Section 29

Decommissioning

Section 29. Decommissioning

29.1 State Standards

Decommissioning is a supplementary requirement for a wind energy development and is outlined in detail in Section 7 of the Wind Energy Act.

Under the State's Site Law and Wind Energy Act, decommissioning means:
the physical removal of all components of a project, including but not limited to wind turbines and associated foundations to a depth of 24 inches; as well as any structures, roads, cabling, electrical components, and any other associated facilities to the extent they are not otherwise in or proposed to be placed into productive use; the grading and re-seeding of all earth disturbed during construction and decommissioning; and restoration of any disturbed wetlands or critical wildlife habitat.

29.2 Decommissioning Approach

The Applicant contracted with Sewall to provide a decommissioning plan and budget. Should one or more turbines be inoperable for a continuous period of 12 months, unless due to force majeure, the decommissioning plan would be enacted. The Applicant will notify the Department and the Town of Rumford within two business days of any turbine failure or other incident that it anticipates will result in a turbine being off-line for a period greater than six months.

The GE wind turbines are certified for a useful life of 20 years. (See Exhibit 27-3.) During the Project's operations, the cost to decommission the project will be reevaluated every two years.

Prior to commencing construction, the Applicant will provide financial assurance to fully fund the Project's decommissioning and provide evidence of such to the Department and the Town of Rumford's Planning Board. The financial assurance may be provided in the form of a performance bond, surety bond, irrevocable letter of credit, or other form of financial assurance acceptable to the Department for the total cost of decommissioning.[1]

29.3 Decommissioning Assessment

[1] The Applicant acknowledges that, under the Town of Rumford's wind energy ordinance, the financial assurance must also be acceptable to the Town of Rumford's Planning Board. The Applicant expects that financial assurance accepted by the Department will also be accepted by the Town of Rumford.

Sewall drafted a plan to meet the State's requirements under WEA and evaluated the associated cost to decommission the Project. It summarizes the cost of decommissioning on page 6.

Decommissioning Summary

Disassembly & Removal		**Subtotal**		**Total**
1 Project Management	$	212,000.00		
2 Site Work/Civil (site reclamation)	$	145,600.00		
3 Wind Turbine Foundations	$	38,700.00		
4 Wind Turbine Generators	$	852,900.00		
5 Electrical Collection	$	35,500.00		
6 SCADA Building	$	3,600.00		
	$	1,288,300.00	$	1,288,300.00
Disassembly & Removal Total			**$**	**1,288,300.00**

The full detailed plan and budget is included as Exhibit 29-1.

Exhibit 29-1
Decommissioning Plan and Budget

Lindsay Deane-Mayer
Palmer Capital
via e-mail: lindsay@palmcap.com

October 13, 2023

FINAL

Subject: Twin Energy Wind Project Decommissioning Budget

Dear Ms. Deane-Mayer:

Sewall was requested to provide this decommissioning budget for the GE Cypress 158-6.1 MW-117HH wind turbine generators (WTG) at the Twin Energy Wind project located in Oxford County, Maine. The budget represents an opinion of probable cost (OPC), in today's dollars, for decommissioning based on the assumption that one or more turbines, or in this case, the windfarm as a whole, is no longer generating electricity for a continuous period of 12 months. Please note that in Maine, current Chapter 382 Wind Energy Act Standards no longer allow the decommissioning budget to be offset by the scrap/salvage value calculated for Maine windfarms. Also, please note that no site visits were conducted to verify actual field conditions.

Based on information confirmed with Palmer Capital, we understand any substation sites and any transmission line will not be part of the decommissioning scope. Therefore, these component have not been included in the discussion or calculations herein.

Information Sources for this Review
This review is based on the civil and electrical information previously confirmed by Palmer Capital, discussions with contractors familiar with this type of construction and our own experience with wind projects. Wage rates used in these estimates are based on the State of Maine Department of Labor, Bureau of Labor Standards; 2023 Fair Minimum Wage Rates, Heavy Construction, Oxford County.

