Docket #51, Plan of Day 7-10-2008); notes about silt fence installation (example Docket #61, Plan of Day 7-17-2008); notes about BMP repairs (example Docket #74, Plan of Day 7-25-2008); and silt fence removal and repairs at the end of construction (example Docket #237, Plan of Day 11-12-2008). Culverts were installed where necessary to allow for the natural flow of drainage. No erosion problems were observed around the utility junction boxes; cement bollards and gravel were in place around each (**Appendix A, Photos 10, 15, 17**). In general, erosion problems were minor and infrastructure of the Project area was well-maintained. There were a few locations where erosion on the access roads or gravel pads was a problem or where ruts or channels had formed, particularly where there were steeper slopes (**Appendix A, Photos 18, 22**). NextEra noted these areas were on the maintenance list and were being addressed. Wenck observed that numerous access roads had been recently graded which was evidence of regular maintenance (**Appendix A, Photo 22**).

### 3.6.3 Minimization of Impacts

In general it appeared during the site visit that measures were taken to minimize the overall impact of the Project and the extent of land and soil disturbance. In fact, several of the final adjustments and micro-siting of the Project actually reduced the amount of area originally planned to be disturbed. Areas that would have been disturbed during construction were agricultural fields and pasturelands. Crops were harvested at the time of the survey but showed no indication of poor development or production in areas where the soils would have been disturbed compared to areas not disturbed. Pastures had been reclaimed and reseeded and there were no areas where bare soils or erosion were problems, which would have been an indication of topsoil/subsoil mixing. The staging/laydown area for the Project was located on a 20 acre area to the north and east of the substation on cultivated land, but agreement from the landowner had been secured (**Appendix A, Photos 1-4**). The area was still in use for operations, though NextEra stated it will be reclaimed in the future. An additional 20 acre area extending to the east of the current area had originally been included in the staging/laydown area but it was not built.

### 3.6.4 Utility Lines

Wenck verified that all county road and highway crossings had been directionally bored, with the route of the underground utility line indicated by red markers in most, but not all, locations (**Appendix A, Photos 5, 26**). NextEra reported that the bore for each of these crossings began and ended further out in adjacent agricultural fields, not in the road ditches. The vegetation in the ditches did not appear to have been disturbed. There were remarks in the Plans of the Day reports when and where borings took place (example Docket #62, Plan of Day 7-17-2008) and there was a record of a photo of boring machinery (Docket #67, Plan of Day 7-22-2008). All utility lines appeared to be buried at the properly required depth.

### 3.6.5 Noxious Weeds

NextEra indicated annual and noxious weeds are controlled with herbicide around turbines once a year or once every two years. Wenck observed that the substation, O&M grounds, staging/laydown area, and most of the gravel pads around the base of each turbine appeared to be well-maintained and controlled for annual weeds and vegetation growth (**Appendix A, Photos 1-4, 8, 29**). However several turbine gravel pads, roughly around 25%, had vegetation and annual weed growth from the past growing season (**Appendix A, Photo 18**). Additionally, a few outbreaks of the perennial noxious weed called wormwood (*Artemisia absinthium*) were present along access roads that went through pasture or hay land (**Figure**

**1; Appendix B).** Wenck recommends that spraying be more regular to control general vegetation growth and that particular focus be given to wormwood.

