

4.2 GEOLOGY, SOILS AND TOPOGRAPHY

The following comments are related to concerns regarding potential blasting impacts:

Written Comment 13F:

Blasting – while the DEIS addressed the potential of blasting, there is no real plan outlined. Of grave concern to me is the idea that blasting is even being considered in an area so well-known for oil and gas fields. This just seems like a really bad combination of activities. When will Everpower provide a more detailed study and plan as it relates to blasting? This issue absolutely warrants considerable further investigation.

Written Comment 54HH:

DEIS Section 3.1.2.1 (p. 41) states “blasting is not expected to be required *assuming that excavation depths into bedrock are limited to less than four feet and assuming that bedrock conditions at each of the turbine sites are similar to those at the test boring locations...* (emphasis added). However, based on the typical depth to bedrock conditions stated in the DEIS, it appears that some blasting may be necessary. Therefore, identify the physical measures that will be taken to avoid blasting for turbine foundations. Mitigation measures should include considerations for additional borings or sonar testing to allow for minor adjustment in foundation locations and alternative foundation designs to account for conditions with less cover.

Oral Comment 25C:

The amount of blasting required to install turbines on Chipmonk ridge is not acceptable. Therefore, no wind turbines in this area.

Response to Written Comments 13F, 54HH and Oral Comment 25C:

A Preliminary Blasting Plan is included as Appendix A to the DEIS, and this plan provides a significant amount of detail regarding blasting methodologies and requirements. Construction of the Project has been proposed in a manner that will minimize any blasting. The typical foundation depth for the turbine will be 10 foot below grade. It is anticipated that the majority of the turbine foundations will be excavated with conventional excavation equipment. It is most likely that the contractor will be able to dig a foundation the majority of the depth and if rock is encountered that is not rippable, a pneumatic hammer attached to the backhoe would be used to hoe ram out the balance of the depth. Geotechnical borings will be performed at all turbine locations, which will be used to support the final structural design of the Project. Once on-site borings have been performed, two to three different foundation designs will be developed for the

project to accommodate varying soil conditions and rock elevations. Standardization of foundation designs will allow for minor adjustments to accommodate actual field conditions and minimize soil disturbance and environmental impacts.

With respect to interaction with oil-gas infrastructure, please see Responses to Written Comments 54MM and 54NN in FEIS Section 4.1.5.

As to Oral Comment 25 C, the comment is noted, but provides no basis for response.

The following comments are related to potential impacts to geologic formations:

Written Comment 16I:

Little mention has been made regarding the damage to geologic formations in the area along the ridgeline. These formations are locally known as Martiny Rocks, Coon Rocks and the commercially developed natural area know as Rock City Park. What right do we, who are currently making decisions affecting the local environment, have to take away forever from future generations these natural formations? Nowhere did I see adequately addressed in the Draft Environmental Report the effect on these formations. These geologic formations have been enjoyed and utilized for eons. As far as I am aware, there are no plans to investigate the area of the geologic formations for historic or earlier evidence of man's use of these rocks. There may be undiscovered evidence of native or even pre-native use of these rock outcroppings similar to discoveries near Avella, PA as described in the following internet link:

http://en.wikipedia.org/wiki/Meadowcroft_Rockshelter

Lacking a thorough pre-investigation, this evidence might be lost forever, or perhaps even bring the installation of the turbines to a halt if the evidence is uncovered during construction.

Oral Comment 15C:

In all cases, the number one asset to our area is our natural surrounding and visual beauty. As a business owner, I hear firsthand the impact our unique natural surroundings have on visitors coming to the Allegany-Olean area. It is no secret that most out-of-town business guests have little desire to visit our area; that is until they come here for the first time and experience the mountains that we call home.

Rock formations and those known as Coons Rocks and Martiny Rocks on the West branch ridges are 320 million years old. Having hiked the mountain ridges on the West Branch for over 30

years and through extensive study of topographical maps and from aerial flights over the western edge of the West Branch valley that is home to three (3) wind turbines and Coons Rock, I can tell you that extensive blasting is required to gain access to the three northern most turbines. We hold sacred those structures on the national registry, yet a vote in favor of the current wind turbine proposal will turn a blind eye to the destruction of rock formations that are unique to our area. This is a travesty and not consistent with the values of the people that make up this community. Everpower will say there will be minimal blasting of such rocks. I know these rocks and ridges intimately. I invite any board member to accompany me on a flight over this ridge to show you the proposed access road its route through Coons Rocks. Coons Rocks will cease to exist in their present form if these turbines are installed where indicated.

