DECOMMISSIONING PLAN

FOR

Ball Hill Wind Project

Towns of Hanover and Villenova, Chautauqua County, New York

Owner/Operator:
RES America Developments, Inc.
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I. EXECUTIVE SUMMARY

RES Developments Inc. (RES) retained Fisher Associates to prepare this Decommissioning Plan (the Plan) to outline the methods and means to decommission the Ball Hill Project (the Project) at the end of the Project's useful life, or if the Project is not completed, and to restore the Project site.[1] The purpose of the Plan is to identify the methodologies to be utilized to mitigate potential impacts resulting from the decommissioning process. All decommissioning and restoration activities will adhere to the requirements of appropriate governing authorities, and will be in accordance with all applicable federal, state and local permits and decommissioning agreements. The Applicant will obtain any federal, state or local permits required for site decommissioning and restoration prior to commencement of the decommissioning process.

The Project is anticipated to have a lifespan ranging between 25-40 years. At the end of its life, the Project will be decommissioned and its wind turbines, ancillary equipment, buildings and infrastructure will be removed as described below. Decommissioning of a turbine will be required if the turbine has not generated electricity for a period of 12 continuous months, unless the 12-month period of no energy output is the result of (a) a repair, restoration or improvement to an integral part of the Project that affects the generation of electricity and repair, restoration or improvement is being diligently pursued by the Applicant, or (b) a Force Majeure event. Force majeure includes, but is not limited to, causes or events beyond the reasonable control of, and without the fault or negligence of the party claiming Force Majeure, including acts of God, sudden actions of the elements such as floods, earthquakes, hurricanes, or tornados; sabotage; terrorism; war; riots; explosion; blockades; and insurrection. The requirement to decommission the turbine and other Facility components that solely serve that turbine will be triggered, unless otherwise agreed to with the Towns and New York State Department of Public Service (DPS) staff or unless the Applicant demonstrates to the Towns and DPS staff that it has been making good faith efforts to restore the turbine to an operable condition.

Generally speaking, the decommissioning activities will occur in the following order:

- Dismantling of wind turbines including the blades, nacelle and tower;
- Removal of electrical system, collection substation and substation control building;
- Removal of wind turbine pads and foundations;
- Removal of access/service roads (unless the landowner asks that the roads be left in place); and
- Site reclamation.

Prior to commencing decommissioning, the Project will be shut down, de-energized and disconnected from the regional transmission system at the Project interconnection switching station. The Applicant will coordinate de-energization with National Grid to ensure no disruption to the overall electrical system. Additionally, the Applicant will give landowners and the towns of

[1] Going forward, all discussions of decommissioning refer both to decommissioning at the end of the Project's useful life and decommissioning in the event construction of the Project is not completed.

Hanover and Villenova at least six weeks' advance notice prior to commencing decommissioning activity.

All aboveground components including buildings, structures and equipment will be removed during decommissioning except as otherwise specified below. In addition, all foundations will be removed to a depth of at least three feet below ground surface (bgs) in non-agricultural areas and at least four feet bgs in agricultural areas, unless otherwise required by landowner agreements. After removal of the foundation to the depth specified, it will then be backfilled, covered with imported topsoil and reseeded. Based on discussions with landowners, access roads will either be left in place or removed and the disturbed land areas subsequently graded (adding imported topsoil as necessary to ensure drainage) and reseeded as laid out in this plan.

The wind turbines, including towers, will be dismantled and either reused at other wind energy facilities, recycled as scrap metal or transported to an approved facility for disposal. Concrete pads and foundations can be fragmented and crushed into aggregate for potential reuse as road base material. After fluid removal, transformers and electrical control devices will be reused at other facilities or recycled as scrap metal while electrical equipment will either be recycled or transported to an approved facility for disposal. Underground electrical and fiber optic control cables will be de-energized and cables that were installed at depths greater than three feet bgs (four feet in agricultural areas) will be left in-place at the site.

The goal of decommissioning is the safe and efficient removal of all wind energy facility components and reclamation of the site to conditions as close to pre-construction characteristics as possible, including restoration of native vegetation, habitat and/or land use. The same safety protocols that are used during construction will be used during decommissioning.