### **3.6.6 Reclamation & Roads**

Areas of the Project which had been disturbed during construction appeared to be properly restored with no long-term concerns. Notes on Plans of the Day reports indicated reclamation began in portions of the facility while construction was still in progress (Docket #209, 10-1-2008, backfill at turbines; Docket #247, 10-28-2008, reclaim at turbine string 63-65). There were notes on Plans of the Day that construction was complete (Docket #277, 306), but no remarks indicated reclamation was complete. Notes about SWPPP inspections being suspended for winter (Docket #272) indicated that reclamation of the site was possibly completed in Spring 2011. Current NextEra staff was not aware of temporary roads constructed for the project, but it is not clear if this was the case. Temporary roads were not identified in Project layout maps. During the construction inspection, Wenck did not observe any remnant temporary access roads and noted that all county roads and highways within the Project area appeared to be in good condition and properly maintained. The staging area had yet to be reclaimed (**Appendix A, Photos 1-3**). The gravel pads surrounding the tower structures appeared to have been constructed properly and were well-maintained; minor concerns of erosion and landowner plowing through gravel pads were being actively addressed (**Appendix A, Photos 11, 18**). Crops were planted as close as possible to the tower bases. None of the crops showed visible signs of poorer production or vigor, which would indicate improper topsoil replacement. Also refer to Section 3.5.6 Reclamation and Reseeding, 3.6.2 Erosion & Sedimentation, and 3.6.3 Minimization of Impacts.

### **3.6.7 Repairs & Waste**

All fences and gates were in place and fully operable. Numerous new gates had been installed for the Project where access roads crossed fencelines (no photo available). NextEra reported there had not been any agricultural fields with drainage tile impacted by construction of the Project. There was no waste, debris, or abandoned equipment observed during the inspection. The site appeared to be regularly maintained and no remnants of the construction phase were noted.

## **3.7 OPERATION**

### **3.7.1 Safety & Record-keeping**

No concerns were identified during the site review that would indicate that Project operation was out of compliance with the Application or safety regulations, other than the minor concerns noted in this report. Examples of operational safety measures observed at the site include: use of personal protective equipment, signs marking safety hazards for employees at the O & M building and at towers (**Appendix A, Photos 3, 4, 29**), and vehicle safety measures. No reports of extraordinary events were filed to date with the PSC.

### **3.7.2 Maintenance**

Wenck observed that NextEra has in place an on-going maintenance schedule. The primary maintenance issues were upkeep of tower access roads, minor erosion control, and more frequent spraying of vegetation, discussed in Sections 3.6.2 and 3.6.5. Rodent control within the towers was being actively addressed (**Appendix A, Photo 8**). Wenck did not observe any areas of exposed soil remaining from construction activity or the on-going operation of the Project that were in need of reclamation, other than the laydown area which is planned for reclamation at a future date. There was no waste, debris, or abandoned equipment observed during the inspection. The site appeared to be regularly maintained.

### 3.7.3 Public Contact & Safety

No examples of educational materials for landowners or the public were noted at the Project Site or on file with the PSC. However, Wenck noted that danger/safety warnings were in place on junction boxes, tower doors and electric boxes, surrounding the substation, and on markers indicating buried utility lines (**Appendix A, Photos 3, 4, 5, 8, 10, 29**). NextEra reported that there are no security systems in place on the doors to the towers. However the doors are locked and regularly monitored. There was a security fence in place surrounding the substation (**Appendix A, Photo 4**). NextEra staff accounted that shooting at the tower bases has been a problem with the local public. Wenck did not identify any areas where traffic control signs were necessary within the Project area. There were public access “No Trespassing” signs at entrances to tower access roads at each intersection with a county road or highway (**Appendix A, Photos 12, 15, 17**). These signs also denoted the tower identification numbers for the towers in each string, except one was missing on the road to Turbines 131-125 (**Appendix A, Photo 6**). No formal complaints have been filed with the PSC to date. Wenck received verbal confirmation from NextEra staff that landowner and resident concerns are addressed promptly and that NextEra makes every reasonable attempt to alleviate problems caused by the facility. However there were no formal procedures on file for how NextEra handles complaints or explains of the process for mitigating landowner/resident concerns.

---

## 4.0 Issues to Resolve and Recommendations

---

### 4.1 PROJECT SPECIFICATIONS NEEDING WRITTEN VERIFICATION

Several components of the Project were asserted in the Application or proposed construction and have the potential to be verified in writing, but have not been filed with the PSC. Table 2-1 summarizes these items, which are indicated as those shaded in the “Written Verification” column, indicating no written verification was provided where applicable and necessary. Wenck does not consider any of these items to be critical for Project compliance. However some were more important than others and Wenck suggests they be on file with the PSC to confirm compliance. Wenck recommends the PSC request from Next Era the following list of “Necessary” items, and if the PSC deems appropriate, the list of “Potential” items could also be requested.