Response to Written Comment 16I and Oral Comment 15C:

As to the use of the geologic formations, including potentially intrusive uses, the oil, gas, and other natural resource extraction activities such as logging, have been occurring (and resources used by local and regional residents) for well over a century, and the result is the current environment praised in the comments. There is no information provided indicating unevaluated or significant environmental impacts. The rock formations were noted during field surveys conducted at different times by three independent firms while studying geologic, cultural, and ecological resources. The rock formations are discussed in Sections 3.1 and 3.3 of the DEIS, and additional detail is provided in DEIS Appendix B, including descriptions and photographs of the formations.

With respect to impacts to geologic formations due to blasting, as discussed in Section 3.1.2.1 of the DEIS, blasting of any kind is not anticipated.

In addition, as indicated in Section 3.1.2 of the DEIS, “the Project Sponsor’s Director of Construction and EDR personnel conducted detailed on-site investigation, and as a result of these efforts it is expected that essentially all surface boulders [i.e., rock formations] will be avoided.” To expand on this quote from the DEIS, where necessary significant effort was expended to identify access road routes and turbine locations that avoid rock formations. Due to the high density of rock formations in some locations, it is not practicable or necessary to identify/survey all rock formations; however, defining constructible routes for Project components has resulted in a proposed action that will minimize impacts to rock formations to the maximum extent practicable.

See also Response to Written Comments 13F, 54HH and Oral Comment 25C above. As to the archeological inquiry, as part of the DEIS, Phase 1A Cultural Resources Survey, Historic Architectural Resources Survey, and Phase 1B Archeological Survey were conducted, see DEIS Section 3.6 and FEIS Section 4.7 and Appendix D.

Written Comment 54B:

In Section 3.1.2.1, CRA stated that further discussion is required for impacts due to highly erodible soils and construction on steep slopes. In response, the applicant referenced the Stormwater Pollution Prevention Plan (SWPPP) to minimize impacts. This response was found to be inadequate.

Response to Written Comment 54B:

The Preliminary SWPPP included in Appendix C of the DEIS provides a soil resource summary, and lists those soils found within the limits of the Project (including those that are highly erodible and/or have steep slopes). In consultation with NYSDEC and County Soil and Water Conservation District personnel, the Project Sponsor will finalize the SWPPP and include site-specific measures to minimize and/or mitigate impacts to soils that are highly erodible and/or have steep slopes. Mitigation measures are anticipated to include minimizing disturbance, minimizing removal of vegetation, mulching, and quickly establishing plant cover.

Written Comment 54C:

In regards to the Preliminary Geotechnical Evaluation and Section 3.1, CRA previously requested further discussion of the seven boring locations, which were based on the original turbine layout, as follows:

- a. Justification to support the boring locations.
- b. How the locations were selected.
- c. How the change in layout affects the results due to turbines now located outside the original borings.

The applicant's response was found inadequate.

Response to Written Comment 54C:

As discussed in Section 3.1.1 of the DEIS, *"It should be noted that several turbine locations have changed since GZA conducted the preliminary test borings. However, at this stage of Project development it is typical to perform a limited number of borings in order to understand the range of subsurface conditions likely to be encountered. Prior to Project construction, geotechnical borings will be performed at all turbine locations to fully understand any subsurface conditions that may be at*

variance to those conditions typical of the overall site. This information will be used to support the final structural design of the Project.”

When discussing potential impacts, DEIS Section 3.2.1 states, “*Based on the information provided in the Preliminary Geotechnical Investigation, it is fully anticipated that all turbine foundations will be competent and will be constructed without any undue adverse impact to geology. Only temporary, minor impacts to physiography and geology are expected as a result of construction activities. For example, some cut and fill or addition of fill will be required at some turbine sites and along some access roads; however, the impact to overall topography will be minor.*”

As indicated in the Preliminary Geotechnical Evaluation (DEIS Appendix B), “*the locations of the completed test borings were originally chosen based on representative subsurface conditions (e.g., bedrock, soil type, etc.) anticipated for the Site as well as drill rig accessibility. The data obtained from the test borings is relevant and applicable for the purposes of this preliminary geotechnical investigation of the Study Area.*” In other words, the boring locations documented in the DEIS are representative of the larger Project (Study) Area, and based on this information a reasonable analysis of existing conditions and potential impacts has been presented, in accordance with SEQRA requirements.

In order to support final structural design, geotechnical borings will be performed at all turbine locations. Once final borings and foundation design is complete, the Project Sponsor will provide this information to the Town for their records.

Written Comment 54II:

Provide more information regarding how blasting would be regulated, including number of occurrences (one per foundation or 100 per foundation) and how frequently would blasting occur (every five minutes, every five hours, etc.).

