

Appendix X:
DECOMMISSIONING PLAN & ESTIMATE
(Exhibits A-13.1 & 13.2)



**EXHIBITS A-13.1 & 13.2:
DECOMMISSIONING PLAN & ESTIMATE
RIVERBEND WIND ENERGY FACILITY**

Submitted by Atwell, LLC

On behalf of

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ACRONYMS AND ABBREVIATIONS

Atwell	Atwell, LLC
BMP	Best Management Practices
EGLE	Michigan Department of Environment, Great Lakes and Energy
MPSC	Michigan Public Service Commission
PA 233	Michigan’s Public Act 233
SCDC	Sanilac County Drain Commissioner
SESC	Soil Erosion And Sedimentation Control
WTG	Wind Turbine Generators
ALU	Affiliated Local Unit

1 INTRODUCTION

The Applicant is proposing to construct a wind energy facility consisting of approximately 50 wind turbine generators (WTG) in Speaker and Freemont Townships, Sanilac County, Michigan. Per Michigan PA 233 of 2023, the Michigan Public Service Committee (MPSC) state siting Application Filing Instructions and Procedures for proposed renewable energy facilities, this document serves as Exhibits A-13.1 & 13.2 and is provided for MPSC Application compliance and is described in further detail below. In the event the ALU approves the Project, the commitments made to the MPSC in the decommissioning plan will be reassigned to the approving ALU.

Exhibit A-13.1 – Decommissioning Plan. Submit a decommissioning plan that includes the following:

1. Overview of the Proposed Energy Facility

- i. A detailed description of the proposed energy facility above ground and overview of the current land use of the site where the proposed energy facility will be located.**

The Riverbend Wind Energy Facility (“the Project”) is a proposed 50-turbine energy facility located in Fremont, Speaker, and Elk townships, Sanilac County, Michigan. The Project will also contain meteorological towers, access roads, a substation, collector system, and an operations & maintenance building. The current land use of the site is zoned agricultural.

- ii. The expected useful life of the proposed energy facility.**

The expected useful life of the Project is anticipated to be 40 years.

- iii. A description of events which would trigger applicant-initiated decommissioning.**

The end of the Project's expected useful life.

- iv. A physical and chemical analysis of the soil which can be used to ensure soil is returned to a useful condition.**

According to the USDA Web Soil Survey, the physical and chemical analysis of soils within the Project area indicates predominantly loam and sandy loam textures with pH values ranging from slightly acidic (5.3) to moderately alkaline (7.8), conducive to various agricultural and ecological uses. The Project intends to conduct soil testing during decommissioning to ensure that the soil is returned to a useful condition.

- v. A list of known hazardous substances at the time of development.**

There are no known hazardous substances identified within the Project area at this time.

**2. A description of the energy facility removal process including:
i. A proposed decommissioning schedule.**

The Project plans to complete decommissioning within 24 months from the end of the Project's life.

- Month 0-1: General Mobilization
 - Clear and Grub Laydown Yard Area
 - Install Gravel in Laydown Yard
 - Mobilize Construction Trailers
 - Install required erosion and sediment control material
- Months 0 – 4: Civil Work
 - Clear Crops from Working Area
 - Build Public Road Intersection Improvements if necessary
- Months 4 – 20: Above-Ground Facilities Removal
 - Remove all above-ground facilities, including turbines, substation, and buildings.
- Months 5 – 22: Foundation
 - Strip Topsoil in Excavation area
 - Remove Foundation to a depth of 4 feet.
 - Replace Topsoil in Excavation Area
- Months 10 – 24: Site Restoration
 - Re-seed site with appropriate pollinator-friendly mix
 - Return site to a productive and ecologically beneficial state
 - Remove Large Entrance Aprons
 - Remove Intersection Improvements
 - Remove Access Roads

ii. A description of facilities that will be removed and those that will be kept in place including the reasoning and agreement with the property owner.

All above-ground facilities will be removed, including the turbines, substation, and buildings. Infrastructure, such as cables and turbine foundations, that is buried more than 4 feet below grade will be left in place as it poses no risk to agricultural activity per the lease agreement executed with the landowners. Cables entering ground mounted transformers and junction boxes will be removed. The landowners will have the choice, as the Project is being decommissioned, whether the Project access roads on their land are to be removed. If the roads are left, maintenance of the roads will become the sole responsibility of the landowner.

iii. A description of removal methods and site clearance activities.

