

4.8 SOUND

Written Comment 1AA:

The NYS DEC policy document, "Assessing and Mitigating Noise Impacts" places stress on reducing impacts above background levels. And this is emphasized in the DEIS. Moreover, the applicant employs the more conservative L90 metric in the analysis which is to be commended. As determining the impact of the proposed wind farm on the local community depends on accurately determining existing background levels, an analysis should carefully justify the number of chosen background sampling points, their specific location, and any factors which may have an influence on the respective result. As the project area spans over 9,000 acres, the background analysis should include a justification for the number of sampling locations chosen based on statistical analysis of what would be representative of such a large area. In a rough fashion, the clusters of home possibly affected by the wind project in terms of noise would include, clockwise from the north: 1) homes along Upper Birch Road; 2) homes in the proximity of Boulder Ridge Road; 3) homes along Geiger Hollow Road; 4) homes near the intersection of Bucher Hollow Road; 5) homes near the intersection of Knapp Creek Road; 6) homes in Nichols Run; 7) homes in Harrisburg; 8) homes in the west along Nichols Run near the intersection of Quinn Road; 9) homes in the proximity of Chipmunk. Of these, 2), 3), 5), 6), 7), and 8) would appear to be closest (though topography needs to be considered and proximity may not be perfectly indicative of effect). Moreover, homes in the vicinity of Geiger Hollow Road and west along Nichols Run near the intersection of Quinn Road have no representation in background analysis. For a project spanning such a large area, the background analysis should include discussion of the following question – do we have enough data to characterize the background in the area of each cluster of homes? Moreover, additional background analysis points may be called for given the nearly 20 dBA divergence between readings that occasionally occurred at the same time between background points. Also, it may be advised to analyze each identifiable cluster of homes which could be affected and present the respective existing background levels along with potential impacts from the wind project. While Plot 1 does take considerable steps towards addressing this question, a closer look at the home clusters within the anticipated 40 dBA line or in close proximity to it would be helpful in better characterizing potential community impacts.

Response to Written Comment 1AA:

Although the overall Allegany project area is fairly large, the size of the area itself does not necessarily dictate the number of monitoring positions. In this case, monitors were located

so as to be representative of the nearest residences or groups of residences to the turbines as they were arrayed at the time of the survey. This is consistent with the requirements of SEQRA, and the intent of the local law to protect off-site property. The homes in the Project area are at a dramatically lower elevation than the Project at the bottom of a steep grade making the sound propagation path significantly longer than it appears on a two-dimensional site map. The results of the background surveys indicate that all of the monitoring stations located in valley bottoms or at the foot of the mountain showed uniform sound levels at any given time. It is reasonable to rely on this extensive and representative sampling of project background levels to determine such levels for similarly situated valley locations including the two additional locations identified by the commentator. In fact, it is a common finding in such surveys that environmental sound levels in rural areas, remote from any prominent man-made noise sources, are quite uniform over surprisingly large areas. Consequently, it is reasonable to infer that the design L90 level used to generally characterize residences at the foot of the mountain also reasonably represents these additional residential areas with similar settings.

While the levels were similar at the valley monitoring stations they were not exactly the same at the same time, as would be expected in any real-world situation. However, over the two week survey period the levels intertwined with each other and no single position was consistently louder or quieter than the others or the mean, so the average was taken as a representative design value.

Written Comment 1BB:

The DEC recommends a more detailed discussion of any factors that may cause a given location to be influenced towards a less conservative ambient level. Such factors should include work or hobbies conducted nearby (such as tractor or ATV use), traffic on nearby roads, higher wind levels (due to elevation and exposure), and quite a few other possibilities including brook noise as discussed by the applicant. Background levels are, of course, influenced by such factors as road noise and wind, but it is important that the applicant explain the choice of locations with care to show that the results could not be unduly biased towards higher readings by non-representative events.

Given the majority of the background sampling points were in close proximity to roads, more so than nearby homes, some discussion of this influence, as well as other activities in the nearby area, should be discussed. For example, do nearby residents use tractors or ATVs? How heavy is the car and truck traffic on the nearby road? While stream noise is natural in

the vicinity of many of the homes, the fact that the work was done in the Spring during greatest flow may raise some questions of how representative the background would be over the course of the entire year.

Response to Written Comment 1BB:

In general, the background sound level at any given location is influenced by nearby roads, natural phenomena or intermittent human activity. The L90 statistical level was sought in the survey because it filters out sporadic sounds from cars passing by (or other intermittent human activities such as snowmobiles), wind gusts or short-lived local noise events and records the actual “background” sound level that is consistently present between these kinds of events and available to potentially mask project noise, thereby resulting in a conservative estimate of background noise. It is only natural for there to be noises from intermittent traffic on roads, snow blowers or other human activities during the survey but these contaminating events are largely excluded not only by application of the L90 but also by the lengthy duration of the survey, where sound levels are recorded continuously day and night for about 15 days. Human activity is normally negligible late at night.

In this survey, most of the valley receptor positions were affected for part of the survey by the sound of local streams due to runoff from snow and rain. All of the data where this influence was present (and it can clearly be seen in the level vs. time plots) were excluded from the analysis so as to not bias the results. There is no question that this naturally occurring noise was present but it was excluded on the premise that it is not always there.

Because it is not possible to actually measure over an entire year a shorter sampling period has to be relied on for practical reasons to represent the local environment on a permanent or annual basis. To be conservative, such surveys are deliberately carried out during the cold weather season when the trees are bare (eliminating leaf rustle), there are no insects present and human activity is generally at an annual minimum. Surveys conducted during both the summer and winter at other wind project sites consistently show that sound levels are substantially lower in the winter; consequently, the survey carried out for this project in February is considered to be a conservative representation of the year-round local environment and probably significantly underestimates summertime levels.