Response to Written Comment 54II:

As indicated above, blasting is not anticipated. However, if blasting is necessary, there will only be one (1) occurrence of blasting per turbine location. A drill will be set up to drill around the perimeter and across the center of the foundation. Charges will then be loaded and the actual blast would occur.

Written Comment 54JJ:

Blasting Plan, Appendix A, states that blasted rock or boulders will be broken into a well graded mixture. Describe how this will be accomplished and whether there will be any additional impacts, including noise and dust.

Response to Written Comment 54JJ:

The Blasting Subcontractor will establish charge strength and pattern at all locations to obtain a size and grade of material that may be removed using conventional excavating equipment. As a result, sorting and crushing using mechanical equipment is not anticipated. By leaving the over burden over the rock, you reduce any dust that may occur from the blast. When the blast is set off, you typically experience more of a “rumble” noise than an “explosion.”

Written Comment 54OO:

- State by tax map parcel the location of the agricultural land along the transmission route site.
- DEIS p. 221 states “...the proposed location of two wind turbines and the collection station are within Agricultural District 7.” Figure 8 appears to show 4 turbines within the district. State by number which turbines are in Agricultural District 7.
- The discussion of impact to agricultural land addresses only parcels that are located in Agricultural District 7. Will the project affect any other land that is used for agriculture, regardless of whether or not it is located in an Agricultural District?

Response to Written Comment 54OO:

The transmission route crosses agricultural land on tax map parcels 102.002-1-36.23 and 1003.001-1-7. Additionally, agricultural land occurs on parcel 102.002-1-36.1; however, although the transmission line crosses this parcel, it does not cross the portion of the parcel that is in agricultural use.

Turbine 6E and 8E are the only two turbines located within Agricultural District 7. However, the center points of Turbines 5E and 7E are located immediately adjacent to Agricultural District 7 and portions of their associated workspaces will fall within it.

Land in agricultural use that will be directly impacted by the proposed project is limited to the two previously identified crossings of agricultural land by the transmission route. Neither of these crossings are located within Agricultural District 7. Portions of Agricultural District 7 that may be impacted by the Project are currently forested.

Written Comment 56A:

The proposed layout of the electric transmission system as illustrated on the small-scale planimetric layout map does not allow for adequate review of potential impacts to agricultural soils. The Department [of Agriculture and Markets (NYSDAM)] strongly recommends that in addition to the proposed geotechnical investigation, a thorough soils investigation be conducted along agricultural portions of the buried electric transmission line routes by a professional soil scientist. Soil types in the two buried transmission line locations described above are fragipan restricted, are poorly drained and have shallow depths to water table. The soil types in agricultural portions of the buried transmission line route should be identified and field delineated to allow for a more accurate assessment of physical and soil characteristics and in order to develop adequate mitigative measures.

Response to Written Comment 56A:

Rather than conduct a site-specific soils investigation, the Applicant has indicated that they will assume that the poorly drained, fragipan restricted soil types described above occur in the agricultural fields scheduled to be crossed by the buried transmission line. The potential problems associated with excavation into soils with a fragipan and perched water table (i.e., creation of a subsurface drainage envelope) will thus be anticipated, and appropriate mitigation measures (i.e., installation of trench breakers) required during construction. Telephone correspondence with NYSDAM staff confirmed that this approach is acceptable and would address their concern.

Written Comment 56B:

It is recommended that the Project Applicant install trench breakers along moderate to steep slopes coming into agricultural fields in accordance with the spacing intervals as detailed on the Sample Drawing A-12 "Trench Beaker Spacing" contained in the Department's Standards for *Pipeline Right-of-Way Construction Projects*. Although these *Standards* were originally developed for natural gas pipeline right-of-way construction activities, the same principles apply to the 'linear' nature of construction associated with buried electrical transmission line installation in agricultural fields. The Project Applicant shall also record each installed trench breaker location by map referenced station number. In agricultural lands, the top of trench breaker will not be closer than two feet from the restored surface. Additional subsurface drainage may be required following installation of buried electrical transmission lines in order to effectively alleviate wet areas along the buried transmission line right of way and to convey trench water to a stable surface outlet. The Project Applicant should make necessary provisions for post-construction drainage repairs in agricultural fields. Because of potential limitations on slope, topography and other surface features, it may be necessary to install

drainage structures and corresponding outlets in locations outside of the Project Applicant's "permitted" ROW. The Department recommends that the Project Applicant make necessary arrangements with the Town, other Permitting Agencies and with individual landowners to allow for flexibility to install drainage features outside of the "permitted" electrical transmission ROW. In some cases, drainage easements may be necessary for off-ROW subsurface drain outlets. Electrical transmission line "runs" will require close monitoring for evidence of seeps, waterboils and other wet areas during the 2-year monitoring period.

