

Via: Hand Delivery at Public Hearing

July 28, 2006

Town of Warren Town Board
642 Kingdom Road
Mohawk, NY 13407
Attn: Richard Jacks

Subject: Jordanville, NY – DEIS Review

Dear Mr. Jacks,

Pressly & Associates, Inc (Pressly) was retained by Advocates for Stark and Otsego 2000, Inc. to conduct a review of sections 3.0 –3.2.3 of the Jordanville DEIS. The review was focused on assessment of the potential impacts to local water resources as well as the Upper Susquehanna River and Mohawk River Watersheds.

Subsurface Turbine Construction Details

The foundations for the turbines are proposed to be a raft type concrete structure with a diameter of up to 60 feet and a depth of up to 9 feet. In some cases a concrete caisson type foundations may be constructed with a diameter of 22 feet and a depth of 30 feet.

A total of 21 miles of access roads shall be constructed. The roads are reported to require an initial 75- foot wide clearing with a finished gravel surface of up to 20 feet in width.

A total of 41 miles of buried electrical lines will require an area of disturbance of up to 25 feet wide for the movement of machinery. The trenches are proposed to be 3 feet wide and 3 feet deep.

Topography

The project area is part of a larger hilltop or plateau averaging about 1500 feet mean sea level (msl) elevation. The slopes on the perimeter range from 0 to 20 percent with the steepest slopes towards the northeast and southeast. The area contains numerous wetlands and the origin of both protected and unprotected streams that flow towards Mohawk River to the north and form part of the headwaters for the Susquehanna River to the south.

The slope of the ground surface will give a rough approximation of the surface and ground water flow direction within the project area. The northeast portion of the project area decreases in elevation towards the northeast and eventually the Mohawk River. The southeast portion of the project area slopes towards the southeast and the Otsquago Creek. Otsquago Creek flows northeast towards the Mohawk River. The northwestern portion of the project area also slopes to the north. The southwestern portion of the project area is relatively flat and contains the largest wetland areas. Surface water appears to flow south from this area towards Canadarago Lake and the Susquehanna River.

Geology

An exploration program, consisting of 5 borings, was conducted by GZA, GeoEnvironmental of NY. Bedrock was encountered at two of the boring locations TB-3 and TB-5 at depths of 4 feet and 7.5 feet below grade, respectively. Bedrock cores were obtained and described by a geologist. The bedrock

encountered at TB-3 was identified as the Coeymans Limestone. The bedrock at TB-5 was described as the Onondaga Limestone. Bedrock core holes did not retain water suggesting a high drainage rate through the weathered bedrock zone and underlying fractures.

Based on the boring results and Figure 2 of the GZA report, it may be inferred that approximately 40 percent of the project area will contain shallow bedrock that will require blasting, hydraulic fracturing, or pneumatic jackhammering regardless of whether a raft or a caisson foundation is installed.

Wetlands and Streams

Virtually all of the protected streams flow towards the northeast and southeast towards the Mohawk River. A north-south groundwater divide appears to exist just north of the Holy Trinity Monastery located on the western side of the project area. The streams located to the southwest were unprotected and interconnect the area's largest wetlands (NYS DEC JV-6 and JV-9), which are located on the southwest perimeter of the project area. These streams emanate from the hilltops which were proposed to contain turbines 5-7, 28, 89, 13, 87, 14, 15, 17A, 18, 19, and 22A.

Note that the vast majority of wetlands within this area as well as all other areas of the project were not included in the "Project Area", even though they are the same distance from proposed project construction activities as other wetlands that were included. The reason for this was evident after a comparison of Figure 7 (NYS DEC Wetlands) to Table 6 (State Regulated Wetlands Within the Project Area). When compared, the "Size Within Project Area" of wetlands corresponds to the green shading of "Participating Parcels". Therefore, wetland area impacts in the study were underestimated by over 100 percent because they were not specifically located on lands of "Participating Parcels".

The wetland Ids shown in Table 7 (Estimated Temporary Impacts to Wetlands and Surface Waters) were not depicted on any maps, therefore, a review of the potential impacts was not possible. In general, it appears that "avoidable" impacts to wetlands were not avoided at many locations. These included the following:

- Turbine 80 located adjacent to NYS DEC wetland VH-4.
- Turbines 6, 94, 12A, 29, 48, 95, 96, 70, and 71 were located adjacent to or within NWI wetlands

Note that the Army Corps of Engineers has jurisdiction over the NWI wetlands and should be included as an involved agency for this project.

