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October 29, 2019
Project No. A10561.239
FINAL

Mark Thompson
NextEra Energy Resources, LLC
700 Universe Boulevard
Juno Beach, FL 33408-0420

SUBJECT: Emmons-Logan Wind Energy Center Decommissioning Plan and Cost Estimate

Dear Mr. Thompson:

Emmons-Logan Wind, LLC (“Emmons-Logan Wind”), an indirect, wholly owned subsidiary of NextEra Energy Resources, LLC (“NextEra”), engaged Sargent & Lundy to develop a decommissioning plan and cost estimate for the Emmons-Logan Wind Energy Center (“Emmons-Logan” or “Project”) in North Dakota that is planned to achieve commercial operation in 2019.

Sargent & Lundy’s work was performed under the Services Agreement SA-31043 between NextEra and Sargent & Lundy, as amended on February 13, 2019.

Emmons-Logan utilizes a combination of GE 1.715 and GE 2.72 MW wind turbines. The Project is located in Emmons and Logan Counties, North Dakota.

This decommissioning plan and cost estimate was developed in accordance with North Dakota Administration Code, Title 69, Article 69-09, Chapter 69-09-09.

This report ("Deliverable") was prepared by Sargent & Lundy, L.L.C. ("Sargent & Lundy"), expressly for the sole use of Emmons-Logan Wind, LLC ("Emmons-Logan Wind"), an indirect, wholly owned subsidiary of NextEra Energy Resources, LLC ("Client"), in accordance with the agreement between Sargent & Lundy and Client. This Deliverable was prepared using the degree of skill and care ordinarily exercised by engineers practicing under similar circumstances. Client acknowledges: (1) Sargent & Lundy prepared this Deliverable subject to the particular scope limitations, budgetary and time constraints, and business objectives of the Client; (2) information and data provided by others may not have been independently verified by Sargent & Lundy; and (3) the information and data contained in this Deliverable are time sensitive and changes in the data, applicable codes, standards, and acceptable engineering practices may invalidate the findings of this Deliverable. Any use or reliance upon this Deliverable by third parties shall be at their sole risk.

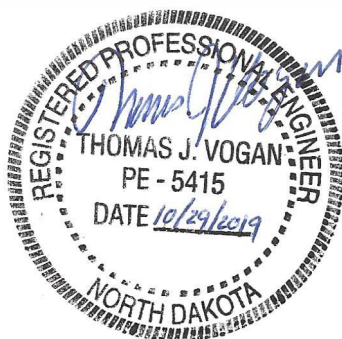
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1. BACKGROUND

Emmons-Logan Wind engaged Sargent & Lundy to develop a decommissioning plan and cost estimate for the Emmons-Logan Wind Energy Center (“Emmons-Logan” or “Project”) in North Dakota that is planned to achieve commercial operation in 2019.

Decommissioning requirements for the Project are specified by the North Dakota Administration Code, Title 69, Article 69-09, Chapter 69-09-09 [1]. This decommissioning plan was developed in accordance the specific decommissioning plan stipulations as described within Sections 69-09-09-05 and 69-09-09-06.

The purpose of this decommissioning plan is to consider the Emmons-Logan facilities and provide a recommended decommissioning plan for retiring the Project at the end of its useful life. A decommissioning cost estimate based on the parameters of this decommissioning plan is included in Appendix B. The cost estimate considers the project salvage value, but separately lists a cost estimate which excludes the salvage value.

1.1 SARGENT & LUNDY BACKGROUND

Sargent & Lundy is one of the oldest and most experienced full-service architect-engineering firms in the world. Founded in 1891, the firm is a global leader in power and energy with expertise in: all forms of electric power generation; power transmission and distribution; grid modernization; energy storage; fuel infrastructure; energy consulting; and physical and cyber-security. Sargent & Lundy’s power generation experience includes natural gas-fired, nuclear power, wind, solar, coal-fired, oil-fired power plants, among others. The firm delivers comprehensive project services—from consulting, design, and implementation to construction management, commissioning and operations/maintenance—with an emphasis on quality and safety. Sargent & Lundy serves public and private sector clients in the power and energy, government, natural gas distribution, industrial, mining, and other heavy industrial sectors.