Response to Written Comment 56B:

As indicated in the response to Comment 56A, the Applicant will require the insulation of trench breakers in agricultural fields being crossed by the buried transmission line. The Applicant will also require trench breakers along slopes into agricultural fields as suggested in the comment. Construction specifications will indicate that the trench breakers shall be installed in accordance with the NYSDAM's standards for *Pipeline Right-of-Way Construction Projects*. All other recommendations included in this comment (i.e., recording the location of installed trench breakers, minimum depth of trench breakers) will be implemented by the Applicant. Two years of post-construction monitoring, in accordance with NYSDAM *Agricultural Protection Guidelines*, will also be required. This monitoring effort will identify any drainage repairs that may be required after the project is complete. How these repairs are made will be determined through discussions with the affected landowners and NYSDAM staff.

Written Comment 56C:

The FEIS should include a detailed description of how topsoil protection measures will be carried out with each proposed buried transmission line installation method in agricultural fields. In addition, construction drawings should clearly specify the minimum burial depth of four feet in agricultural fields. Although *Department Guidelines* require topsoil stripping and segregation on more than two parallel circuits installed by trenching, due to the thinness of topsoil layer, or A-Horizon, the Department strongly recommends that topsoil protection measures be implemented along all buried transmission lines located in agricultural fields.

Response to Written Comment 56C:

Although in agricultural fields a buried transmission line is typically installed using a trencher, topsoil will be protected during installation of the buried transmission line no matter what method is used by following NYSDAM *Agricultural Protection Guidelines*. Topsoil will be stripped and segregated from subsoil during all trenching in agricultural fields, and the buried transmission line will be installed to a minimum depth of 4 feet in such fields.

Written Comment 56D:

The Department recommends that the project Applicant prepare a detailed description of agricultural restoration activities including drain tile repair, decompaction, waste rock (>4" dia.) removal (rock uplifted during decompaction), replacement spreading, landfitting, required soil amendments (lime & fertilizer) and seeding for final restoration on agricultural lands.

Response to Written Comment 56D:

Restoration of agricultural soils disturbed during trenching will follow NYSDAM *Agricultural Protection Guidelines*. These *Guidelines* require drainage tile repair, soil decompaction, rock picking from subsoil and topsoil, and re-spreading and seeding of topsoil to reestablish pre-construction contours within agricultural fields.

Written Comment 56E:

In addition to the buried transmission line assessment items discussed above, the Department recommends that the Project Applicant develop a comprehensive subsurface drain tile repair plan in consultation with the County Soil & Water Conservation District office. In accordance with *Department Guidelines*, new subsurface drain lines shall be AASHTO M252 single wall drain line and shall be installed in accordance with the applicable USDA-Natural Resource Conservation Service (NRCS) Conservation Practice Standard for "Subsurface Drain" (606). ASTM F405 may not be used in agricultural lands for this drain tile application. Tile outlets shall be constructed of Schedule 80 PVC and steel animal guards should be installed far enough in the pipe to allow it to swivel up and let debris pass without exposing the animal guard beyond the pipe outlet. A "splash rock" should be installed beneath the pipe outlet to dissipate the erosive forces of the discharge water from the drain tile and to prevent scouring from occurring beneath the outlet. Installation of substandard materials may warrant the removal and replacement with the required materials identified above. Department staff should be notified when existing subsurface drain lines are first encountered during construction and also be notified in advance to witness drain tile repair activities.

Response to Written Comment 56E:

The Applicant will coordinate with landowners to locate drain tile in advance of construction activities. When/if a subsurface drainage line is cut or damaged during installation of the buried transmission line, it will be repaired in accordance with section drawings included in the NYSDAM's standards for *Pipeline Right-of-Way Construction Projects* and guidance provided by the County Soil and Water Conservation District Office. Conservation District staff and NYSDAM staff will be notified when subsurface drain lines are first encountered and offered the opportunity to witness repair

activities. Full replacement or installation of new subsurface drainage lines is not anticipated to be necessary. However if required, installation of new lines will be in accordance with the NRCS Conservation Practice Standard for "Subsurface Drain" (606).

Written Comment 56F:

Effective agricultural land restoration, in addition to the basic implementation of sound practices, is dependent on workable soil conditions. The soil materials (whether topsoil or subsoil/substratum need to be in a "friable" state of soil consistence-not "plastic" or "liquid" if restoration is to be successful. In addition to general scheduling of initial restoration, the FEIS should explain how agricultural restoration will be controlled to avoid: attempted ripping (decompaction), subsoiling and soil replacement when soils are at a moisture level too high for effective shattering and replacement spreading; preventing tight clumping/compaction and long-term damage of the soil resource.