#### Necessary Items

- Written evidence of apparent agreements for landowners within 1400 feet setback for occupied structures (or confirmation that the structure is not occupied) for 1) residence in the NE ¼ of the SE ¼ of Section 28, T143N, R57W, 2) residence in the SW ¼ of the SE ¼ of Section 9, T142N, R57W.
- Final as-built drawings, signed and dated by a Registered Land Surveyor.
- Federal permit copies: FAA Determinations for final Project layout
- State permit copies: NDDH NDPEs Permit, NDDH Septic Tank and Drainfield Permit, ND Highway Patrol Overheight/Overweight Permit, NDDOT Road Approach/Access Permit, NDDOT Utility Permit.
- Local permit copies: Barnes County Haul Road Agreement and Utility Permit.
- SHPO concurrence letter for Class III Cultural Report.
- USFWS concurrence letter or approval for exception to WPA buffer for road and collection line near Turbine 128.
- Spring 2008 pre-construction avian survey report.

#### Potential Items

- Clarify whether micrositing adjustments in turbine locations and access roads were allowed within the issued Certificate of Site Compatibility; or document that changes had PSC approval.
- Written verification of compliance with National Electric Safety Code.
- Records of pre-construction conference and notice of intent to start construction.
- Engineering design drawings prior to construction were ordered but not likely necessary now.
- Verification that no new discoveries of cultural, archeological, or historic sites were found during construction.
- Verification that no threatened or endangered species or bald or golden eagles were observed within the Project area during construction or during operation to date. Example of notice that would be provided to USFWS if such a species was observed.
- Summary or example of WRRS reports so PSC can confirm they are available, if needed.

- Summary or example of landowner complaints to date regarding sound, flicker, safety, or other concerns and descriptions of how the issues were handled. Or procedures for how NextEra handles complaints and mitigation of landowner/resident concerns.
- Examples of educational materials to be provided to landowners or the public if requested.

#### **4.2 EROSION CONTROL & MAINTENANCE**

Several minor concerns were noted relating to erosion control and maintenance at the site. These included 1) minor erosional channels on the edges of the access roads or minor ruts on roads, particularly on hills, 2) erosion on gravel pads surrounding some turbine bases, and 3) damage of gravel pads from agricultural equipment. None of these issues stemmed from the construction phase. All were being actively addressed by NextEra, as evidenced by recent grading and repairs to roads and gravel pads, and communication about the gravel pad damage during the inspection. Wenck considers regular maintenance to be sufficient to control these issues. However the PSC may want to bring these minor issues to the attention of NextEra for their information.

#### **4.3 NOXIOUS WEED & VEGETATION CONTROL**

Of particular concern in a few areas of the site were outbreaks of absinthe wormwood (*Artemisia absinthium*), a perennial noxious weed that is difficult to control and spreads readily. This weed was seen along the edges of several access roads. It is likely that the source of the plant was from adjacent pastures, but the disturbed soils from construction of the road had allowed the plant to increase in population. Wenck recommends a concerted effort to control this plant by spraying. Wenck also observed several gravel pads around turbine bases with vegetation and annual weed growth from the past growing season. Though the vegetation was not particularly dense or out of control, Wenck would suggest more frequent spraying to maintain the pads for improved access and safety.

#### **4.4 RESEEDING METHODS**

Wenck noted that in the majority of disturbed areas that had to be reseeded as part of reclamation, such as native pastures, it appeared that non-native species had been used, including intermediate wheatgrass, crested wheatgrass, and smooth brome grass, of which the latter two can spread vigorously into native areas. These species have been commonly used for reseeded projects in the past or planted in haylands or CRP lands. It is possible these species were suggested by the NRCS and NextEra followed that recommendation. However, the use of these species does not follow the recommendations of the USFWS or the NDPR, which requested disturbed areas be reseeded with native species. In the Application and throughout the course of Project planning, it appeared the intention of NextEra was to use only native species for reseeded. While Wenck does not consider NextEra out of compliance regarding this issue, we recommend the PSC review this issue and determine whether NRCS recommendations should continue to be followed or whether a native seed mix should be required based on requests from other agencies.