Sargent & Lundy has extensive wind project decommissioning experience, having provided decommissioning cost estimating, decommissioning studies, and related services for more than 25 clients at more than 80 stations in addition to hundreds of retrofit projects with some demolition scope. Additionally, Sargent & Lundy has extensive experience developing cost estimates for power facility dismantlement. Over the past 10 years, Sargent & Lundy has prepared more than 270 such estimates for 10 clients encompassing 80 different units.

Sargent & Lundy has extensive wind experience in North Dakota. Since 2007, Sargent & Lundy has performed project design, due diligence reviews, and independent engineering analyses for numerous North Dakota Wind projects, encompassing over 370 turbines and more than 660 megawatts of generation.



1.2 FACILITY OVERVIEW

Emmons-Logan consists of 102 wind turbine generators (WTGs) totaling 216.135 MW:

- 61 GE 1.715 MW WTGs with 103 meter (m) rotor diameters and 80m hub height (HH) supported by 49 foot (ft) diameter spread footing foundations
- 20 GE 2.72 MW WTGs with 116m rotor diameters and 80m HH supported by 52.5 ft diameter spread footing foundations
- 21 GE 2.72 MW WTGs with 116m rotor diameters and 90m HH supported by 53 ft diameter spread footing foundations

Site access roads are spread throughout the property. The site also consists of one (1) 230kV substation. A collection system transmits power from the individual WTGs to the project substation. Emmons-Logan has one (1) O&M building and two (2) meteorological (met) towers built with monopole steel members [2]. The decommissioning plan and resulting decommissioning cost estimate includes only those items specifically listed above.

The Emmons-Logan site has a planned Commercial Operation Date (COD) in 2019. The anticipated life of the Project is 35 years.

2. DECOMMISSIONING REQUIREMENTS

The Emmons-Logan Project is located in North Dakota and decommissioning requirements are governed by the North Dakota Administration Code, Chapter 60-09-09. The governing organization is the Public Service Commission (PSC), which is the authoritative organization approving the request for the Wind Energy Center. The PSC has jurisdiction to grant the necessary approval to begin operation. The PSC requires, within this approval, an authorized decommissioning plan that must be presented along with the Project parameters.

In this section, Sargent & Lundy provides the requirements for physical decommissioning of a wind power project in North Dakota, noting that financial assurance will be provided by others in accordance with parameters defined by the PSC. The requirements are as such:

- A facility is considered at the end of its useful life if its annual CF (capacity factor) is less than ten (10) percent for two consecutive years.
- Decommissioning shall begin within twelve (12) months following the end of its useful life and must be completed with twenty-four months once initiated.
- Requirements must include:
 - Dismantling and removal of all towers, turbine generators, transformers, and overhead cables,
 - Removal of underground cables to a depth of twenty-four inches (2 feet),
 - Removal of foundations, buildings, and ancillary equipment to a depth of forty-eight inches (4 feet).
- Site reclamation is required to meet the original topography with topsoil respreads to a depth that existed prior to the disturbance.
- Grading and reseeding will be governed by Natural Resource Conservation Service recommendations.
- Once the PSC approves the decommissioning plan, Owner must update the plan ten (10) years later followed by every five (5) years thereafter until decommissioning is complete.

Based on the COD, 35 year anticipated life, and requirement to be decommissioning within 12 months after the end of the Project's useful life, decommissioning is scheduled to occur in 2054 and be completed within 24 months following the end of the Project's useful life.

3. DECOMMISSIONING AND DEMOLITION EXECUTION

This section describes the manner in which the Project will be decommissioned.