Written Comment 1CC:

Moreover, while pictures were provided from two perspectives, it would be preferable to have photos to cover a 360 degree view, or at least multiple vantage points. Furthermore, it should be kept in mind that some (possibly many) residences may be in relatively wind sheltered locations while still being within a reasonable distance of the turbines. If this is the case, and background survey locations do not reflect this, the difference between background and wind turbine generator sound levels may be greater than anticipated.

Response to Written Comment 1CC:

The pictures of the monitoring positions were generally taken from two opposing points of view to show their proximity to the nearest homes and the general setting. For additional visual information see DEIS Appendix K and FEIS Appendix E. Additional pictures or 360 degree panoramas are not available and, in any event, would not reveal anything of significance not already shown in the current photographs relative to noise.

The second aspect of this comment expresses a concern that many of the homes at the foot of the mountain are sheltered from the wind and would tend to have relatively low background levels while the turbines on the ridge top are operating – therefore increasing their perceptibility. This possibility has been addressed in the analysis by measuring the wind speed-sound level at a 150 ft. tall met tower on the ridge top and correlating these sound level measurements to same-time sound measurements in the sheltered valley areas. Thus the wind speed that the turbines would be exposed to is directly correlated to the concurrent sound level measured at ground level in the sheltered valleys, where the wind speed may well have been negligible much of the time.

The following comments are concerns regarding wind turbine amplitude modulation.**Written Comment 1DD:**

Appendix N, Environmental Sound Survey, discusses that sound from wind turbines as unsteady and variable and periodic thus can be discerned at larger distances than if it were continuous (page 26). The characteristic of the sound generated is important in considering its impact on the public (as discussed in our guidelines). As wind turbine generator noise is characterized by amplitude modulation (whooshing, for example), this should be considered in the analysis as some studies have shown amplitude modulation as an annoyance factor for the public. In this light, per the “Factors to Consider” section (under “Evaluation of Sound Characteristics”) of the DEC guidelines, it may be advisable

to add a calculated number of dBA to the generated sound in an attempt to compensate for this characteristic.

Written Comment 4E:

NYSDEC provides guidelines for assessing and mitigating noise impacts, and I have attached a copy of these comments. According to the DEC, noise impacts should be addressed under a worst-case scenario. The absence of any wind masking, when there is wind at elevation and little or no wind at ground level (called “wind shear”), is a common occurrence and therefore should be assumed in any worst case scenario. Different wind speeds within the rotor-swept area is also a common occurrence, and results in low-frequency “thumping” sounds, which carry long distances. These sounds are also not well masked by even wind-related sounds at ground level, which are broad band sounds. Broad band noise does not cover up low frequency beating sounds, because the two kinds of sounds are very different.

Response to Written Comments 1DD and 4E:

Wind turbine noise is sometimes characterized by amplitude modulation, or a periodic swishing sound, that makes it more perceptible than a steady sound with the same magnitude and most complaints about turbine noise tend to involve this quality in one way or another. This phenomenon is not continuous, however, and occurs sporadically and variably depending on atmospheric conditions or other factors. If it happened all the time one might consider it to be similar in nature to a tonal or impulsive sound and apply a 5 dBA penalty - but it does not happen all the time and the application of a 5 dBA factor (added to the predicted level, for example) would dramatically increase and probably overstate the apparent impact of this or most wind projects.

Because it is difficult to deal with numerically, the Appendix N assessment discusses the issue verbally and frankly describes the nature of wind turbine noise in an effort to convey an idea of what might be expected. No claim is made that absolutely no annoyance will result from this phenomenon; however, amplitude modulation is largely universal at all similar wind projects and field tests of completed projects in New York and elsewhere indicate that complaints are few at the sound levels predicted for the Allegany project at the nearest homes. In other words, when the intermittently adverse character of wind turbine noise is combined with relatively high mean predicted sound levels of about 45 dBA or more complaints can be expected, but when the mean sound level is lower, particularly when it is lower than 40 dBA, adverse reaction is usually minimal. Levels of

about 40 dBA or, in the vast majority of cases, less, are predicted at the majority of homes (participating and non-participating) within the environs of the Project area.

Written Comment 1EE:

As our guidelines discuss (below), given situations which involve nighttime noise (such as that generated by wind projects), a discussion of impacts on residents should consider possible disruption during the night. As mentioned below in the quote from our Guidelines, weighting nighttime noise more heavily, such as the Ldn, may be appropriate as a supplemental means to assess possible effects on local residents. As stated in our guidelines:

“...Equivalent Sound Level (Leq)...can be combined with other types of noise analyses such as Composite Noise Rating, Community Noise Equivalent Level and day-night noise levels characterized by Ldn where an Leq(24) is measured and 10 dBA is added to all noise levels measured between 10 pm and 7 am. These different types of noise analyses basically combine noise measurements into measures of cumulative noise exposure and may weight noise occurring at different times by adding decibels to the actual decibel level. Some of these analyses require more complex noise analysis than is mentioned in this guidance.”

However, care should be taken that this approach not substitute for analysis involving short term worst case analysis – such as worst case 10 minute nighttime sound pressure level.

Response to Written Comment 1EE:

While the Ldn, or day-night average sound level, has long been used for assessing potential nighttime impacts from road noise or conventional industrial noise sources it is very difficult to apply to wind turbine projects for the principal reason that it is based on the hourly Leq background level, which is almost always dramatically higher than the 10 minute L90 sound level normally used for wind projects, since the Leq is highly sensitive to sporadic noises from cars, planes and wind gusts etc. Such an analysis would tend to (erroneously) predict a relatively low potential for adverse impact because the background level, even after accounting for the nighttime weighting factor, would be quite high while wind turbine sound levels even at minimal set back distances are relatively low.

