

Rocky Forge Wind Power Facility
Initial Report by RACC Wind
4/11/16

Study Context: The North Mountain location of this planned project is along a defining edge of Rockbridge and Botetourt's shared natural heritage district; where the James River swings around the Allegheny Highlands and out through the Blue Ridge. The Rocky Forge project would be the first industrial scale wind power facility in Virginia, a precedent setting project for the forested mountain ridges of western Virginia.

RACC Wind is a Rockbridge based volunteer network investigating a range of environmental impacts from industrial scale mountain ridge wind energy production facilities such as the proposed Rocky Forge project. RACC Wind seeks to accurately describe these impacts to the area community for a full understanding of the inherent costs and claimed benefits that this, or any other proposal of this type.

RACC Wind is in direct communication with the developer and will comment during the Virginia DEQ permitting process of the Rocky Forge Project beginning this spring. RACC Wind will participate in hopes that these governmental permitting processes can be affected to minimize the various forms of pollution and biological destruction implicit in the Project's design and development.

This proposed project deserves this attention as it is sited on a naturally forested, scenic, and ecologically important ridgeline of our region's shared natural mountain heritage. The northern Botetourt/southern Rockbridge region is the last, least developed, forested Virginia landscape providing a functioning connection for wildlife between the Alleghany Highlands and the Blue Ridge Mountains. The rapidly urbanizing I-81 corridor through the Great Valley of Virginia hinders movement and connection of plants and animals across the valley, and is already dissecting and adversely impacting the natural habitat and ecosystems with the potential to diminish species' viability and genetic health as well as overall biodiversity ([http://rockbridgeconservation.org/resources/Buffalo Creek Trifold.pdf](http://rockbridgeconservation.org/resources/Buffalo_Creek_Trifold.pdf)).

- This district's unique ecological importance has been confirmed by the Nature Conservancy, the Outdoor Space Institute studies, and the Virginia Outdoor Foundation's 2013 designation of the Purgatory Mountain/Buffalo Creek Watershed Special Project Area (<http://www.virginiaoutdoorsfoundation.org/vof-special-project-areas/>). This wildlife and land conservation district is also currently being studied as worthy of special attention within the revised Rockbridge County Comprehensive Plan's Land Use Chapter.
- Conserving this natural landscape resource supports the successful and sustainable development of our region's outdoor recreational and tourism economies.
- The Apex project's subject parcels, and all adjacent property, lie in Botetourt County's Forest Conservation (FC) Use District, the purpose of which is "to preserve and enhance the natural appearance and function of the (Botetourt) County's ridges, valleys and forest lands, to maintain the high quality of air and water resources, and low density of development." The project site frames a southern gateway into the George Washington National Forest and is about two miles from Moore's Creek State Forest.

Currently Known Ecological Impacts of the Rocky Forge Proposal:

- RACC Wind estimates that this project will deforest and openly bisect the site's existing ridgeline ecosystems with losses to plant and wildlife habitat by total clear cutting, and re-grading of upwards to 170 acres for construction of some 11 miles of 36-foot-wide graveled haul/access roads, 25 five-acre sites for the massive turbines, and all the associated above-ground and underground electrical power facilities including a five acre operations and maintenance site and an Interconnect substation. Blasting will be required to extend foundations to competent bedrock at each turbine location. Blasting may also be required to grade elements of the 11 miles of 36-foot-wide roads. According to Geologist Dr. Ed Spencer, the geology of the site is underlain by, and has exposed quartzite formations raising questions of the cost feasibility of proposed underground connections.

- The deforestation of about 120-140 acres will reduce valued natural carbon sequestration provided by these existing forests.
- The clearing of the forest will increase temperatures in the project area due to lack of shade, and increase the establishment of invasive plant species.
- Operations of the proposed project will result in the deaths of migratory songbirds, bats and perhaps golden eagles with consequent effects on the ecosystem (<https://abcbirds.org/threat/bird-strikes/>).
- Golden eagles visit the western slopes of North Mountain all the way to the southern end of Purgatory Mountain and back. The Eastern range population of this species is small and vulnerable. Eastern golden eagle migration is strongly associated with the Appalachian ridgelines. In Virginia the birds can be seen migrating southward between October and early December, and northward during April and May. Wintering eagles spend the months of December through March in the Commonwealth. The loss of any of this small, vulnerable population increases the risk of extinction of this species (<http://www.dgif.virginia.gov/wildlife/birds/golden-eagle/>).
- There are specific concerns about the destruction of endangered Indiana bats known to roost in local area caves (<http://www.dcr.virginia.gov/natural-heritage/document/anlist2016.pdf>). For further detailed discussion see www.wind-watch.org/faq-wildlife.php.
- There is potential for significant degradation of the affected watersheds' surface water and interconnected groundwater quality. Tree canopy and permeable forest soils on forested ridges intercept rainfall so that it usually evapotranspires or slowly penetrates the ground to recharge the groundwater aquifer rather than flowing overland as runoff. When development occurs on forested ridges or where there are numerous roads constructed on forested ridges, the protective tree canopy and understory is lost and soils are compacted and/or paved. The resulting storm water runoff is greater in the cleared areas and roadways, and the increased storm water discharge results in increased sediment and pollutants in streams, increased bank erosion downstream, and decreased groundwater recharge.