As stated in the report, 21 miles of new access roads will be constructed in the project area. It was estimated that the current road mileage abutting or within the participating parcels was approximately 25 miles. Therefore, the number of roads within the project area will be nearly doubled. Consequently, runoff within the project area will be nearly doubled, despite the statement on page 45 of the report, "Construction of access roads will result in minor increase in storm water runoff that would otherwise have infiltrated into the ground at road locations".

The nearly 100 percent increase in road runoff within the project area increases potential contaminant migration into wetlands resulting from:

- turbidity (due to land clearing, excavation),
- pH changes due to concrete spills, and truck washouts,
- road deicing,
- herbicide use, and

- dust suppression chemical use.

Groundwater

The report did not provide a groundwater study. The direction of groundwater flow is crucial for the protection of public, commercial, and independent domestic water supplies as well as the surface waters that are hydraulically connected to the groundwater. This would include the natural limestone artesian well that supplies groundwater to the NYS DEC Fish Hatchery located less than 1 mile to the southeast of the project off Chyle Road. Based on the bedrock map (Figure 2) provided by GZA, the limestone supplying the hatchery's groundwater is part of the Coeymans Limestone, although it is bordered nearby with the Cobleskill and the Onondaga Limestone formations. Discussions with hatchery personnel indicated that water was flowing from the well in excess of 400 gallons per minute, suggesting cavernous limestone aquifer characteristics. Further evidence of this formation's cavernous characteristics can be observed at Howe Caverns, which were formed within the Coeymans Limestone.

Groundwater flow through limestone occurs within fractures, cavities, and caverns that can have very relatively high hydraulic conductivities. Groundwater flows relatively fast and is less filtered through this media as opposed to a sandstone or unconsolidated overburden aquifer. Thus, pollutant attenuation will be minimal. Permeability within limestone aquifers of this type can be high to very high, ranging from 100 to 100,000 ft/day (Groundwater Manual, U.S. Department of the Interior, 1981).

The hatchery water supply as well as other water wells located near the project area may be potential receptors of contamination resulting from infiltration of contaminants into bedrock fractures at recharge locations with the highest elevation. The contaminants may include but are not limited to:

- turbidity (due to land clearing, excavation, and blasting),
- pH changes due to concrete work, spills, and truck washouts,
- road deicing,
- herbicide use, and
- dust suppression chemical use.

Note that the impacts of dust suppression chemical runoff were documented at the Tug Hill Wind Farm Project, where all fish at the local fish hatchery were killed.

Figure 5 depicts the headwaters of unnamed protected streams, which flow towards the fish hatchery and are directly adjacent to turbines 57, 58, 59, 85, and 86. Directly north and also located within the same Coeymans limestone are up to 15 turbine areas which, according to Figure 2 of the GZA report will contain bedrock at depths of 1-3 meters from the ground surface and, therefore, blasting, hydraulic fracturing, or pneumatic jackhammering will be required. This will pose a risk to potential receptors by:

- Exposing large bedrock surface areas causing enhanced infiltration of strong basic water (from concrete work) and turbidity into the bedrock aquifer.
- Diversion of groundwater flow due to rock excavation activities, which will cause flow channels within the limestone seal off or open up in unpredictable ways.
- Diversion of groundwater flow and recharge due to presence of impermeable structures at the highest points of recharge where orientation of groundwater divides may be altered.

Recommendations

In order to ensure the protection of surface and groundwater resources within and surrounding the project area, the following was recommended:

- Conduct a Groundwater Investigation sufficient to evaluate vertical and groundwater flow across the project area and specifically between the project area and the fish hatchery. The study should include both bedrock and overburden wells that can provide future monitoring points relative to any identified potential receptors of groundwater contamination.
- Conduct a well survey to identify public, commercial, and domestic water supplies within ½ mile of the project area.
- Conduct a fate and transport analysis of identified contaminants relative to the identified wells and the fish hatchery.
- Revise the wetland impacts analysis to include an accurate measure of acreage impacts based on a reasonable setback, rather than arbitrarily selecting only those wetlands areas touched by “participating parcels”.
- Avoid placement of turbines immediately adjacent to wetland areas and streams.
- Contact the Army Corp of Engineers for review and permitting of NWI wetland impacts.

It was a pleasure to assist you with your environmental needs. If you have any questions, please do not hesitate to call me at 607-264-9521.

Sincerely,

Nicholas Pressly
Environmental Projects Manager

Cc: Kevin Kispert, NYS DEC, 635 Broadway, Albany, NY 12233-1011