In some instances (other similar wind projects), a day-night dependency to the background sound levels is evident and the nighttime L90 levels are used as the design basis for the project - but in this case no significant day-night dependence was observed and all of the

data, recorded both during the day and at night, were used in evaluating the correlation between L90 sound levels and high altitude wind speed. Because the nighttime levels were substantially similar to the daytime levels it is likely that the same relationship between sound and wind speed would have been arrived at if only the nighttime data were used. Apart from such an analysis, there isn't any practical or proven way of numerically accounting for nighttime conditions; consequently, this phenomenon is verbally discussed in Appendix N of the DEIS.

Written Comment 1FF:

Moreover, while the analysis does assume stability according to Mr. Hessler, a Swedish study does indicate ("Human Response to Wind Turbine Noise", Eja Pedersen, Goteborgs Universitet, 2007) that an additional complicating factor may be at play; wind velocity may be nearly double that anticipated at hub height during nighttime stable atmospheric conditions. Thus resultant sound levels might be much higher than anticipated relative to background. In any case, whether this proves to be an issue or not, care should be taken to compare likely lower background noise levels at night and consequent possible higher spreads between background and wind turbine generated sound at a time when annoyance may be greatest. Stable atmospheric conditions at night when the difference between ground level wind and hub height wind speeds may be most pronounced should be carefully examined.

Response to Written Comment 1FF:

Wind turbines are commonly more perceptible at night not only because of atmospheric stability, which enhances sound propagation, but also because at sites where the terrain is largely flat the wind shear gradient normally becomes more slanted during the night; i.e. the wind speed is generally higher aloft and lower near the ground, whereas during the day there is usually much less of a difference. There is also less filtering noise at night. Differing wind speeds over the vertical rotor plane are thought to produce or enhance the production of modulating sound (swishing). At mountainous sites where the turbines are situated on the crest of a ridge, as they are at Allegany, the wind shear profile will not normally exhibit the same kind of a regular or predictable pattern because of the wind's interaction with the topography. For example, slower low elevation airflow would tend to become compressed and accelerated as it is directed upwards by the windward mountain slope so that at the crest there wouldn't normally be much vertical stratification therefore minimizing the likelihood of increased noise from amplitude modulation.

Atmospheric stability, on the other hand, refers to the thermal gradient or temperature profile in the atmosphere. Sound propagation is enhanced when warmer air exists on top of cooler air and the atmosphere is said to be stable. This situation - a temperature inversion - normally develops only when the winds are fairly light, if not completely calm, because even moderate winds disrupt the thermal stratification by mixing and blending the air masses, particularly when mountainous terrain is involved. It is usually on very calm summer evenings that inversions occur making very distant sounds, such as from distant traffic, remarkably more audible than they otherwise would be. However, in the moderately windy conditions needed for turbine operation enhanced sound propagation due to a stable atmosphere is less likely – although certainly not impossible as described by Van den Berg and others.

The fact of the matter is that conditions will occasionally develop, whether due to wind or temperature gradients, when project noise becomes more perceptible than it is at most other times. During these periods, which do not lend themselves to numerical prediction in terms of either frequency or magnitude, a greater potential for annoyance is likely to exist.

As to this Project site, as discussed above topography is an important element to consider. The wind shear gradient behaves differently where the turbines are arranged along a ridge. More specifically, the mountainsides tend to compress the incoming airflow so that the highest velocity may well occur near ground level at the top of the crest. Consequently, the shape of the gradient would tend to be more flat (straight up and down) at turbine locations than slanted. The flatter it is the less noise is developed and vice versa. At sites without mountainous terrain ground drag tends to exaggerate the "slant" in the gradient curve.

In addition, as indicated in the Hessler Reports the site-specific field survey correlated the wind speed measured by the highest anemometer on the met mast on the ridge top to the concurrent sound levels measured in the sheltered valleys, where, in many cases, the local wind speed was virtually negligible while the wind speed at the met tower was significant. Despite the utterly different exposures of these two locations to the wind, a strong correlation between wind and sound was observed. In other words, when it was windy at the top of the met mast it was relatively noisy down in the valleys, even though it may not have been particularly windy there. What was not observed was extremely quiet sound levels at the valley monitoring stations while it was windy on the ridge crest. It is this latter scenario that is evidently being asserted (without evidence) by the comments as occurring "most of

the time," whereas it was generally not seen at all during the survey, as may be seen in the regression plots in the Hessler Report.

Written Comment 1GG:

The sound study provided by the applicant assumes that wind turbine generators (WTG) will act as a point source in generating sound. However, as WTG are commonly configured in a line, noise may not drop off as quickly as possibly assumed. It is not clear if this consideration is examined.

Furthermore, particularly at night, wind speeds may be relatively uniform and thus a synchronicity in the sound from various WTGs may result in an unexpected additive effect from an "in phase" generation of sound from the various WTGs. This is particularly the case since WTB blades are at most 60 degrees out of phase

Response to Written Comment 1GG:

The turbines in the project are modeled as point sources and field measurements of completed projects where the turbines were both randomly arrayed and laid out in lines confirm that this is the correct methodology. The presence of other nearby units does not alter the physics of sound radiation from a particular unit. Traffic noise on a busy road is one of the few sound sources that behaves as a line source with the noise radiating outward with cylindrical wave fronts, but this is because the noise is being generated by many small sources strung out almost continuously along the road. Noise from sporadically travelled roads does not behave in this way and each car can be considered a discrete source radiating noise in a hemispherical pattern. Large modern wind turbines, even when arranged in perfectly straight rows, are normally spaced a minimum of 1000 ft. from each other for air flow reasons, which prevents them from acting as a line source. For the proposed Project, wind turbines are spaced an average of 1,215 ft. apart and follow the ridgeline, therefore they are not aligned in perfectly straight rows. The notion of line source radiation apparently originated in a 20 year old paper by Hubbard and Shepherd (*Wind Turbine Acoustics*, NASA Technical Paper 3057 DOE/NASA 20320-77, Dec. 1990) where line source radiation was assumed for a desktop analysis (and not measured) but the turbine array being evaluated was a hypothetical line 900 m long of very small turbines with 15 m rotors lined up almost tip to tip.