#### **4.5 WILDLIFE PROTECTION MEASURES & MONITORING**

Several measures to protect wildlife were described as part of the Project in the Application or were requested by agencies in response to the Project, but Wenck could not find evidence that they were

being implemented or justification for not being implemented. These measures should be addressed or explained in some way to ensure compliance. These measures include the following:

- Description of birdsafe design used on the overhead connections to the transmission line for the Project. Wenck did not observe bird diverters on the line.
- Description or justification of construction timing overlap with spring nesting season.
- Description of birdsafe design or bird deterrents used on MET towers.

Note also that several items related to wildlife protection are listed in Section 4.1 above as items that possibly require written verification.

#### **4.6 TREE & SHRUB REPLACEMENT**

The replacement of trees and shrubs to mitigate those removed during construction of the Project had been delayed until spring 2010 and 2011. Wenck verified that the replacement plantings were installed; and the latest report states the survival rate stands at 123%. However survival monitoring is required for the following three years until 2014. Wenck recommends that the PSC proceed with its requirement for the full three years of survival monitoring to ensure 75% survival of the replacement planting.

#### **4.7 STAGING/LAYDOWN AREA RECLAMATION**

The staging and laydown area to the north and east of the substation and O & M building was still in use at the time of the inspection. This area is planned for reclamation in the future and should be documented with the PSC when that occurs.

---

## 5.0 Conclusions

---

Overall, the Project appeared to have been constructed as designed with minimal impacts to the surrounding natural or human environment. The Project site was well-maintained and in good condition. However, Wenck observed several issues that may need to be resolved before the Project is considered complete and in full compliance. This includes provision of written documentation of particular aspects of project implementation, general erosion control and maintenance, noxious weed and vegetation control, reviewing reseeding requirements pertaining to the use of native or non-native species, confirmation of certain wildlife protection measures and monitoring procedures, continued tree and shrub survival monitoring, and reclamation of the staging/laydown area. None of these are critical issues, but the PSC should determine which are necessary for the company to comply with and then notify the company what actions are required on their part.

---

## 6.0 References

---

North Dakota Public Service Commission (ND PSC). 2013. Online Case Search. Available from:  
[http://www.psc.nd.gov/database/company\\_case\\_list.php](http://www.psc.nd.gov/database/company_case_list.php). Accessed December 2012 and  
January 2013.

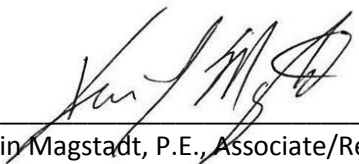
---

## 7.0 Signatures

---

The services performed by Wenck scientists for this project have been conducted in a manner consistent with the degree of care and technical skill appropriately exercised by professionals currently practicing in this area under similar time and budget constraints. Recommendations and findings contained in this report represent our professional judgment and are based upon available information and technically accepted practices at the present time and location. Other than this, no warranty is implied or expressed.

Lead Project Manager, Kevin Magstadt and Secondary Project Manager, Sara Simmers, prepared the report.