- The construction and operation of the project increases pollution risks from chemical spills, diesel engines operations, and herbicide and pesticide uses.
- The Project will subject onsite and offsite human and wildlife populations to both audible and infra-sound impacts.
- The sound study conducted by Apex models a turbine different from, and of a lower height, than those proposed in their Special Permit Application to the Botetourt BOS.

The impacts listed above are particularly egregious within the identified Natural Bridge (Buffalo Creek) Wildlife Corridor and the VOF Buffalo Creek Purgatory Mountain Special Project Area (SPA).

Apex has refused RACC Wind's request to review their consultant's field data and environmental reports which means that environmental issues may yet surface.

Visual impacts will be widespread as mountain ridges typically form the region's prominent edge-of-sky visual element.

Localized scenic impacts are highly site specific as affected by elevation, topographic context, and distance. Most Rockbridge views to the North Mountain ridge top turbines can be characterized as beyond 5 miles (background), but are significant and widespread.

- A new map by W&L Professor of Geology, David Harbor, shows the number of the proposed turbines visible (based on the APEX assumption of no vegetative screening) from the affected Rockbridge County viewsheds (go to: http://rockbridgeconservation.org/resources/info/wind/20160121_visibility_map.pdf and http://rockbridgeconservation.org/resources/info/wind/20160121_visibility_map_southern_rockbridge.pdf.)
- Wind turbines are intentionally high contrast against background sky conditions. FAA requires wind turbines be painted white or very light grey, as these colors have been shown to be the most effective method for providing daytime "conspicuity" for aircraft.

- Night sky light pollution is primarily produced by industrial scale wind energy developments by aviation lights. The Rocky Forge project's taller than 499' blade reach triggers an FAA requirement of a 2nd (redundant) red LED light per lighted turbine (14 CFR, Part 77).

Energy production from mountain ridgeline wind energy resources:

Apex Inc. has declined RACC Wind's request to see or use their field data so that we might confirm Apex's projection that Rocky Forge will produce power equivalent to about 20,000 average American homes' usage. RACC Wind's volunteer engineering analysts are seeking alternate data for as close a calculation as is possible without the site data, but currently question whether the actual power production of the proposed wind plant will be as high as Apex's current projections.

PJM Interconnect, LLC owns the transmission infrastructure in the American northeast, including Virginia. Their preliminary study to connect the Apex project to their Lexington Low Moor 230kV transmission line estimates the installed facilities would have a total capability of 78.2 MW with 10.1MW being recognized by PJM as capacity. Accordingly, PJM is planning a transmission line to carry 10.1 MW. This means the most they expect out of the project (understanding the line is oversized for a safety factor) is 10.1 MW of power, 13% of the 75MW project's theoretical capacity (*Generation Interconnection Feasibility Study Report For PJM Generation Interconnection Request Queue Position AA1-038 Lexington Low Moor 230kV 10.1MW Capacity / 78.2MW Energy*, PJM Interconnect, LLC, February 2015).

It should be understood that because productive winds are intermittent at sites like Rocky Forge, utility scale wind facilities generally still require a conventional power plant continuing to burn coal or natural gas, so that energy can be readily available during times of low production or when wind turbines are off-line.

Additionally, according to a representative of the US Fish and Wildlife Service, the turbines should be curtailed when ambient wind speeds are at, or below, 6.9 m/s in order to prevent turbine blades from killing the endangered bat

species in the area. We understand that APEX has measured wind speed from the three stations at the Rocky Forge site and inputted that data into AWS Truepower[®] software to develop the map of 'mean' wind speeds shown in their application. The map shows that 13 of the 25 turbines will be sited in areas that have 6.5 m/s or lower mean wind speeds – well within the curtailment conditions – which indicates further reduction of power production.

Some informed analysts have concluded that energy conservation investment is more cost effective than industrial wind development when the environmental costs and benefits are compared. Conservation reduces overall demand for electricity, regardless of whether that power is being generated by air polluting fossil fuels or renewable alternatives (<https://www.wind-watch.org/faq-costbenefit.php>).

Compared to other windy American open spaces and offshore Virginia locations, the mountain ridges of the Appalachian Valley and Ridge Province are modest performers at best while simultaneously imposing significant impacts on local communities and the environment (<http://www.nrel.gov/gis/images/US-50m-wind-power-map.jpg>). It is notable that while significant solar energy resources are distributed broadly throughout our region, the wind energy resources are primarily concentrated along mountain ridge tops.

RACC Wind presumes there is broad support among RACC's membership and most citizens generally for clean, renewable, solar and wind energy projects where they are on appropriate sites and of net benefit to our communities' health and quality of life interests. As of now, however, RACC Council believes that the Rocky Forge industrial wind plant development up the spine of North Mountain seems to be a "right idea (sometimes), definitely in the wrong place,".