Refer to **Table 1: Wind Energy Facility Anticipated Disassembly Methods** and **Table 2: Generation Substation Anticipated Disassembly Methods**

- iv. A description of anticipated hazardous substances used in the facility and removal from the site based upon what is known at the time the application is filed.**

Anticipated hazardous substances used in the facility include oils, lubricants, hydraulic fluids, resins, polymers, dust, paints, and solvents. Although strict spill prevention procedures will be in place, there is the potential through the decommissioning process for small spills of solvents or fuels. The soil conditions at the turbine areas will be visually surveyed to determine if any impacts have occurred. Should soil impacts be noted, above the criteria referenced in the Michigan Department of Environment, Great Lakes, and Energy (EGLE) Part 201 cleanup criteria requirements, the affected soils will be identified, excavated, and removed to the applicable standards from the site for disposal at an approved and appropriate facility. The removed soils will be replaced with stockpiled subsoil and topsoil, if available. If none are available, clean fill and topsoil will be delivered to the site in consultation with the landowner.

- v. A description of planned materials management methods and transportation plans and an initial plan as to whether components will be sold, landfilled, recycled or other, with the understanding that such plans will be updated periodically.**

Refer to **Table 1: Wind Energy Facility Anticipated Disassembly Methods** and **Table 2: Generation Substation Anticipated Disassembly Methods**

- vi. A description of resources, conditions, or activities potentially affected by decommissioning and mitigation measures to be employed during the decommissioning process.**

It is possible that resources such as soil, surface water, and air quality could be affected by decommissioning. Best practices will be implemented, such as dust suppression, properly disposing of hazardous materials, scheduling noisy activities to minimize disturbance, and to implement soil erosion and sediment controls. Refer to **Table 1: Wind Energy Facility Anticipated Disassembly Methods** and **Table 2: Generation Substation Anticipated Disassembly Methods**

- 3. A description of the site restoration plan that returns the site to a useful condition similar to its pre-construction state. Process milestones and PA 116 restoration requirements should be detailed, including necessary steps to ensure soil is returned to at least as good or better condition.**

During operation, the Project has committed to seeding disturbed areas of the Project with a mix of pollinator-friendly and other vegetation determined to be appropriate for the region. Establishment of regionally appropriate seed mixes will allow land within the Project previously used for agriculture to become fallow, optimizing soil health and creating the conditions to allow productive farmland to return to a traditional agricultural use after the operational life of the Project. As such, the proposed facility is not anticipated to unreasonably diminish farmland, except where landowners chose to retain the access roads. Restoration of the site will return the land to a useful condition similar to its pre-construction state. Regardless of PA116 status, all agricultural lands will be restored to agricultural use following the PA116 requirements for restoration except for roads that the landowners agree to assume. Following construction, topsoil will remain on-site and can be used to grade topography to pre-construction state during decommissioning. It is expected that the entire site will be re-seeded with native grasses and vegetation unless declined by the landowner. Planting of trees, shrubs, and other woody vegetation (re-forestation) or other beautification is not planned in the costs. It is assumed that mulching and stabilization of seeded areas will only be required where gravel areas or concrete foundations were removed. Areas that return to agricultural use will not be seeded. The remainder of the site will already be vegetated, and disassembly activities will not significantly disturb the vegetation. Seeding in those areas is included as a precautionary measure against erosion. **The total cost for site restoration of the project is approximately \$412,000. See Table 3: Opinion of Probable Cost - Wind Decommissioning** for a breakdown of Site Restoration Costs.

4. A list of expected necessary permits for demolition or new temporary construction which may be required for component removal and a statement that such permits will be obtained prior to the start date of decommissioning.

Any permits required will be included as part of the decommissioning effort and will be obtained prior to decommissioning. Erosion and sediment control best management practices will be installed during decommissioning. Depending on the amount of grading required for restoration, a soil erosion and sedimentation control (SESC) permit from Sanilac County may be required. Below is a list of permits that the Project anticipates may be required for decommissioning and corresponding agencies:

- Michigan Department of Environment, Great Lakes, and Energy
 - Joint Permit Application, Parts 31, 301 & 303
 - Surface Water Discharge Construction Storm Water Permit – National Pollutant Discharge Elimination System (NPDES) Permit,
- Michigan Department of Transportation
 - Encroachment Permit

- Oversized/Overweight Vehicle Permit and Superload Permit
- Sanilac County Road Commission
 - Road Use Agreement
 - Utility, Underground, Ditching and Construction Permit
 - Non-Residential Driveway Permit
- Sanilac County Department of Construction
 - Soil Erosion and Sedimentation Control Permit (Part 91)
 - Building Permit
 - Mechanical Permit
 - Electrical Permit
- Sanilac County Drain Commission
 - Permit for Crossing a County Drain and/or County Drain Easement