  
\_\_\_\_\_  
Kevin Magstadt, P.E., Associate/Regional Manager

\_\_\_\_\_  
1/15/2013  
Date

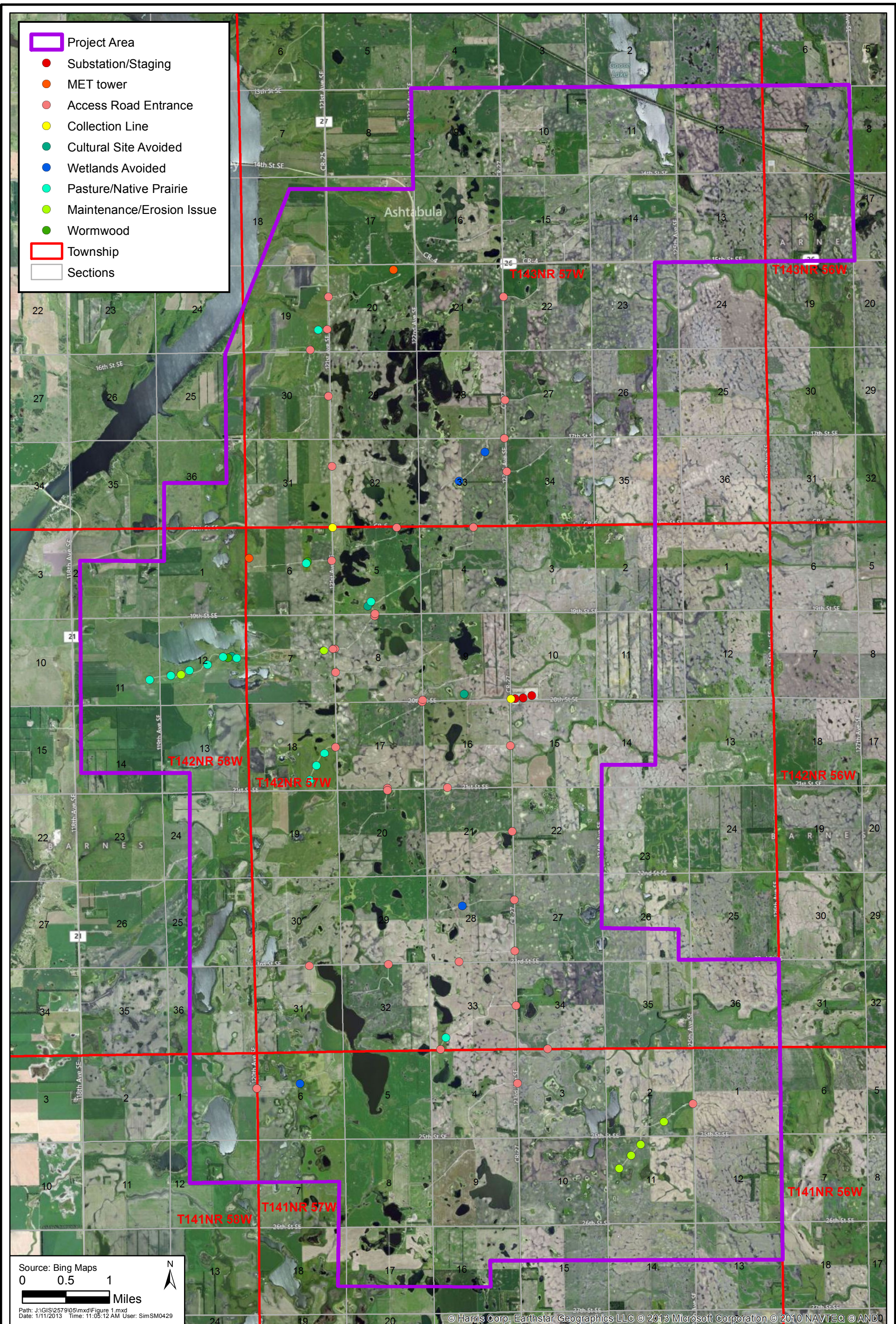
  
\_\_\_\_\_  
Sara Simmers, Botanist/Natural Resource Scientist

\_\_\_\_\_  
1/15/2013  
Date

---

## Figures

---



---

## **Appendix A**

---

### **Photographs**



**Photo 1.** Direction: West. View across the O&M building and laydown grounds from the east side to west side, located in the southwest corner of Section 10, T142N, R57W. The east side of the grounds in the foreground, along with the north side (not visible), was still being utilized for construction and staging purposes. Maintenance and operations activities and equipment were situated around the O&M building in the distance on the west side of the grounds.