The decommissioning process is expected to take approximately 8 to 10 months. This time includes the two week site mobilization and preparation; a 10 to 12 week period to dissemble wind turbines; an additional eight weeks to remove and reclaim turbine foundations and access roads; and two weeks to remove and reclaim the project laydown areas. During disassembly and removal and for up to four weeks thereafter, reclamation work including grading, backfilling, erosion control activity, reseeding and revegetation will take place. Reclamation monitoring will be conducted for several months thereafter and additional restoration work implemented on an "as needed" basis.

II. REMOVAL OF FACILITIES

A. Wind Turbines

Turbine disassembly will be accomplished using large cranes similar to those used for installation. Components will be removed in reverse-order of installation; blades and rotor hub first, followed by the nacelle, and ending with the turbine tower sections. The components will be loaded either directly onto trucks for removal from the Project site or placed onto the ground near the turbine base for eventual loading onto trucks.

If the wind turbine components cannot be reused on another project, they will be disassembled and sold for scrap. The hub, blades, and nacelle will be stripped down by a scrap company for

breaking down and removal of any high value components. Cabling internal to the towers will be removed and scrapped to recover the copper conductor materials. Tower sections will be removed and cut into transportable sections for delivery to a scrap metal purchaser. Control cabinets in the base will be stripped of high value components and the balance turned over to a scrap company for hauling and disposal. Any hazardous material such as motor oil or lubricants will be removed and disposed of in accordance with all applicable federal, state and local standards. See Section E below for a discussion of procedures for removing the turbine foundations.

B. Electrical Collection System

The electrical collection system includes underground collection cabling between the wind turbines and the collector substation.

Underground cabling utilized in the collection system are installed at least three feet below grade. All collection cables less than four feet deep in agricultural areas will be removed. In all other areas, cables less than three feet deep will be removed. The cables contain no materials that are harmful to the environment.

The underground cable installation includes a warning tape and tracer cable to alert anyone digging in the vicinity of the cables. The Project has recorded wind farm easements for all of the collection/transmission facilities in the Project area. This data will be available for future landowner's reference. In addition, if requested, the company will provide the landowner with information about the location of remaining underground collection lines on their property after decommissioning occurs.

When underground cables are required to be removed, a trench above the cable will be excavated to expose it. The cable will then be cut and loaded onto trucks for removal from the site and disposal. The trench will be backfilled with native soil and restored as laid out in this plan. Any existing drain tiles damaged during removal of the collection lines will be repaired. All holes left by pole and/or foundation removal will be backfilled with native soil and restored as laid out in this plan.

C. Junction Boxes

Junction box removal will consist of disconnecting the junction box from the electrical system. All high value sellable components, such as the copper conductor materials, will be removed and the remaining cables, equipment and other components will be disposed or salvaged.

After removal of the junction boxes, the remaining concrete pad will be pulverized, removed, and recycled. The area will then be restored to pre-existing conditions and contours consistent with this plan.

D. Collector Substation and Operations and Maintenance (O&M) Building

Disassembly of the collector substation will include the removal of the steel, transformers, switches, conductors, and other equipment/structures that could be reconditioned and reused or sold as scrap. All underground electrical collector cables coming to the substation from the

surrounding wind turbines will be cut at the perimeter of the substation, with any cables less than three feet deep removed in accordance with the procedures set forth in Section B above. Any hazardous material such as oil or lubricants will be removed and disposed of in accordance with applicable Federal, State and local requirements. All concrete foundations will be removed to a minimum depth of three feet, the concrete recycled, and holes backfilled similarly to the turbine foundations (see Section E below for details).

The control building at the substation will be disassembled and removed from the Facility site and its foundation removed to a minimum depth of three feet and recycled. The area will be backfilled similar to the turbine foundation (see Section E below). Fencing around the substation will be broken down and removed. Any concrete foundations for the fencing will also be removed to a minimum depth of three feet and recycled. The gravel or aggregate surface at the substation will be loaded onto trucks and removed for sale, reuse or disposal.