5. Details describing the financial assurance:

- i. The type and manner of financial assurance the developer plans to provide (cash is prohibited), subject to the terms of any future Commission approval and Commission-approved decommissioning agreement:**
 - a. Bond.**
 - b. Parent company guarantee.**
 - c. Irrevocable letter of credit.**

Per Michigan Public Act 233, a financial security instrument (cash bond paid to the township, irrevocable Letter of Credit (LOC), or performance bond) will be required to assure payment of any decommissioning costs issued to Fremont, Speaker, and Elk townships, or the appropriate authority having jurisdiction (AHJ). The Project will be capable of providing any of the acceptable forms of financial assurance outlined in PA 233 and will determine which acceptable form in advance of the approval of the decommissioning agreement.

- ii. Such financial assurance shall be expressly held for the benefit of the Michigan Public Service Commission**

The Project commits that such financial assurance shall be expressly held for the benefit of the Michigan Public Service Commission. In the event the ALU approves the Project, the commitments made to the MPSC in the decommissioning plan will be reassigned to the approving ALU.

- 6. The following commitments and assurances shall be included in the decommissioning plan:**

- a. A commitment to provide decommissioning plan and financial assurance cost updates on a 5-year basis for the first 20 years of commercial operation and every 3 years thereafter.**

This Decommissioning Plan and Estimate will be updated on a 5-year basis for the first 20 years of operation and every 3 years thereafter.

- b. An assurance statement from that restoration will be in accordance with agreements with landowners.**

The Project commits that restoration will be in accordance with the lease agreement executed with the landowners.

- c. A commitment and plan to coordinate with landowners, ALUs, and local governments not exercising zoning authority in which all or part of a proposed energy facility will be located to the extent possible, prior to beginning decommissioning activities.**

The decommissioning process and timing will be coordinated with landowners, ALUs, and local governments prior to beginning any decommissioning activities.

- d. An assurance that decommissioning plan updates and cost estimates shall be filed in the MPSC docket assigned to the energy facility.**

These updates are to be filed in the energy facility's MPSC docket. In the event the ALU approves the Project, the commitments made to the MPSC in the decommissioning plan will be reassigned to the approving ALU.

- e. An assurance that the financial assurance shall be updated according to the required periodic decommission plan and cost estimate updates.**

Financial assurances shall be updated in accordance with these periodic decommissioning plan and cost updates.

- f. Assurance that the applicant will provide annual proof in the MPSC docket assigned to the energy facility that the financial assurance remains sufficient and in effect.**

The Project commits to annual proof in the MPSC docket assigned to the energy facility that the financial assurance remains sufficient and in effect. In the event the ALU approves the

Project, the commitments made to the MPSC in the decommissioning plan will be reassigned to the approving ALU.

- g. A statement agreeing to provide a decommissioning completion report within 60 days after decommissioning is complete.**

A decommissioning completion report is to be provided to MPSC within 60 days after the decommission of the site is completed. In the event the ALU approves the Project, the commitments made to the MPSC in the decommissioning plan will be reassigned to the approving ALU.

Exhibit A-13.2 - Detailed Decommissioning Cost Estimate

- 1. Provide a decommissioning cost estimate for restoration of participating properties to useful condition similar to that which existed before construction, including removal of above-surface facilities and infrastructure that have no ongoing purpose. The estimate must include the following:**
 - i. Detailed cost estimates for removal of energy facility equipment and infrastructure, land restoration and reclamation, and liability insurance requirements calculated by a third party with expertise in decommissioning to restore to useful condition similar to before the energy facility.**

Per **Table 3, Opinion of Probable Cost**, it is estimated that the decommissioning cost is approximately **\$150,000** per turbine, before considering the salvage value of the turbines. Turbine decommissioning estimates have been estimated from <https://www.wind-watch.org/>

The costs provided are a high-level estimate, which have not been approved or reviewed by independent agencies, suppliers, or contractors. There are many factors that could cause the estimate to change in the future, such as labor rates, transportation costs, regulatory requirements, salvage values, and changes in the decommissioning market. The estimate does not account for inflation and no future values have been estimated.