**Photo 2.** Direction: North. Central portion of O&M grounds used for construction staging where tower sections were being stored.



**Photo 3.** Direction: Northeast. Far eastern side of laydown area where tower sections were being moved by semi-truck at the time of the site visit. Note the safety sign on the far right of the photo warning of overhead power lines. Turbines 63-65 are visible in the distance.



**Photo 4.** Direction: Northeast. Barnes Substation serving the Ashtabula I turbines, to the west of the O&M building and grounds. Note the crane in the distance to the north of the substation which was still being actively used for construction staging, storage, and maintenance purposes. The area around the substation had been reclaimed and the vegetation was established and in good condition.



**Photo 5.** Direction: West. Series of red markers noting locations of numerous underground collection lines leaving the substation from its southwest corner. The lines had been bored underneath County Road 27, visible beyond the ditch running north-south. Several turbine strings for Ashtabula I are visible in the distance.



**Photo 6.** Direction: West. Access road entrance to Turbines 131-125 from its intersection with 125<sup>th</sup> Ave SE. Proper safety and public access signage was in place, though the sign with the turbine names was missing. Cropland adjacent to road and turbines were in good condition and had been satisfactorily reclaimed. An archeological site on this hill had been destroyed by plowing and was deemed not necessary to avoid during Project construction.



**Photo 7.** Direction: Southwest. Continuation of access road along turbine string 131-125. Turbines, roads, and cropland were all in good condition with no concerns.



**Photo 8.** Direction: Southeast. Base of Turbine 129 showing example of typical conditions on the site. Cropland and gravel pad were in good condition. Safety signs were in place. Pad-mounted transformer is on right of tower base. This tower was one of several being controlled for mice infestations; note the small white trap to the left of the tower base (marked with red arrow).



**Photo 9.** Direction: Southwest. Road between Turbines 129 and 128 where several trees had been removed from a tree row between fields.



**Photo 10.** Direction: Northwest. Example of junction box conditions showing close-up of JB52 adjacent to access road. Cement bollards and gravel were in place around the box with no indication of erosion. Weeds appeared to have been sprayed on the gravel area, though there were a few annual weeds (tall brown vegetation) that had grown this past season. Safety warning signs were in place.



**Photo 11.** Direction: Southeast. Base of Turbine 126. The landowner had tilled through the gravel pad here and at Turbines 125 and 127, ruining the gravel surface and preventing access to the tower. NextEra was actively addressing the issue, since landowners have agreed not to disturb the gravel maintenance pad as part of the lease agreement with the wind company.



**Photo 12.** Direction: East. Entrance to access road to Turbines 105-108 from 120<sup>th</sup> Ave SE. Signs, crops, and the road were in good condition.



**Photo 13.** Direction: North. Access road along Turbine string 105-108, which was sited to avoid a low prairie/wetland complex to the north and west. It did not appear that the edges of the road had been disturbed beyond the actual road width during construction and thus had not been reseeded.



**Photo 14.** Direction: Northwest. Another view of the low prairie/wetland complex avoided by siting.



**Photo 15.** Direction: West. Access road entrance to Turbines 93-91 through cropland. Proper signs were in place. Cropland, roads, junction box, and towers were in good condition. This turbine string was on land under USFWS wetland easement. All drainages and wetlands had been avoided.



**Photo 16.** Direction: North. View of cemetery amidst scattered trees on hilltop, in the SW ¼ of Section 9, T142N, R57W (Grand Prairie Township), on the north side of 20<sup>th</sup> St SE. This architectural site had been avoided through siting of infrastructure of the wind farm.



**Photo 17.** Direction: West. Access road for Otter Tail (OT) owned Turbines 48-39, at the intersection with 121<sup>st</sup> Ave SE. The east half of the turbine string went through cropland and the west half went through rolling native prairie. Proper signs were in place. Roads, towers, junction box, and cropland were for the most part in good condition.