Response to Written Comment 56F:

In accordance with NYSDAM *Guidelines*, site restoration activities will only occur when soils are in a friable condition. Restoration will be scheduled and undertaken only at times of the year when soils are dry enough to allow for effective decompaction, replacement, and spreading of both subsoil and topsoil. The Applicant shall provide funding for an Environmental Monitor hired by the Town for the duration of the Project. The Environmental Monitor shall either be qualified to act as the Agricultural Monitor or be responsible for engaging qualified personnel to fulfill the needs. The Environmental Monitor will ensure that all agricultural restoration activities are carried out under proper soil conditions.

Written Comment 56G:

Agricultural lands which had been stripped of topsoil and altered by temporary/permanent roadway access and buried transmission line installation require close on-site inspection/supervision of all aspects of landfitting and soil replacement including the following:

- rough re-grading of the exposed subsoil (prior to deep-ripping),
- deep-ripping a minimum of 18-inches depth through all exposed areas of subsoil prior to rock picking and topsoil replacement,
- thorough rock picking, followed by topsoil replacement no thinner than the original layer,
- deep subsoiling, or deep ripping the refitted soil profile through the topsoil layer down into the subsoil for a minimum depth of 18-inches from the surface, revegetation of lands that are in extended hay or pasture cycle, with appropriate seed mix, lime and fertilizer,

- ensuring that each phase outlined above is carried out during friable soil conditions (not in a plastic nor liquid state of soil consistence) or postponed until the return of workable field conditions.

Although the control of chronic saturation, resulting from excavation through vulnerable soils (with a seasonable perched water table or vertical flow restrictive fragipan) may be considered a restoration activity, it is usually limited, during the initial year, to specific segments of the buried electric transmission line segments where an “in-trench” interceptor drain line is feasible. Most other trench zones and areas of excavation or cut-and-fill disturbance resulting in seepage/saturation are more commonly mitigated during follow-up monitoring and remediation.

Response to Written Comment 56G:

On-site monitoring by the qualified Environmental Monitor will ensure that all agricultural restoration activities are carried out in accordance with NYSDAM *Agricultural Protection Guidelines*. These *Guidelines* include all of the requirements listed in this comment.

Written Comment 56H:

For a period extending not less than two years after the completion of the Project’s initial restoration work, agricultural lands disturbed by the Project activity are to be completely monitored for the effectiveness of initial restoration. Within the same two-year period, locations where initial restoration is incomplete or otherwise deemed inadequate are to be remediated.

Agricultural lands will be monitored for such problems as:

- chronic seeps/saturation created or expanded by project activity,
- average soil-profile density in excess of the adjacent unaffected portions of the site,
- surface drainage problems from access corridors (where drainage is either impeded or concentrated),
- weak or sparse revegetation of haylands and pasturelands,
- replaced topsoil at 90 percent or less thickness than adjacent, unaffected land,
- excess oversized (>4”) waste rock,
- lack of full recovery of crop development/productivity (seasonally assessed in the late spring, summer and early autumn),
- inadequacy of fence repairs/access gates.

Situations which are monitored and found to be at less than satisfactory level of restoration will be remedied by the Project, under technically competent, experienced field inspection/supervision. The Department will field-check the monitoring and remediation work in affected agricultural lands.

Response to Written Comment 56H:

As indicated in Response to Comment 56B, the Applicant will be required to conduct two years of post-construction monitoring in accordance with NYSDAM *Agricultural Protection Guidelines*. This monitoring will ensure that site restoration has been successful and effective. If problems such as those outlined in the comment above are observed during this monitoring effort, the problems will be remediated under the supervision under the Project Environmental/Agricultural Monitor, and in consultation with the affected landowner and NYSDAM staff.

Written Comment 56I:

It is requested that the Project Applicant advise the Department regarding the review of items requested above, tentative Project planning, pre-construction meetings and for contractor site walks of the proposed work areas prior to the commencement of construction activities. The Project Applicant is encouraged to closely coordinate with the Department to review additionally requested information and develop an appropriate schedule for site inspections to assure the Department's *Guidelines* and construction standards are being met.

Response to Written Comment 56I:

The Environmental Monitor will notify the NYSDAM of Project status and closely coordinate with NYSDAM staff on a regular basis. NYSDAM staff will be invited to participate in pre-construction meetings and site walk-overs and join the Environmental Monitor in observing construction activity throughout Project construction and site restoration.