In general, each turbine rotor turns independently and neighboring units can, for all intents and purposes, be considered incoherent or non-synchronous noise sources. Having said

that, however, it is possible that during conditions that support the generation of amplitude modulation noise that adjacent rotors could temporarily turn in unison reinforcing the magnitude of the sound, but it would likely be a short-lived or passing phenomenon. Most of time adjacent units operate out of phase which actually dulls the perceptibility of periodic noise and makes the overall sound more continuous and less obtrusive in nature.

Written Comment 1HH:

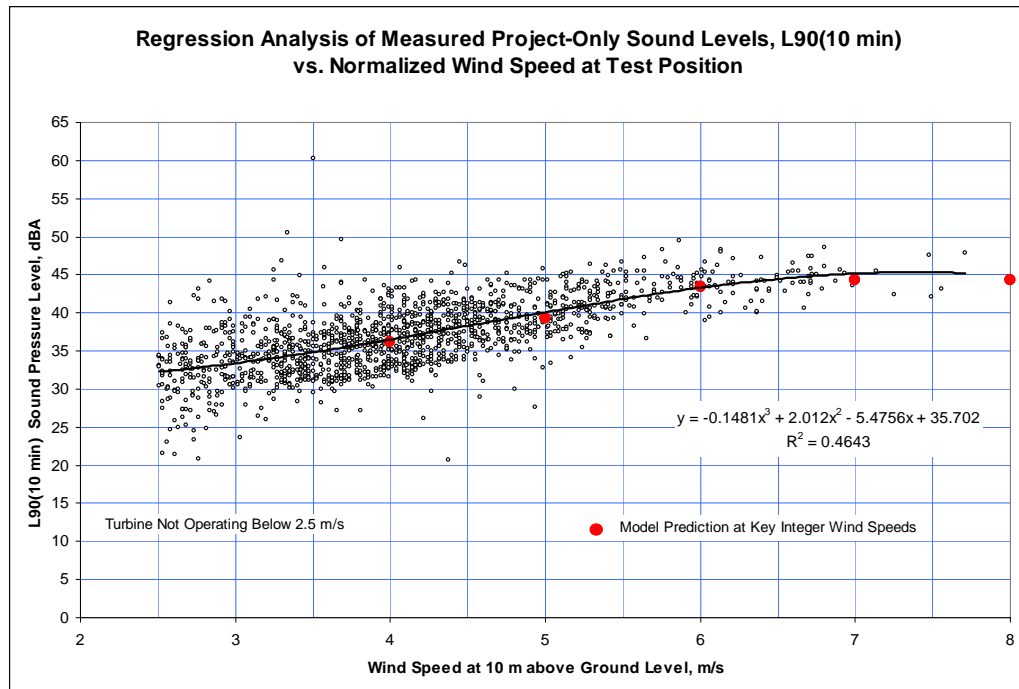
Error is a component of any study. Some discussion is encouraged to focus on the likely degree of measurement and model error. An analysis should be included in the Final Environmental Impact Assessment to ensure that the results are not in danger of underestimating possible impacts. One possible source of error to discuss is the fact that sampling represented only several days and this may not represent atmospheric conditions common over the course of a year.

Response to Written Comment 1HH:

This sort of an impact assessment is certainly not an exact science and some error is inevitable in the both the quantification of the environmental background sound levels and in the prediction of future project noise. As mentioned above, it is not practical to measure over an entire year to establish the local background sound level and even if it were the question would arise whether that year was representative of all years. Consequently, for reasons of practical necessity a 15 day survey was carried out. In order to allow for an unknown amount of variance throughout a typical year the survey was carried out in the middle of the winter when background sound levels (from leaves, streams etc) are generally known to be at an annual minimum and natural sound buffering (grass, leaves, ground absorption etc.) is less present. These wintertime results were then taken as a conservative design basis for the entire year. This approach essentially leaves room for error, which could not be mathematically evaluated in any case without further data measured at other times of year, by assuming a low background level that is unfavorable to the project.

In terms of prediction error, the modeling software is simply an automated version of ISO 9613-2 *Acoustics – Attenuation of sound during propagation outdoors*. This standard contains its own error analysis in Section 9 where the accuracy of the methodology is given as +/- 3 dBA for sources that are less than 30 m above ground level and up to 1000 m from the source. In this case, the turbines are out of this range at 80 m above ground level implying a somewhat wider error margin than +/- 3 dBA at large distances. It is not that the standard is invalid for situations with higher sources or longer prediction distances, it's just

that a specific error margin is not given. Numerous comparisons between modeled sound levels from typical wind projects (with turbines at 80 m hub heights) and actual measurements strongly indicate that the actual accuracy of this prediction methodology is much higher than suggested by the standard itself, probably because of the intrinsic simplicity of wind turbine modeling where basic point sources are essentially suspended in the air and the only propagation factors of any consequence are distance, air and ground absorption. As an example, the plot below compares the measured project only sound levels at a typical residence within an operating project in New York close to a number of turbines with the model predictions (red dots) for that location for winds speeds ranging from 4 to 8 m/s.



This plot illustrates the common finding that the model predictions closely match, within about +/- 1 dBA, the mean trend line through the measured data. The scatter in the measured data is due to variations in both the source sound level caused by variable wind conditions at the rotors and path effects due to intervening atmospheric effects. What the model is predicting, rather accurately, is the mean or most likely project sound level for a given wind speed.