**Photo 18.** Direction: Southeast. The edges of the gravel pad of Turbine OT48 had eroded channels, which drained toward the edge of the access road, where a deep eroded channel had formed.



**Photo 19.** Direction: West. Road near Turbine OT46 showing the rest of the string across rolling hills. The road edges did not appear to have been planted with grass during reclamation. Rather the adjacent, existing hayland of alfalfa appeared intact up to the edge of the road; it appeared to have not been disturbed during construction or it had naturally grown back in since being disturbed.



**Photo 20.** Direction: Northwest. Area between Turbines OT44 and OT43 where a potentially eligible cultural site had been avoided during construction. The site, which had a stone circle and rock cairn on a hilltop, appeared to be intact.



**Photo 21.** Direction: West/Southwest. Access road continued through rolling hills of native prairie from Turbines OT43-39. The edges of the road appeared to have been planted with intermediate wheatgrass (*Agropyron intermedium*). There were also weeds present within the area that had been disturbed on the edges of the road, including the noxious weed absinthe wormwood (*Artemisia absinthium*).



**Photo 22.** Direction: East. Looking back toward Turbine OT43. There were several spots on hills along this access road where erosion channels had formed on the edges; however as shown in this photo this problem was being addressed through routine maintenance by grading the road and filling in the channels. Also note the different coloration of the grasses seeded for reclamation along this portion of the road.



**Photo 23.** Direction: West. Access road leading to Turbine OT39. Conditions were good with no concerns. The native prairie along this portion of the access road did not appear to have been disturbed during construction; however there did appear to be drill rows in the soil and vegetation.



**Photo 24.** Direction: West. Access road leading to Turbines OT38-34. The portion of this string near Turbine 37 that was within pasture (uncultivated land but invaded, poor quality prairie) had an outbreak of absinthe wormwood.



**Photo 25.** Direction: Northwest. MET tower to the northwest of Turbine OT34 in the NW ¼ of Section 6, T142N, R57W. The tower had guy wires. No known birdsafe design features were visible.



**Photo 26.** Direction: North. Collection line crossing of 18<sup>th</sup> St SE/County Road 6, which had been bored. Note the red marker in the north ditch.



**Photo 27.** Direction: Southeast. MET tower to the northwest of Turbine 4. This tower had guy wires, but it also had the large orange balls on the wires as a bird deterrent (red arrow).



**Photo 28.** Direction: Northwest. View of turbines on landscape, showing wetlands avoided through siting of the turbines and roads.



**Photo 29.** Direction: Southeast. Close-up of base of Turbine 23, showing example of a transformer with extra containment for oils in the pad mount. This is for extra protection in the case of a spill, since this turbine is near a wetland area (visible in the right background) which was under USFWS wetland easement.



**Photo 30.** Direction: Northwest. View of turbines across the landscape, from the southeast corner of the project area looking toward the northwest at the core area of turbine strings.