The O&M building will be removed, relocated, or sold with the land. All equipment, furniture, and materials within the O&M building will be removed prior to any other action. If the O&M building is removed, the foundation will also be removed, consistent with the methods for the wind turbines, and the concrete will be recycled. Fencing around the O&M facility will be broken down and removed. The gravel from any outdoor storage area or parking area at the O&M building will also be removed and will be sold and reused or disposed. Upon completion of the removal of the O&M building, the site will be restored consistent with this plan. If the building is sold with the land, the building, fence and gravel will remain in place as requested by the purchaser.

Any equipment necessary for the interconnection will be turned over to NYSEG at facility completion and is not a part of this decommissioning study.

E. Foundations

Once the turbines and substation are removed, excavation around the foundations to expose the concrete will be accomplished using traditional excavation equipment. The foundations will be excavated to a depth sufficient to ensure complete removal of the anchor bolts, rebar, conduits, cable, and concrete to a depth of at least three feet bgs in non-agricultural areas and four feet in agricultural areas unless otherwise required by land owner agreements. The concrete will be recycled. After removal of that portion of the foundation, the area will be filled with clean compatible fill compacted to a density similar to the surrounding in-situ material. All disturbed areas will receive imported topsoil and be restored to pre-existing conditions and contours consistent with this plan.

F. Access Roads

To perform the decommissioning activities, it may be necessary to temporarily return some roads to the geometry and width used during the construction stage. This allows for more efficient crane access to the turbine sites and facilitates the removal of the wind turbine components by the proper sized vehicle. A survey will be conducted of the roads to be used for hauling activities to determine the condition of the roads prior to the start of decommissioning activities. During the decommissioning process, trees above the access roads may be trimmed, and the roads may be temporarily improved to allow access including clearing, compacting, and grading.

Once decommissioning has been completed, temporary improvements will be removed and reclaimed unless the landowner requests otherwise. Similarly, turbine access roads will be removed unless the landowner requests they remain in place. Removal of turbine access roads includes the removal of gravel or aggregate and geotextile fabric as well as any culverts that are no longer necessary, followed by de-compaction of the road subgrade and shoulder. The area will then be backfilled with clean compatible fill compacted to a density similar to the surrounding in-situ material and the area graded to restore preconstruction drainage patterns. All disturbed areas will be restored in accordance with this plan.

G. Met Towers

The met towers for the Project will be removed similarly to the turbines. The met tower parts will be loaded either directly onto trucks for removal from the Project site or placed onto the ground near the turbine base for eventual loading onto trucks.

If the met towers cannot be reused on another project, they will be disassembled and sold for scrap. The met towers will be stripped down by a scrap company to remove of any high value components. Cabling internal to the towers will be removed and scrapped to recover the copper conductor materials. Tower sections will be removed and cut into transportable sections for delivery to a scrap metal purchaser. Instrumentation will be stripped off of the towers and reused, refurbished or disposed. The foundation will be removed to a minimum depth of three feet in non-agricultural areas and four feet in agricultural areas and the concrete recycled. The areas will then be graded and restored in accordance with this plan.

H. Temporary Decommissioning Facilities

As with construction, it may be necessary to establish temporary facilities to facilitate project decommissioning. The personnel involved in the decommissioning of the project will require temporary office space, equipment, and material storage. The O&M building and yard will serve as the decommissioning contractor's staging area until the O&M building needs to be removed. During the O&M building decommissioning a small trailer complex will need to be established similar to those used during the construction phase. These temporary facilities will include standard furnishings, including office section, bathrooms, air conditioning and potable water. Temporary parking will be provided along with appropriate security during standard non-working hours.

III. SITE RESTORATION

A. Reseeding, Revegetation, Backfilling and Grading

Site restoration activities will be ongoing as the decommissioning activities are completed. This work includes reseeding and revegetation using native seed mixes in non-agricultural areas. In agricultural areas, site restoration will be coordinated with the landowner to allow desired crops to be replanted. To the fullest extent possible, topsoil will be removed and stockpiled separately from other materials near the area it was removed. The recovered topsoil will be protected from erosion per current state standards. In areas where the wind farm infrastructure or decommissioning activities have compacted the topsoil surface, the soil will be de-compacted to

match the density and consistency of the surrounding area. Recovered topsoil will be placed in the disturbed areas to original depth if possible, but to a minimum depth of four inches. Final grading of the topsoil will be performed to reestablish the predevelopment surface contours and conditions where possible. Stabilization measures will be implemented in disturbed areas to control erosion and sedimentation during reclamation of the site.