Written Comment 3A:

As a follow-up to Mr. Ebbing's February 2 presentation to you and the Board, please accept these preliminary comments on the scope of Everpower's noise assessment on behalf of Concerned Citizens of Cattaraugus County.

I understand that the Board has elected to forgo scoping in this matter, so there should be no expectation by Everpower that the Board will accept without further supplementation reports or studies it submits. In fact Everpower's December 19, 2008 "Environmental Sound Survey and Noise Impact Assessment" prepared by Hessler Associates, Inc. is seriously incomplete.

Response to Written Comment 3A:

As indicated by the Allegany Planning Board Resolution adopted on February 24, 2010 (see Appendix I of this FEIS), the DEIS was released for public review and comment. However, the December 19, 2008 Hessler Associates Report referenced by the commenter was not included in the DEIS, and therefore is not subject to this review. The commenter does not present any useable information about why the report is deficient. The 2008 report was an earlier revision to the final January 27, 2010, Noise Assessment, which was included in the DEIS. All comments on the final report are addressed in this Section of the FEIS. The DEIS (Appendix N) included a noise study on the proposed wind farm ("Environmental Sound Survey And Noise Impact Assessment") for which comments have been received and addressed in this FEIS.

Written Comment 3B:

In his presentation, Mr. Ebbing made three important points about noise assessments that can be summarized as follows:

1. Acoustics standards define background sound levels in a quiet rural community as those sounds that dominate in the area, and transitory sounds such as a babbling brook, trees and brush rustling in the wind, dogs barking, vehicle traffic and overhead airplanes must be excluded from background sound measurements. In communities a mile or more from heavy traffic or industrial uses, background sound levels are generally about 25 dBA, especially at night.
2. Wind speed near ground level is often calm when wind speed at turbine height is sufficient to operate wind turbines. For purposes of measuring background sound levels, it is therefore inappropriate to assume that ground wind speeds will mirror

turbine operating wind speeds (speeds above turbine “cut-in”, or above 3 m/s = 6.7 mph, see Hessler, p. 2), or that wind sufficient to operate a wind turbine will be accompanied by any appreciable ground wind speed. A worst case scenario is no appreciable wind speed at ground level and speeds at turbine height above cut-in. A worst-case noise assessment should not assume any masking effect that would reduce the impact of turbine noise.

3. Ridge line siting of wind turbines magnifies sound impacts for those who live in the adjacent valley. Modeling sound impacts should take this effect into account.

For all three aspects of noise assessments the Hessler report is seriously deficient. Hessler has not offered an assessment of background sound levels around the Everpower project area. Instead, his measurements are contaminated with transitory sounds he failed to exclude when calculating background. There is no discussion or attempt in the Hessler report to assess the effect of turbine noise under stable atmospheric conditions, when there is no appreciable wind speed at ground level and at turbine height wind speeds are sufficient to operate the turbines. The worst case scenario (and how frequently it can be expected, especially in adjacent valleys) was not assessed. Similarly, the acoustic setting of ridge line siting of turbines was not discussed by Hessler. This is another worst case scenario that should be assessed.

Response to Written Comment 3B:

In response to Item 1, the survey was designed to specifically measure the near-minimum background sound levels that are consistently present in the absence of, or in between, the sporadic noise events mentioned in the comment. This was done by using the L90 (10 min) statistical sound level as the design level. The L90 measures the sound level that is exceeded 90% of the measurement period (in other words, the quietest cumulative 60 seconds during each 10 minute measurement). The L90 essentially captures the quiet lulls between such things as cars passing by, planes flying over, or, wind gusts. The idea is to measure the natural sound level that would be consistently present and available to potentially mask project noise. In addition, the survey sought to measure the L90 background sound level as a function of wind speed because the turbines only generate noise when the wind is blowing. The background sound levels during calm and still nighttime conditions may dip into the 20's dBA in rural areas, but this is also a time when the Project is either completely idle or the rotors are only just starting to slowly turn without generating any significant noise. During periods of moderate wind the background level is still quiet but

normally substantially higher; in this case, in the mid-30's dBA for the wind conditions of most interest. By comparison, for estimation purposes, the DEC guidance on noise assessment advises "A quiet seemingly serene setting such as rural farm land will be at the lower end of the scale at about 45 dB(A)." Thus an extremely conservative model has been used; further, operational noise must be considered relative to the actual background sound level that is likely to exist during the conditions necessary for the turbines to operate.

Item 2 incorrectly assumes that the wind speed used to develop the sound level-wind speed correlation was measured at ground level when, in fact, the wind speed was measured at the top of a 150 ft. met mast located on the ridge top. This raw wind speed (effectively the wind speed that the turbines would see) is normalized to a standard wind speed at 10 m above ground level and then compared to the sound levels measured at 1 m above ground level mostly in sheltered valleys where the local wind speed may well have been negligible. Consequently, the wind speed directly associated with turbine operation was compared to the simultaneous background sound level measured essentially at ground level.

The concern in Item 3 is that background sound levels will be low in the valleys because those locations are sheltered from the wind while the turbines on the ridge are exposed to the wind and operating normally – thereby increasing the audibility of the project. As mentioned above, the background levels measured in the sheltered valley locations were correlated directly to the wind speed near hub height. Thus, when it is estimated from the measured data, for example, that the mean (near-minimum) L90 sound level under 7 m/s wind conditions will be 35 dBA it is based on ridge top wind speed and the concurrent conditions in the valleys, which may have been essentially calm. More specifically, the background sound level in the Chipmonk valley at CRA's valley location (identified as L2 in the September 27, 2010 report provided in FEIS Appendix K) is reported as 35 dBA, which happens to agree exactly with the background sound level identified in the *Environmental Sound Survey and Noise Impact Assessment* (DEIS Appendix N). In short, the analysis was fundamentally designed to consider the worst-case situation during Project operation. There is no evidence to support an assertion that "background sound levels are generally about 25 dBA, especially at night" during conditions under which the turbines would be operating.