3.1 WIND TURBINE GENERATOR NACELLES AND TOWERS

Decommissioning of the WTG nacelles and towers will follow the “reverse construction” or “careful disassembly” method. Initially a crane will be moved using mobile crane mat to each WTG tower location. The outriggers will be supported by mobile crane mats designed for that purpose. Crane mats are typically made of a series of square timber beams that are long enough to accommodate the width of crane tracks. The beam height (thickness) is typically between 6 and 12 inches. The timber beams are moved in series to allow a crane to reposition from one WTG to the next. The use of crane mats is required by many rental companies to ensure cranes are safely moved around agricultural land and supported at each WTG site. The use of crane mats and mats for crane outriggers during the decommissioning process is typically sufficient to complete the work while minimizing disruption to the underlying soil.

The wind turbine blades will be lowered to ground level and cut into pieces. The nacelle and hub will be dismantled and processed at ground level. The tower will be dismantled into sections, starting at the top, and lowered to ground level to be processed and moved offsite. The base will be disconnected from the foundation and moved offsite. All WTG components and material will be transported to the appropriate facilities for reconditioning, salvage, and/or disposal.

3.2 WIND TURBINE, TRANSFORMER AND SUBSTATION FOUNDATIONS

The WTG foundation locations will be excavated and demolished to 4 feet below ground level. Excavated foundation materials will be processed for removal from site. The remaining foundation components below this depth will remain in place.

Transformer foundation pads will be excavated and demolished to 4 feet below ground level, or removed in their entirety. Excavated foundation materials will be processed for removal from site.

Foundation sites will be graded to match surrounding contours and restored to conditions that will support surrounding vegetation. All anchor bolts, rebar, embedded conduits, and concrete will be removed to a depth of 4 feet. The remaining excavation will be filled with sub-grade material of comparable gradation to the immediate surrounding area. The sub-grade material will be compacted to a density similar to surrounding sub-grade material. All unexcavated areas compacted by equipment used in decommissioning will be de-compacted to adequately restore the topsoil and subgrade material to the proper density consistent and compatible with the surrounding area.



All voided areas will be reclaimed to the original topography of the site. Topsoil will be respread to a depth corresponding to adjacent underlayment. Grading and reseeding will be in accordance to the Natural Resource Conservation Service recommendations.

In accordance with North Dakota Century Code § 49-02-27, the location of any portion of underground foundation not removed during decommissioning will be recorded with the county recorder in the county in which the facility is located.

3.3 OTHER STRUCTURES AND MISCELLANEOUS MATERIALS FOR REMOVAL

3.3.1 Met Towers

The Project met towers will be decommissioned in the reverse construction method similar to that described for the WTGs. Foundations will be removed to 4 feet below ground level in accordance with the WTG foundation decommissioning procedure.

3.3.2 O&M Building

The O&M building and any auxiliary buildings will be demolished. The building structure will be removed in its entirety and disposed with other site group materials. All underground support foundations/slabs within the building footprint will be removed to a depth of 4 feet.

All voided areas will be reclaimed to the original topography of the site. Topsoil will be respread to a depth corresponding to adjacent underlayment. Grading and reseeding will be in accordance to the Natural Resource Conservation Service recommendations.

3.3.3 Hazardous Materials

Any hazardous materials stored by the Project will be removed and properly disposed.

3.4 WTG ACCESS ROADS AND SITE ROADS

Typical wind project site roads consist of crushed compacted gravel. Approximately 74 miles of project roads are proposed for Emmons-Logan [2]. The aggregate base of the project roads will be removed from site and the remaining subgrade will be decompacted and graded to match existing and natural grade. The project roads at Emmons-Logan will be reclaimed to approximate original topography unless otherwise requested by a landowner and approved by the PSC.



3.5 COLLECTION SYSTEM

Only cable buried at 2 feet or less will be removed. As part of the decommissioning, the cables and conduits items will be cut back to the required depth of 2 feet. All cable and conduit and other materials buried below the required depth will be left in place and abandoned. No special cable cutting is required so the simplest means should be implemented.

3.6 SUBSTATION

Substation components, buildings, and material will be transported to the appropriate facilities for reconditioning, salvage, and/or disposal. All underground support foundations/slabs and cabling within the substation footprint will be removed to a depth of 4 feet.