- ii. An estimate of salvage value for energy facility equipment and infrastructure calculated by a third party with expertise in decommissioning.**

Due to the uncertainty in the resale market, the worst-case scenario will be used in this decommissioning estimate, only considering the scrap value of the steel from the turbines. With an approximate salvage value of steel at \$287 per ton and a weight of 513 tons per turbine, it is estimated that salvage value per turbine is **\$147,231**. After considering the salvage value, the net decommissioning cost is approximately **\$99,096.06** per turbine. **The Project anticipates permitting up to 50 turbines, so the total bonding amount would be \$4,954,803, if all turbines are permitted.**

Salvage values have been estimated using publicly available data from <http://www.scrapmonster.com>

iii. An estimate of the cost to hire a decommissioning consultant to manage the decommissioning process in the event of owner abandonment or bankruptcy.

In the event of owner abandonment or bankruptcy, it would cost an estimated \$70,000 to \$170,000 depending on site conditions, regulations, and waste disposal options to hire a decommissioning consultant to manage the decommissioning process.

TABLE 1: WIND ENERGY FACILITY ANTICIPATED DISASSEMBLY METHODS	
ITEM	DISASSEMBLY METHOD
Wind Turbine Removal	The blades are removed one at a time, first by rotating the rotor such that the blade being worked on and removed is horizontal at the time of unbolting and handling, using cranes to lower them safely to the ground. Next, the hub is detached from the nacelle and similarly lowered. The nacelle housing is then opened, allowing internal components such as the generator, gearbox, and control systems to be disconnected and removed. Following this, the tower is disassembled section by section, beginning at the top, with each segment unbolted and lowered via crane.
Meteorological Tower Removal	Disassemble using small crane, beginning at top section with each segment unbolted and lowered.
Fence	Machine roll fence fabric. Remove posts via post-puller and transport via dump truck to staging location.
Turbine Foundations	Turbine foundations are fabricated of concrete and rebar. Topsoil and aggregate from the area surrounding the foundations will be stripped, segregated, and stockpiled near the work site for reapplication during restoration. The turbine foundation will be exposed using backhoes, bulldozers, or other earth moving equipment. The pedestal (upper part of the turbine foundation) will be removed to a depth of four (4) feet below the final ground surface. Demolition of mass concrete is generally accomplished using hydraulic hammers mounted on a backhoe or similar equipment (hoe ram). Concrete and rebar will be broken into manageable-sized pieces and loaded into dump trucks to be hauled off site. Following the removal of turbines and foundation pedestals, the resulting voids will be backfilled with clean native subsoils and compacted to a density similar to surrounding subsoils (typically approximately 90% of the fill material's standard Proctor density). Topsoil will then be reapplied to the site and graded to blend with the surrounding grade and preserve pre-existing drainage patterns.
Gravel (Access Roads)	Removal of access roads will entail removal of the road base aggregate and any other materials used for constructing the roads. During removal, the topsoil adjacent to both sides of the roads will be stripped and stockpiled in a windrow paralleling the road. The road base materials will then be removed by bulldozers and wheeled loaders, or backhoes, and hauled off site in dump trucks to be recycled or disposed at an off-site facility.
Offsite Disposal	Assumed disposal at \$95/ton or \$45/CY including tipping fee.
Re-Seeding	Re-seed using an ATV-pulled drill seeder, at 5lbs bulk seed per acre of approved native seed mix. Stabilize and mulch on areas where concrete or gravel was removed only.
Re-Grading	Minor re-grading will be done to restore the site to pre-construction condition.
Erosion & Sediment Control	Install silt fence around project perimeter. Install tracking control at site entrance and replace once during disassembly. Remove at end of disassembly.
Collector Line	The electrical cables and fiber optic conduits are installed at a depth of a minimum of 4 feet (by plan). The only exception is cables entering ground mounted transformers and junction boxes. Accordingly, the majority of underground cables will be left in place, non-functional. Cable above 4 feet will be cut off and scrapped. Following cable, junction box, and route marker removals, disturbed areas will be restored by the restoration methods described above for access roads.
Crane Paths	To facilitate the movement of the large industrial cranes used to disassemble the turbines, crane paths will be required between the turbine sites. A crane path network was designed for the construction of the wind project. The same corridors are likely to be used for decommissioning.
Crane Pads	Temporary alteration of turbine pads may be necessary to facilitate crane movements during decommissioning of above-ground turbine components. If such alteration is necessary, topsoil from the additional disturbed areas will be stripped and isolated, for re-application after turbines have been dismantled and crane pads removed. After removal of all turbine components, the crane pad area will be removed by excavating any granular materials placed during the initial construction of the crane pad. Disturbed areas will be restored to preconstruction condition by re-grading the area, reapplying topsoil, and decompacting the subsoil and topsoil.