Written Comment 3C:

These deficiencies should cause the Board to ask Everpower to supplement its noise assessment to specifically address these topics. *The Board should also ask its own*

independent consultants to take measurements of background sound levels near the project area in accordance with accepted acoustic standards and the latest acoustic research.

Response to Written Comment 3C:

The commenter has not identified any deficiencies requiring supplementation. The survey reported in Appendix N of the DEIS was conducted in accordance with professional standards in an impartial way by an independent consultant with extensive wind turbine field experience and with no interest whatsoever in whether the project is approved or not. It is simply a practical necessity that such fieldwork must be funded by the developer. Wind turbine noise is a highly specialized area of study and no ANSI or ISO standards currently exist with respect to measuring background sound levels as a function of wind speed for wind turbine applications. The procedures used in Appendix N have been developed from years of field work at wind project sites both before and after construction. Some of the “latest acoustic research” into wind turbine noise and its measurement in the form of conference papers and peer-reviewed journal articles were written by Hessler Associates, the firm that carried out the field study in Allegany.

Conestoga-Rovers & Associates (CRA) was retained by the Town of Allegany to conduct an Ambient Sound Level Assessment to determine the current ambient sound level in the area of the proposed Allegany Wind Power Project (see FEIS Appendix K). Specifically, the typical ambient sound levels that occur during meteorological conditions when the proposed wind turbines will operate were of interest. To determine the ambient sound level at the three monitoring locations, sound level data was continuously collected, including the sound pressure level exceeded 10 percent of the time (L10) in each hour, the sound pressure level exceeded 90 percent of the time (L90) in each hour, and the one-hour equivalent sound level (Leq).

In comparing the three sound level measurement methods, it is CRA’s opinion that the L90 statistic provides a reasonable metric for establishing pre-turbine minimum ambient sound levels for the Project. The overall average L90 values range from 33 to 35 dBA during the wind condition of interest, which is similar to Hessler’s previous background study that established the overall L90 background levels of 35 dBA in valleys and 37 dBA on exposed ridges, as a function of the 7 m/s wind speed design value. The L90 statistical data for all monitoring locations are clearly representative of a typical acoustic environment.

Written Comment 3D:

We all believe that society should utilize all forms of renewable energy to achieve important social and policy goals. However, the Board should also be interested in getting to the truth about what noise impacts can be reasonably expected from this proposed project. Wind energy may provide an important element of a program to increase renewables, but specific siting proposals should be approved only where it can be shown they will do no significant harm. It may be that Everpower's proposed turbine sites can be moved or otherwise modified to reduce their noise impact. But before considering whether such measures are necessary and will be effective, the truth about expected noise impacts should be before the Board. So far, what Everpower has submitted is incomplete and does not provide a reasonable basis for assessing such impacts.

Response to Written Comment 3D:

The Planning Board believes the DEIS and FEIS, including the responses to the comments and CRA Ambient Sound Level Assessment (Appendix K of the FEIS), present the necessary information to assess noise impacts and the commenter has not demonstrated otherwise.

The following comments are in regards to concerns regarding alleged deficiencies in the Noise study.

Written Comment 3E:

I have asked Richard James to provide a letter (enclosed) attesting to the conformity of Mr. Ebbing's understanding of the issues presented by wind farm noise with accepted acoustic standards and the latest acoustic science. Mr. James also provides preliminary technical comments on the deficiencies in the Hessler report. Mr. James is an acoustic engineer whose work was discussed by Mr. Ebbing. I have also enclosed two papers on siting wind projects to avoid health risks from noise pollution, and a recent news article about a North Country town that has received advice about wind project siting very similar to Ebbing's and James'.

Written Comment 4B:

The project as proposed has not demonstrated it can comply with the stringent noise limits for wind energy projects in the town's Zoning Ordinance II. We are grateful that the Planning Board has identified eight "sensitive receptor" locations that are farther than 2500 feet from the project site, at which the ordinance's limit of 3 decibels (A-weighted, or

dB(A) above background must be met. As more fully discussed in the attached new comments of acoustic engineer Richard James, ambient sound levels at four of these locations are in the low 20s dBA at night, and the ambient sound level is likely to increase by 3 dBA or more under certain meteorological conditions at these locations, where there is no intervening topography.

Written Comment 4F:

These concepts are basic to acoustics. They are identified in the DEC guidelines, which state that impulsive and low frequency sounds will increase annoyance. The way in which wind shear affects elevated sound sources has been identified in criticisms of David Hessler's work, the basis for the DEIS assertions about noise impacts, several times. Mr. James discusses and attaches to his comments a number of these criticisms. Mr. Hessler's failure to address these criticisms is no less than unprofessional, because his approach rejecting these basic concepts is contrary to published standards in acoustics. As a result, the Planning Board has no credible basis to conclude that Everpower can comply with the town's noise limit for wind projects.

Response to Written Comments 3E, 4B, and 4F:

With respect to compliance to the Town's regulations, please see Response to Written Comments 13C, 13D, 23F, 37B, 40A, 40B, 54G, 54R, 54V, 54W, 54X.

With respect to comments prepared by Mr. Rick James, Hessler has prepared a letter report (dated November 9, 2010; Reference: L-110510-A) specifically in response to these comments, and this is included in FEIS Appendix K. As indicated in Hessler's response letter, the various standards and measurement techniques to study sound, as described by Mr. James, do not apply to the special case of studying wind turbine sound emissions and specialized techniques are required for which no standards currently exist. The techniques employed in Hessler's study are based on extensive field experience with wind projects.