To prevent the introduction of undesirable plant species into reclaimed areas and ensure slope stability, seeding and site reclamation efforts will utilize seed for grasses native to the area and free of noxious weeds. If mulch is used, the mulch will be certified weed-free prior to use in reclamation efforts. Seed mixtures may be selected in consultation with New York State Department of Agriculture and Markets (NYSDAM) for use during reclamation of agricultural areas.

The topsoil in disturbed soil surfaces within agricultural fields will be decompacted and restored to a density and depth consistent with the surrounding fields or to a depth of 18 inches. The seed mix will be agreed upon with the landowner in order to maintain consistency with the surrounding agricultural uses. All other disturbed areas will be restored to a condition reasonably similar to original conditions using native seed mixes. In all areas, restoration will include leveling, terracing, mulching, and other necessary steps to prevent soil erosion, to ensure establishment of suitable plants, and to control noxious weeds and pests. Reseeding will occur on all disturbed surfaces. Appropriate restoration methods and best management practices (BMPs) to minimize wind and water erosion will be implemented to maximize revegetation success.

In areas with steeper slopes, additional measures may be taken to reduce soil movement or erosion. These measures may include placing the topsoil in a roughened condition to prevent erosion, scarification, tilling or harrowing of the area to a depth of approximately three to four inches below ground surface to create a suitable seedbed, or dozer-tracked perpendicular to the slope to provide suitable areas for seed germination.

Grading activities will be limited to the minimal area required to complete site restoration of disturbed areas using standard construction earth moving equipment. Disturbed areas will be graded and contoured to restore the predevelopment topography and drainage of the site.

B. Erosion Control and Storm Water Management

Erosion control and storm water management during site reclamation will utilize measures and BMPs similar to those outlined in the Project's Stormwater Pollution Prevention Plan (SWPPP). These measures/BMPs will conform to the New York State Standards and Specifications for Erosion and Sediment Control in order to maintain downstream water quality and manage storm water runoff during decommissioning of the Project. Selection and design of erosion and sedimentation controls will account for climate, topography, soils and vegetative cover to be re-established at the site following decommissioning.

Silt fencing, straw bales or other similar storm water structures will be installed as needed to control soil erosion and sedimentation while re-establishing vegetation in seeded areas. Reclamation will likely include the installation of storm water control structures (e.g., berms, hay

bales, mulch) to prevent soil erosion and/or sedimentation during the seeding and re-establishment of native plants at the Project site.

Upon completion of restoration and reclamation activities, any silt fences or barriers used to facilitate reseeding will be removed when no longer needed for erosion and sediment control. To the maximum extent possible, native plants will be utilized to stabilize disturbed areas and control storm water runoff during site reclamation.

Erosion controls are the primary method for preventing impacts to storm water runoff quality while sediment controls provide a secondary method of protection to erosion controls by facilitating containment of any sediment in storm water runoff. Commonly used BMPs that may be employed at the site during reclamation include:

- Minimize disturbed areas and protect natural features of the site (native soil, topsoil, vegetation, topography and drainage areas);
- Control storm water runoff and flow to and from disturbed areas;
- Stabilize soils as quickly as possible following disturbance of work areas;
- Protect slopes and exposed soil;
- Protect culvert inlets, drainage structures and nearby surface water features;
- Establish perimeter controls around disturbed areas;
- Retain sediment to prevent transport off-site in storm water runoff; and
- Maintain controls including removal or accumulated sediment during re-establishment of vegetation.

C. Debris, Waste Management and Cleanup

Following cleanup and seeding, vegetative debris (woody and non-woody) will be reused as mulch over reclaimed areas.

Solid and industrial wastes may result from the dismantling of the wind energy equipment and structures. Trash containers and regular site cleanup will be provided for proper disposal of solid waste during decommissioning and site reclamation. Trash and bulk waste collection areas with containers will be designated at the site and materials will be recycled when possible. Litter and assorted trash will be removed daily from decommissioning areas and placed in designated trash containers for disposal. Trash, debris and any other solid waste generated during decommissioning will be minimized and managed in accordance with applicable regulations and routinely removed from the site, as needed. Any fluids generated during the decommissioning requiring disposal will be collected in appropriate containers and transported to an approved facility for reclamation or disposal.