TABLE 2: GENERATION SUBSTATION ANTICIPATED DISASSEMBLY METHODS	
ITEM	DISASSEMBLY METHOD
Steel Structures	Disassembled, lowered by crane, and transported via flat-bed to staging location.
Circuit Breakers	Removed from pads and transported via flat-bed to staging location.
Power & Instrument Transformers	Removal by crane and transport via flat-bed to staging location. Assume no disassembly or oil removal of small units, oil drained from main power transformer prior to transport.
Disconnect Switches	Removal by crane, disassemble, and transport via flat-bed to staging location. Assumed salvage value for metal components.
Insulators and Arresters	Removal from supports.
Primary Conductor	Cut cable and bus pipe at ends and transport to staging location.
Underground Cable	Excavate to cable depth at one end of trench. Use tractor or backhoe remove all cables and conduits in common trench. Transport via dump truck to staging area. Material deeper than 4' will be abandoned.
Pre-Fab Steel Buildings	Rough disassembly on site.
Control Panels	Removal of electronic components. Rough disassembly on site.
Fence	Machine roll fence fabric. Remove posts via post-puller and transport via dump truck to staging location.
Concrete Associated with Substation Pad	Remove with excavator and jack hammer to 4' below grade. Transport via dump truck to staging area.
Gravel	Remove with skid steer with sweeper. Transport via dump truck to off-site disposal location.
Offsite Disposal	Assumed disposal at \$95/ton or \$45/CY including tipping fee.
Re-Seeding & Re-Grading	Re-seed using an ATV-pulled drill seeder, at 3.2lbs per acre. Use rough grading machine to lower substation pad to native elevation.

Table 3: OPINION OF PROBABLE COST - WIND DECOMMISSIONING - ANNUAL INFLATION=0% - END OF LIFE: YEAR 40				
DECOMMISSIONING OF TURBINES AND TOWERS				
ITEM	DESCRIPTION	QUANTITY	UNIT PRICE	TOTAL
1.1	Disassembly, Disposal, and Removal of Wind Turbine	50	\$ 150,000	\$ 7,500,000.00
1.2	Disassembly, Disposal, and Removal of MET Tower	2	\$ 10,000	\$ 20,000.00
1.3	Disassembly, Disposal, and Removal of ADLS	2	\$ 10,000	\$ 20,000.00
1.0 Demolition of Turbines and Towers:				\$ 7,540,000.00
DECOMMISSIONING OF TOWER FOUNDATIONS				
2.1	Foundation Removal, Disposal, Grading, and Restoration	50	\$ 16,000	\$ 800,000.00
2.0 Demolition of Tower Foundations:				\$ 800,000.00
DECOMMISSIONING OF ACCESS ROADS AND COLLECTION				
3.1	Removal of Access Roads	104,493 LF	\$ 21.00	\$ 2,194,353.00
3.0 Demolition of Access Roads and Collection:				\$ 2,194,353.00
DECOMMISSIONING OF SUBSTATION				
4.1	Dismantle and Removal of Substation	1 Substation	\$ 500,000	\$ 500,000.00
4.0 Removal of Substation:				\$ 500,000.00
CONSTRUCTION CLOSEOUT				
5.1	Restoration and Seeding	Project Area	\$ 412,000	\$ 412,000.00
5.2	Mobilization, Permitting, and Oversight	Project Area	\$ 750,000	\$ 750,000.00
5.3	Decommissioning Consultant (In event of abandonment or bankruptcy)	1	\$ 120,000	\$ 120,000.00
5.0 Construction Closeout:				\$ 1,282,000.00
Total Decommissioning Estimate:				\$ 12,316,353.00
ESTIMATED SALVAGE REIMBURSEMENT				
6.1	Turbine Salvage Value	50	\$ 147,231	\$ 7,361,550.00
6.0 Estimated Salvage Reimbursements Total:				\$ 7,361,550.00
<i>TOTAL DECOMMISSIONING ESTIMATE</i>				\$ 12,316,353.00
<i>TOTAL DECOMMISSIONING ESTIMATE PER TURBINE</i>				\$ 246,327.06
<i>TOTAL SALVAGE VALUE</i>				\$ 7,361,550.00
NET DECOMMISSIONING COST FOR 50 TURBINES				\$ 4,954,803.00
NET DECOMMISSIONING COST PER TURBINE				\$ 99,096.06