On the subject of standards, Mr. James insists that all measurements of wind turbines must adhere to ANSI S12.9-1993/Part 3 *Quantities and Procedures for Description and Measurement of Environmental Sound*, but this standard was not written for wind turbines applications or with the unique nature of wind turbine noise in mind. In particular, this standard prohibits measurements in wind speeds of 5.5 m/s or more whereas measurements in windy conditions are required almost by definition for wind turbines;

given the cut in and operating speeds. Apart from IEC 61400-11, which is exclusively associated with the rigorous quantification of the sound power level from a single isolated wind turbine, there are no standards in existence that address the measurement of general background sound levels for wind turbine projects or the measurement of operational noise from the projects at residences or other points of interest. Mr. Hessler has acted in a professional capacity in this industry for many years and in that time has accumulated a great deal of experience following accepted standards for wind projects

Hessler's background study was designed to specifically measure the near-minimum background sound levels that are consistently present in the absence of, or in between, sporadic noise events. This was done by using the L90 (10 min) statistical sound level as the design level. The L90 measures the sound level that is *exceeded* 90% of the measurement period, in other words, the quietest cumulative 60 seconds during each 10-minute measurement. The L90 essentially captures the quiet lulls between such things as cars passing by, planes flying over, or wind gusts. The idea is to measure the natural sound level that would be consistently present and available to potentially mask project noise. In addition, the survey sought to measure the L90 background sound level as a function of wind speed because the turbines only generate noise when the wind is blowing.

In addition, CRA was retained by the Town of Allegany to conduct an Ambient Sound Level Assessment to evaluate the accuracy of both the Hessler and James ambient sound conditions in the area of the proposed Allegany Wind Power Project (see FEIS Appendix K). Also, in comparing three sound level measurement methods (L10, L90 and Leq), Based on this study, it is CRA's opinion that the L90 statistic provides a reasonable metric for establishing pre-turbine minimum ambient sound levels for the Project.

Mr. James asserts that the very brief field measurement survey he carried out in April of 2010 on behalf of the opposition group Concerned Citizens of Cattaraugus County (CCCC), where one 2-hour spot sample taken at four locations during calm nighttime conditions, better characterizes the environmental sound levels within the project area than the Hessler survey, where over 2,000 measurements were made at each of six positions over 15 days. This assertion has no basis, and this cherry picking of preferred levels does not provide viable evidence.

Moreover, the James methodology would base the potential noise impact from the project on the background level that only occurs during calm conditions when the project is either completely idle or the rotors are only just starting to slowly turn without generating any significant noise. This is not an appropriate comparison, since the project, by definition, requires windy conditions to operate. The stated justification for this approach is that there are times when the wind and thermal gradients are such that it is sufficiently windy at hub height for the project to operate, but nearly calm and therefore quiet at ground level. While this does occasionally occur at most sites, it is more of an extreme case than a commonplace situation, (and suggested without evidence supporting its frequency of concurrence). In any case, this eventuality has already been taken into account in the analysis where the wind speed normalized from the rotor swept area (180 feet above the ridge crest) has been compared to the same-time background sound levels at ground level. If the stable atmospheric conditions, hypothesized by Mr. James had occurred during the survey they would have manifested themselves as very low sound levels during windy conditions. These circumstances were not present in the Hessler analysis and James produced no study or data to address the very conditions he asserts will exist. Please see Hessler's November 9, 2010 letter report (Reference: L-110510-A) in FEIS Appendix K for additional detail. At best James relies on reference to an irrelevant study conducted in Europe for an area of flat topography, near the ocean. As such, the European study does not carry much weight in the face of Hessler's in depth analysis of actual on site wind and sound conditions for the Everpower Project which will be located, well inland on very hilly terrain in western New York. (See also written response to 1FF above)

With respect to **Written Comment 4B**, contrary to the commenter's assertion, the Planning Board did not designate these sites as "sensitive receptor locations at which the ordinance's limit of 3 decibels (A-weighted, or dBA) above background must be met." The designations were for study purposes only in regard to assessing the project noise levels at those locations. This was an intentional and carefully defined determination of the Planning Board. See Appendix K of this FEIS for the CRA Noise Impact Modeling results.

The following comments are general comments regarding the Noise Section (3.10) of the DEIS.

Written Comment 3F:

We look forward to commenting on Everpower's DEIS when the Board accepts it as complete. At that time we expect to perform a full review of Everpower's noise assessment for the Board's information.

Written Comment 14D:

Members of the board, please be very careful and thorough during your examination of this issue.

Oral Comment 30B:

Second point I wanted to make is that perception of sound is relative to the expectation of the listener. For example, you may turn on your radio at 40 decibels and you can listen to either Mozart or Metallica. One of them you might enjoy, the other one might make you vomit.

Response to Written Comments 3F, 14D, and 30B:

Comments noted.

The following comments identify concerns regarding low frequency noise.

Written Comment 4C:

On February 20, 2009, and again on February 23, 2010, I submitted comments on the modulating (or pulsating) character of wind turbine noise, and the low frequency component of wind turbine noise, two characteristics that can be expected to make such noise more annoying to some people than other industrial noises measured at the same sound level. However, Everpower has never responded to those comments, and the DEIS does not address these problems. The Planning and Town boards should ask Everpower to address these earlier comments.

Written Comment 4D:

The Allegany zoning ordinance *requires* the DEIS to include an assessment of pulsating and low [sic] frequency wind farm noise. A review of everything that was published in 2009 on wind turbine noise, by the Acoustic Ecology Institute in New Mexico, is being submitted to you separately by CCCC member Al Henderson. The AEI review is written in down-to-earth language and criticizes exaggerated claims by both wind project

opponents and the wind industry. However, on these important questions of whether “wind masking” can be expected to mitigate turbine noise, and the modulating and low frequency characteristic of the noise, the AEI review clearly rejects the industry view. The failure to acknowledge and discuss these questions in the DEIS is the primary reason why the noise assessment in the DEIS lacks credibility, and is insufficient to demonstrate the ability to comply with Allegany’s zoning ordinance.