---

## **Appendix B**

---

### **Field Observation Points**

**Appendix B. Field Observation Points (GPS Coordinates)**

<b>Point</b>	<b>Feature Label</b>	<b>Northing (m)*</b>	<b>Easting (m)*</b>	<b>Observation Notes</b>
1	access road entrance	5212105.54	587041.49	access road entrance - sign missing
2	maintenance/erosion issue	5211778.03	586508.89	rodent control
4	maintenance/erosion issue	5211347.66	586077.89	plowed gravel pad
5	maintenance/erosion issue	5211150.15	585903.09	plowed gravel pad
6	maintenance/erosion issue	5210916.66	585682.23	plowed gravel pad
7	substation/staging	5219587.82	583761.00	substation - reclamation, facility good
8	substation/staging	5219600.26	583913.70	O & M building
9	substation/staging	5219640.98	584074.31	staging and laydown area
10	collection line	5219583.30	583685.22	collection line bored under highway
11	access road entrance	5212389.96	578997.01	
12	wetlands avoided	5212475.90	579795.95	wetland complex/low prairie avoided
13	access road entrance	5215868.74	583747.15	
14	wetlands avoided	5215758.78	582787.48	wetlands avoided - on easement land
15	access road entrance	5212479.88	583809.44	
16	access road entrance	5213121.87	584365.39	
17	access road entrance	5214653.04	579963.74	
18	access road entrance	5214679.17	581426.51	
19	access road entrance	5213111.91	582388.38	
20	access road entrance	5213918.59	583777.39	
21	access road entrance	5214925.01	583757.42	
22	access road entrance	5214725.26	582726.41	
23	access road entrance	5217134.53	583708.25	
24	access road entrance	5217941.21	582512.83	
25	access road entrance	5217930.45	581406.54	
26	access road entrance	5217892.04	581406.54	
27	access road entrance	5218691.03	580449.28	
28	access road entrance	5219517.68	582044.19	
29	access road entrance	5219557.63	582056.49	
30	access road entrance	5218715.62	583674.45	
31	cultural avoided	5221280.08	581042.38	archeological site
32	access road entrance	5220064.68	580452.35	
33	access road entrance	5220501.06	580440.06	
34	access road entrance	5220497.98	580401.65	
35	access road entrance	5221107.98	581171.45	
36	access road entrance	5221146.40	581176.06	
37	cultural avoided	5219668.46	582820.99	cemetery on hill avoided
38	maintenance/erosion issue	5220467.70	580235.05	erosion channels off gravel pad
40	cultural avoided	5220356.83	578533.70	archeological site
41	wormwood	5220329.11	578469.02	through prairie, weeds on road edge, wormwood
42	maintenance/erosion issue	5220020.26	577597.89	some erosion on road edges on hills
43	access road entrance	5222125.99	580377.76	
44	wormwood	5222107.68	579931.49	wormwood outbreak in prairie
45	MET tower	5222167.62	578855.78	MET tower with guy wires, no diverters
46	access road entrance	5222747.11	582993.77	
47	access road entrance	5222738.78	581576.70	
48	access road entrance	5223774.53	583611.56	
49	access road entrance	5224387.32	583563.27	
50	wetlands avoided	5224130.88	583206.92	wetlands avoided - on easement land
51	collection line	5222740.45	580396.08	collection line crossing, bored under highway
52	access road entrance	5223869.45	580382.76	
53	access road entrance	5225163.30	580319.48	
54	access road entrance	5226014.21	579983.11	
55	access road entrance	5226397.21	580297.83	
56	access road entrance	5226996.67	580319.48	
57	MET tower	5227501.23	581518.42	MET tower with guy wires, had orange diverters
58	access road entrance	5226996.67	583549.95	
59	access road entrance	5225091.70	583578.26	
60	wetlands avoided	5223601.35	582730.67	extra gravel pad containment near wetland
61	pasture/native prairie	5226383.88	580132.98	turbine in pasture/native prairie
62	pasture/native prairie	5222076.04	579909.84	turbine in pasture/native prairie
63	pasture/native prairie	5220325.92	578630.98	turbine in pasture/native prairie
64	pasture/native prairie	5220344.24	578374.54	turbine in pasture/native prairie
65	pasture/native prairie	5220201.03	578089.79	turbine in pasture/native prairie
66	pasture/native prairie	5220099.46	577751.75	turbine in pasture/native prairie
67	pasture/native prairie	5220002.88	577413.72	turbine in pasture/native prairie
68	pasture/native prairie	5219927.94	577024.07	turbine in pasture/native prairie
69	pasture/native prairie	5221366.67	581105.45	turbine in pasture/native prairie
70	pasture/native prairie	5218574.14	580244.54	turbine in pasture/native prairie
71	pasture/native prairie	5218342.68	580099.67	turbine in pasture/native prairie
72	pasture/native prairie	5218077.92	579979.78	turbine in pasture/native prairie
73	pasture/native prairie	5213322.13	582489.22	turbine in pasture/native prairie