D. Reclamation Monitoring

Following completion of site reclamation, routine monitoring will be implemented at the site to ensure that native vegetation, habitats and/or land use is re-established in the areas disturbed during decommissioning of the Project and that the site has successfully been restored to pre-construction conditions.

Reseeded areas will be routinely monitored and inspected to ensure storm water controls remain effective while vegetation is re-established for slope stability and erosion control. Once vegetation is established, any silt fences or barriers used to facilitate the process that are no longer needed will be removed.

Invasive species and noxious weeds will be managed during site reclamation to control their spread and prevent their establishment in reclaimed areas. Routine monitoring and control of weeds will be implemented at the site following completion of decommissioning activities. Vegetation control may include manual, mechanical, biological or chemical treatment methods. If herbicides are deemed necessary, their application and use will comply with applicable Federal, State, and County guidelines.

IV. SUMMARY OF DECOMMISSIONING COSTS

The Project consists of a total of 29 turbines, Vestas V136 rated at 3.45MW including six (6) on 82 meter towers and 23 on 105 meter towers. The current cost of decommissioning these turbines is estimated to be approximately $100,000 per turbine. The estimated costs of decommissioning are similar for both turbine tower heights. The estimated decommissioning costs per turbine were prepared using the lowest 5-year price for iron and steel scrap from the U.S. Geological Survey (USGS) “Mineral Commodity Summaries 2018,” and general construction costs from the New York State Department of Transportation’s (NYSDOT) web site.

The total cost of balance of plant (BOP) decommissioning is estimated to be $988,000 and includes all costs exclusive of turbines costs discussed above. The estimated decommissioning costs for the BOP including collection line, substation, and O&M building, plus reclamation activities for the entire Project were also based on the lowest 5-year price for iron and steel scrap prices from the USGS “Mineral Commodity Summaries 2018” and NYSDOT’s web site. Most collection is buried a sufficient depth to not require removal. The substation is primarily steel, and parts will either be reused or the steel sold for scrap. Finally, crushed rock surfacing will be removed from access roads, loaded into trucks and sold for reuse. Note that salvage costs have not been included in this study.

The table below summarizes decommissioning costs.

Table 1. Decommissioning Cost Summary (in current dollars) [1]			
Removal of a wind turbine		Crane operation to dismantle tower. Preparation of tower to dismantle, oil removal, cut power, etc. Tower dismantle preparation. Crane operation and breakdown, and transport.	$80,000
Removal of concrete to 36” below grade in non-ag land and 48” in ag land		Demolition of footings and foundations, including transport to recycling center, imported topsoil and grading.	$20,000
		Total per unit	**$100,000**
		Total 29 turbines	**$2,900,000**
Collection Line		Removal of underground collection line where necessary and junction boxes.	$150,000
Substation Removal		Removal of the substation equipment, power circuit breakers, fencing, etc.	$250,000
Operations and Maintenance Building		See note 2 below	$0
Reclamation of Access Roads (approximately 14 miles)		Removal, disposal, and hauling of gravel. Decompacting of road bed, importing of topsoil, grading and re-vegetation. Assumes approximately 50% of roads reclaimed at a cost of $6.00 per foot.	$213,000
Mobilization and other site restoration		Mobilization, backfill, grading, reseeding, revegetation, erosion control, etc.	$375,000
		Total Project BOP	**$988,000**
		Turbine plus BOP Costs	**$3,888,000**
		Contingency (10%)	**$388,800**
		Owner Indirect Costs (5%)	**$194,400**
		TOTAL DECOMMISSIONING COSTS[3]	**$4,471,200**

1. Costs estimated using a variety of credible industry sources, current market prices, and current dollar value.
2. It is assumed the O&M building will be reused and not demolished, but if no future use is found for the building, the estimate cost of removal would be $500,000 which includes the removal of all interior items and finishes, structure and shell, removal and recycling of concrete slab and foundation.
3. The costs associated with decommissioning and restoration will be studied by an independent licensed engineer one year after the commencement of operation of the Facility and every five years thereafter for the life of the Facility.