Decommissioning Scope
The decommissioning process reflected in this OPC is based on Decommissioning Plans prepared for similar wind projects. In summary, the decommissioning and restoration process in the Plan consists of the following steps:

- Disassembly and removal of above-ground structures
- Removal of below-ground structures to a depth of 24 inches
- Re-grading and seeding

Above-ground structures include the turbines and internal transformers as well as overhead collector lines, the MET tower, and the SCADA building. Below-ground structures include turbine, MET, and SCADA building foundations. Please note that as the underground electrical collection lines are buried at a depth greater than 24 inches, we have assumed they shall be abandoned in place. Following removal of all above- and below-ground structures to 24 inches below grade, the individual disturbed areas will be re-graded to be consistent with surrounding areas and reseeded to promote re-vegetation. The cost for disposal for any materials that are not scrapped is considered incidental, unless otherwise noted.

Decommissioning Budget
The Disassembly & Removal section has been divided into six (6) general work items:

1. Project Management (contractor costs, equipment, etc.)
2. Site Work/Civil
3. Wind Turbine Foundations
4. Wind Turbine Generators
5. Electrical Collection System
6. SCADA Building

Quantities and unit prices for these individual work items are presented and discussed in more detail in the following paragraphs.

1. Project Management

1.1	General Mobilization Mobilization and demobilization of ancillary equipment (i.e. bull dozers, backhoes, etc.) is estimated to be:	$	24,300.00
1.2	Project Oversight. Oversight of the decommissioning is estimated at:	$	19,500.00
1.3	Incidentals. A budget of approximately 5% of the decommissioning costs is recommended for project incidentals, including erosion control and MET tower removal:	$	56,100.00
1.4	Contingency. A contingency of approximately 10% of the decommissioning costs is recommended to cover unknowns:	$	112,100.00
	Total opinion of probable costs for **Project Management:**	**$**	**212,000.00**

2. Site Work/Civil (Site Reclamation)

2.1 Re-grading of turbine sites.

A. The decommissioning plan includes restoring each of the turbine sites. We are assuming that all excavated areas will be brought up to grade and sloped to drain with suitable fill material generated from the re-grading of the turbine site or from off-site sources. The estimated cost includes additional fill, topsoil or other organic matter to support growth, seed, and mulch.

Approximate average disturbed area:		68,100	SF/turbine site	
Estimated cost per 1000 SF (1 MSF):	$	530.00	/MSF	
Total estimated re-grading cost for all 3 turbine sites:			$	108,300.00

B. This re-grading and restoration work is estimated to take a dozer and operator approximately three (3) days to complete at each turbine site.

Labor & equipment rate:	$	320.00	/hour	
Total re-grading and restoration work for all 3 turbine sites:			$	23,100.00

Total estimate for re-grading turbine sites is: $ 131,400.00

2.2 Road Maintenance. Approximately 1% of the $1,420,000 estimated for road construction is recommended to address dust control, road maintenance, and post construction road repairs during decommissioning.

	$	14,200.00

The total opinion of probable costs for **Site Work/Civil:** **$ 145,600.00**

3. Wind Turbine Foundations

3.1 Removal of WTG foundation to 2 FT below grade. Removal of the turbine foundations is assumed to require a hydraulic excavator equipped with hydraulic ram (hoe-ram), an additional excavator with bucket for loading, and various dozers and loaders.

Total estimated labor & equipment cost:	$	9,350.00	/site	
Total estimate for WTG foundation removal labor for all 3 turbine sites:				$ 28,100.00

3.2 Transportation of rubble and disposal. Concrete demolition rubble generated at each turbine site is estimated to be approximately 55 cubic yards (based on a removal depth of 2 feet below grade). As it is assumed the steel rebar will be separated from the concrete debris, the rubble essentially becomes an inert material. Therefore, we have assumed that the concrete rubble generated will not be transported offsite but be used onsite as fill at toes of slopes, for road base or topping material, or at other locations in need of fill as desired by the property owner. Costs to transport the foundation rubble within the project boundaries, in comparison to other decommissioning costs, are assumed to be negligible. However, in the unlikely event the material cannot be used on-site, the material will be transported for offsite use. Costs to transport the foundation rubble to disposal are based on an estimated requirement of four (4) dump truck trips for each turbine site and transported to a location within 2 hours (one-way) at an equipment and labor rate of $220/hr.