4. DECOMMISSIONING COST ESTIMATE

The decommissioning and demolition plan described in the prior section is used as input for the generation of the decommissioning cost estimate for Emmons-Logan.

Project quantities of wind turbine generators, wind turbine towers, wind turbine foundations, meteorological towers and O&M buildings were taken from the site layout plan [2]. Site road lengths shown on the site plan were estimated to be 74 miles in length. Unit pricing for decommissioning, demolition, removal, and scrap value was taken from representative contractor price quotations and information provided by Emmons-Logan Wind. Transportation costs are included in component removal and salvage value unit pricing. A detailed line item breakout of each cost category is shown in Appendix B.

Estimated decommissioning costs for Emmons-Logan are summarized in the following table.

Table 4-1 — Emmons-Logan Decommissioning Cost Estimate

Description	Scrap Value Consideration	Cost (2019 USD)
Emmons-Logan Decommissioning Total	Excluding Scrap Value	\$13,891,000
Emmons-Logan Decommissioning per WTG	Excluding Scrap Value	\$136,180
Emmons-Logan Decommissioning Total	Including Scrap Value	\$10,063,000
Emmons-Logan Decommissioning per WTG	Including Scrap Value	\$98,650

Sargent & Lundy considers the costs shown in the table above to be reasonable estimates of the costs to decommission the Emmons-Logan Project.



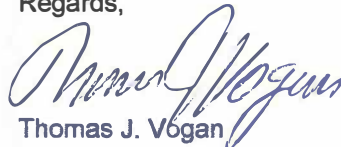
5. CONCLUSION

Sargent & Lundy developed this decommissioning plan and cost estimate for retiring the Emmons-Logan Project at the end of its useful life in accordance with North Dakota Administration Code Chapter 69-09-09.

Based on our experience with similar requirements for wind project decommissioning at other projects, Sargent & Lundy does not expect the Emmons-Logan Project to negatively impact present or future natural resource development in the area.

Please feel free to call Eric Soderlund at +1-312-269-6596 or myself at +1-312-269-2173 if you have any questions.

Regards,



Thomas J. Vogan
Senior Manager

CC: E. Soderlund (Sargent & Lundy)
B. Strawn (Sargent & Lundy)
A. Loeding (Sargent & Lundy)



Appendix A. References



REFERENCES

1. North Dakota Administration Code, Title 69, Article 69-09, Chapter 69-09-09
2. Emmons-Logan Wind, LLC - Emmons-Logan Wind Energy Center, Overall Site Plan, Issue Date 09-13-2019



Appendix B. Decommissioning Cost Estimate

Project: Emmons-Logan Wind
Owner: Emmons-Logan Wind, LLC
Location: Emmons and Logan Counties, ND

October 29, 2019

Wind Tower Decommission and Site Restoration Estimate - WTG Salvage Estimate

1.0 Turbines and Towers

Decommission of turbines and towers for this estimate includes dismantling of turbine components and transportation off site for disposal. Price excludes deduct for salvage value of the components.

Turbines: GE 1.715 & 2.72

Towers: 61 80m Steel Tower 103m rd

Towers: 20 80m Steel Tower 116m rd

Towers: 21 90m Steel Tower 116m rd

	<u>Quantity</u>	<u>Unit Cost</u>	<u>Extended Cost</u>	<u>Assumptions</u>
1.1 Dismantle Turbine & Towers	102 ea	\$ 71,500.00	\$ 7,293,000	Weighted average cost of removal, haul and disposal of turbines and towers.
1.2 Removal of Transformers	102 ea	\$ 2,750.00	\$ 280,500	Removal, hauling and disposal of transformers.
			1.0 Turbine and Tower Totals: \$ 7,573,500	

2.0 Tower Foundations

Tower foundations will be removed to a depth of four (4) feet below existing grade. Transformer foundations will be removed to four (4) feet below grade or in their entirety. Conduit connections embedded in concrete will be removed to a depth of four (4) ft below grade. Foundation sites will be graded to match surrounding contours and restored to conditions that will support surrounding vegetation.