Total estimated labor & equipment cost:	$	880.00	/dump truck trip	
Total estimate for WTG foundation transportation costs for all 3 turbine sites:				$ 10,600.00

The total opinion of probable costs for removal of **WTG Foundations:** **$ 38,700.00**

4. Wind Turbine Generators

4.1 Disassembly of turbine generators, including crane rental/mobilization:

A. Mobilization and demobilization to setup and breakdown the crane and assist crane is estimated to cost a flat fee of $141,000 per one-way trip, for a total of:

$ 282,000.00

B. In addition, it is estimated that the cranes will be re-mobilized an additional two (2) times at an estimated cost of $89,000 per move to reach all of the turbine sites for a total of:

$ 178,000.00

C. Based on an assumption that the two cranes (erector and assist cranes) can disassembly two (2) turbines a week, the crane rental is estimated to be 2 weeks. Two (2) weeks are added for wind day delays.

Estimated rental costs for two cranes:	$	60,000.00	/week	
Total estimate for WTG disassembly equipment for all 3 turbines:			$	240,000.00

D. Disassembly costs for the WTGs are based on the assumption that it will take a 10-man crew 30 hours to disassemble each tower and turbine, which is roughly equivalent to the labor effort required for tower and turbine assembly. Note that the costs for removal of internal transformers are included herein.

Estimated labor rate:	$	45.00	/man-hour	
Total estimate for WTG disassembly for all 3 turbines:			$	40,500.00

E. Additionally, once the towers and turbines are on the ground, they will need to be cut up into manageable sized pieces in preparation for transportation to scrap, recycle, or disposal facilities. We are assuming it will take a 5-man crew 30 hours to do this work per turbine.

Estimated labor rate:	$	28.00	/man-hour	
Total estimate for WTG dismantling for all 3 turbines:			$	12,600.00

Total estimate disassembly of turbine generators, including crane rental/mobilization: $ 753,100.00

4.2 Transportation of turbine components to disposal/reclamation site. Cost to transport the tower and turbine components to facilities for scrap, recycling or disposal are based on an estimated requirement of 10 transport vehicles per turbine site (note: transport of new turbine and tower components to a site requires 12 to 14 transport vehicles).

Total estimated labor & equipment cost:	$	2,200.00	/transport trip	
Total estimate for turbine component transport for all 3 turbine sites:				$ 66,000.00

4.3 Nacelle housing, blade, and other component disposal. Disposal of the nacelle housing, blades, and other non-scrapable components are based on an estimated 148,100 lbs/turbine. Disposal fees are generally based on weight (in tons).

Total estimated weight of blades & nacelle:		75	tons	
Disposal fee (based on Bangor area landfill rates):	$	150.00	/ton	
Total estimate for nacelle housing and blade disposal for all 3 turbine sites:				$ 33,800.00

The total opinion of probable costs for **wind turbine generator removal:** **$ 852,900.00**

5. **Electrical Collection System**

Note that as the direct-buried underground collector is buried deeper that 2 ft, it will not be removed but be abandoned in place. Also note that transformers are internal to each WTG and their removal cost is included in the disassembly costs above.

5.1 Disassembly of overhead collector lines and associated components:

A. Disassembly and spooling costs for the overhead collector lines and associated components are based on the assumption that the labor effort required will be a 3-man crew working for four (4) hours per 1,000 feet of overhead wire.

Estimated total length of overhead lines:		9,320	feet	
Estimated labor rate:	$	34.00	/man-hour	
Total estimate for overhead collector lines disassembly:			$	4,100.00

B. Equipment rates are estimated at the following rate for approximately 5 days.

Estimated equipment rates:	$	2,700.00	/day	
Total estimate for overhead collector disassembly equipment:			$	13,500.00

C. Pole removal and filling of remaining hole, based on the following approximate quantities:

Amount of poles:		47	each	
Removal labor and equipment costs:	$	260.00	/pole	
Total estimate for overhead collector pole removal:			$	12,300.00
Total for disassembly of overhead collector lines:				$ 29,900.00

5.2 Transportation of collector lines and associated components

A. The cost to transport the collector line and associated components to facilities for scrap, recycling or disposal is based on the number of spools required per collector line sizes and lengths for the project, and a capacity of eight (8) spools per truck.

Estimated spools of collector line:		7	each	
Estimated labor & equipment cost:	$	2,200.00	/truck trip	
Total estimate for collector lines transportation:			$	2,200.00

B. Pole removal will be transported at a rate of 30 poles per logging truck. It is assumed that poles will be sold or given away.

Amount of poles:		47	each	
Estimated labor & equipment costs:	$	1,700.00	/truck trip	
Total estimate for overhead collector pole removal:			$	3,400.00

Total for transportation of collector line and associated components: $ 5,600.00

The total opinion of probable costs for **Electrical Collection System removal:** **$ 35,500.00**

6. SCADA Building

Note that site regrading will be considered incidental to the building and foundation removal.

6.1 Building removal

Demolition of an approx. 266 square foot building, including labor, equipment, and transportation to facilities for scrap, recycling, or disposal is based on a pro-rated removal rate of 20,100 cubic feet per day over 1 day at a daily cost of $10,100:

$1,500.00

6.2 Removal and transportation/disposal of building foundations.

A. Removal of the SCADA Building foundations to a depth of two (2) feet below grade is based on the approximate foundation dimensions of this facility.

Estimated foundation rubble volume:		7	cubic yards	
Estimated labor & equipment costs:	$	170.00	/cubic yard	
Total estimate for SCADA Building foundation removal:			$	1,200.00

B. We have assumed that the concrete rubble generated from the foundations (while separating rebar as necessary) will not be transported offsite but be used onsite as fill at toes of slopes, for road base or topping material, or at other locations in need of fill as desired by the property owner. However, in the unlikely event the material cannot be used on-site, the material will be transported for offsite use. Costs to transport the foundation rubble to disposal are based on 15 cubic yards per dump truck trip.

Estimated foundation rubble volume:		7	cubic yards	
Estimated labor & equipment costs:	$	880.00	/dump truck trip	
Total estimate for SCADA Building foundation transportation:			$	900.00

Total for removal and transportation/disposal of SCADA Building foundation: $ 2,100.00

Total opinion of probable costs for **SCADA Building removal:** **$3,600.00**

Disassembly and Removal Summary

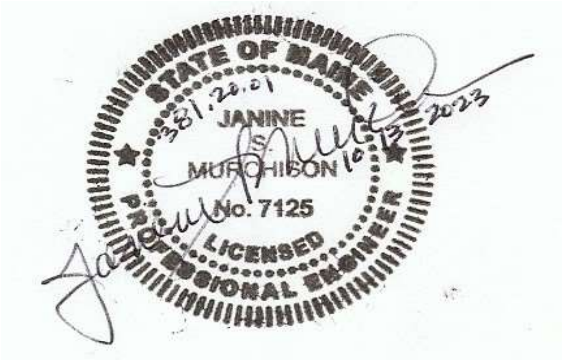
The total opinion of probable disassembly & removal costs from summing the items above: **$ 1,288,300.00**

Decommissioning Summary

	Disassembly & Removal	**Subtotal**	**Total**
1	Project Management	$ 212,000.00	
2	Site Work/Civil (site reclamation)	$ 145,600.00	
3	Wind Turbine Foundations	$ 38,700.00	
4	Wind Turbine Generators	$ 852,900.00	
5	Electrical Collection	$ 35,500.00	
6	SCADA Building	$ 3,600.00	
		$ 1,288,300.00	$ 1,288,300.00
	Disassembly & Removal Total		**$ 1,288,300.00**

Please do not hesitate to contact us with any questions regarding the information contained in this report. We appreciate the opportunity to work with you on this project.

Sincerely,
James W. Sewall Company



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