Type: 18 ft diameter Pedestal Spread Footer Foundation

	Quantity	Unit Cost	Extended Cost	Assumptions
2.1 Foundation	102 ea	\$ 17,500.00	\$ 1,785,000	Removal, hauling and disposal of foundation concrete and steel. Site regraded to existing contours.
2.2 Transformer Pad	102 ea	\$ 1,800.00	\$ 183,600	Removal, hauling and disposal of transformer pads
2.0 Tower Foundation Totals:			\$ 1,968,600	

3.0 Other Structures

Removal of meteorological towers and O&M building included.

	Quantity	Unit Cost	Extended Cost	Assumptions
3.1 86 meter Meteorological Towers	2 ea	\$ 25,000.00	\$ 50,000	Removal, hauling and disposal of meteorological towers
3.2 O & M Building	1 ea	\$ 50,000.00	\$ 50,000	Removal, hauling and disposal of O&M facility
3.0 Other Structures Totals:			\$ 100,000	

4.0 Tower Access and Site Roads

Aggregate base roads will be scarified, loaded and removed from site. Remaining subgrade will be decompacted and graded to match existing and natural grade. Any vegetation will be re-established.

Type: Average 16 ft wide roads with 6 inches of compacted aggregate base

	<u>Quantity</u>	<u>Unit Cost</u>	<u>Extended Cost</u>	<u>Assumptions</u>
4.1 Roads	393,149 lf	\$ 8.50	\$ 3,341,765	Aggregate base will be removed and hauled off site; assumed 6" thick @ 16' wide.
4.0 Tower Access Road Totals:			\$ 3,341,765	

5.0 Collection System

Removal of termination sections near transformer to a depth 24" below existing ground line.

Type: Terminations

	<u>Quantity</u>	<u>Unit Cost</u>	<u>Extended Cost</u>	<u>Assumptions</u>
5.1 Collection system terminations	102 ea	\$ 2,300.00	\$ 234,600	Removal, hauling and disposal of collection system terminations
5.0 Collection System Totals:			\$ 234,600	

6.0 Substation

Substation excludes deduct for salvage value of the components.

	<u>Quantity</u>	<u>Unit Cost</u>	<u>Extended Cost</u>	<u>Assumptions</u>
6.1 Substation Foundations, Fence, Steel and Grading	1 LS	\$ 270,000.00	\$ 270,000	Removal hauling and disposal of foundations and fencing. Includes grading costs.
6.2 Substation Equipment	1 LS	\$ 130,000.00	\$ 130,000	Removal hauling and disposal of substation equipment
6.0 Other Structures Totals:			\$ 400,000	

7.0 Mobilization/Demobilization

	<u>Quantity</u>	<u>Unit Cost</u>	<u>Extended Cost</u>	<u>Assumptions</u>
7.1 Mobilization/Demob	1 LS	\$ 272,100.00	\$ 272,100	Typical industry price quote for mob/demob of crane at similar site location. Single mobilization and demobilization is assumed.
7.0 Mob/Demob Totals:			\$ 272,100	

Site Decommission Totals (Exclude Salvage Value): \$ 13,890,565

Site Decommission per WTG (Exclude Salvage Value): \$ 136,182

8.0 Project Salvage Value

	<u>Quantity</u>	<u>Unit Cost</u>	<u>Extended Cost</u>	<u>Assumptions</u>
8.1 Project Steel Salvage Value	18,879 TN	\$ (170.00)	\$ (3,209,430)	Varying steel compositions are grouped together as mixed steel. Quantities for tonnage based on prior project experience for similar wind projects
8.2 Project Copper Salvage Value	351 TN	\$ (1,760.00)	\$ (618,587)	Quantities for tonnage based on prior project experience for similar wind projects.
		8.0 Project Salvage Totals:	\$ (3,828,017)	

Site Decommission Totals: \$ 10,062,548

Site Decommission per WTG: \$ 98,652