Written Comment 4TT:

The acoustic environment is another obvious resource that would be lost, for those who live within about one mile of the project, depending on meteorological conditions and intervening topography that may block nuisance sounds. Low frequency “thumping” sounds and modulating “pulsing” sounds characteristic of wind turbine noise intrude through broadband ambient sound levels, even when the ambient sound level is high. Most importantly, however, when the expectation of quiet is greatest, at night, wind turbine noise can be expected to be the most annoying, awakening residents who will be at risk of serious health effects if they suffer chronic sleeplessness.

Written Comment 14C:

The developers of this type of project will present the project in the best possible terms. The planning board and the town board are our community’s defense against the negative aspects. For example, if the noise levels are not intrusive then it should be necessary to raise the allowable increases by more than 3% of the current level. This level should apply to any affected residence regardless of distance. I am particularly worried about the low frequency sound. Low frequency sound travels a very long distance and can be exceptionally annoying. Special attention needs to be paid to this type of noise.

Oral Comment 30C:

The third point I wanted to make has to do with low frequency sound. In addition to working as an unlicensed engineer, I am also an amateur musician and a hack. I play bass guitar and everyone who has listened to a Polka band knows that low frequency sound effects your body as much as it does your ears.

Response to Written Comments 4C, 4D, 4TT, 14C and Oral Comment 30C:

Discussions of low frequency noise and pulsating/thumping noises are provided in DEIS Sections 3.7.2.2 and 3.10.1.8, as well as DEIS Appendix O. Specific to the February 20,

2009 and February 23, 2010 comments referenced in Written Comment 4C, please see Hessler's November 9, 2010 letter report (Reference: L-110510-A in Appendix K of this FEIS), which addresses these comments (i.e., comments prepared by Mr. Rick James). See also Response to Written Comments 3E, 4B and 4F.

The following comments are concerns regarding the Town of Allegany's Zoning Ordinance.

Written Comment 13C:

Noise Issues – the applicant was well aware of the Town's Zoning Ordinance when the application was made I find it curious that on page 148 of the DEIS, there are comments addressed to the Board, "The Applicant notes that the Town Board may be considering revisions to this section. In the Applicant's view of the 3dbA standard should be considered for revision as it is unnecessarily restrictive and not reasonably related to health, safety or environmental concerns." They need to explain how the 3dbA standard is not reasonably related to health, safety or environmental concerns, not just make this statement. Also, whatever gave them the thought that revisions were being considered?

Written Comment 13D:

Also found within this section "the Applicant respectfully recommends that it should adopt a 6dbA threshold, which is consistent with the most protective standard identified in the DEC guidance." This certainly indicates to me that that applicant is already acknowledging that they are going to have difficulty meeting a standard that is already in place. Can the applicant meet the standards as they currently exist?

Written Comment 23F:

Why propose to change the town's noise law to accommodate the wind company's standards? Our current planning board has made this proposal upon the advice of their attorney to make the noise standards – enforceable!

Written Comment 37B:

Our second question is related to the sound issue. We would like to know what protection the town is assuring our residents to the noise issue?

CRA is recommending you consider changing your noise ordinance to allow even greater, but to benefit whom? Certainly this would not protect your residents (see below).

According to CRA 2-12-10 Zoning and Sound, page 1

Section 3.7 – Sound

1. Section 3.7.2.2 explicitly states that the project is not in compliance with the zoning ordinance, and yet no mitigation to ensure the project operates in compliance is provided. It is noted that Everpower states that they are in compliance with NYSDEC guidelines, however, the project remains out of compliance with the actual ordinance. Everpower states possible mitigation options as: waivers/easements, relocation, and elimination. Alternatively the applicant may apply for a variance. A project permit will not be issued until compliance with the zoning ordinance is obtained inclusive of any waivers/variances.
2. As demonstrated in the World Health Organization Guidelines (copies of which we previously provided), the sound level would not only exceeds our current zoning ordinance, but exceeds the W.H.O. which indicate which found that any nighttime noise about 30 dBA will have an impact on the ability to sleep undisturbed, and that proven adverse health effects from sleep disturbance results from noise at 40 dBA or greater. Also, as part of CRAs recommendation in CRA 3-8-10 Local Law Recomm., page 1, they use the Ontario Noise Guidelines as part of their argument:

Ontario has a Noise Guideline for Wind Turbine that specifies sound level limits in rural areas ranging from 40 dB at wind speeds of 4 to 6 meters per second (m/s), to 51 dB at a wind speed of 10 m/s.

Written Comment 40A:

One of the biggest impacts for us will be the noise. We were grateful to hear a stringent law limiting project noise to 3 dBA above ambient had been passed. Consequently, when we learned the Planning Board's CRA driven recommendations were for this to be changed, we were most alarmed. Why would consider relaxing the protections in the local law to allow an overall 40 sound level? We thought the current local law reflects the Town board's considered judgment not to degrade the existing acoustic environment.

Written Comment 40B:

On behalf of our family, we are requesting that you keep the current law with respect to this. We are also requesting that no limits be put on the distance that sound could carry,

per the petition issued by Gary Abraham, thus, reassuring us that the sound level is good for one, will be good for others.

Written Comment 54G:

In Memo-017, in regards to Section 3.7 - Sound, CRA requested discussion of waivers and easements despite minor non-compliance. The applicant added the statement that if further mitigation does not appear to be practical to avoid minor intrusions, the applicant will seek to negotiate easements or obtain a variance. A permit can not be issued until the project is in full compliance with the Code. This statement is inadequate and additional discussion is required to address compliance with the Zoning Ordinance.

Written Comment 54R:

Revisions to Plot 1 of the Hessler Report (Appendix N)

- Revise Plot 1 to show the tax map parcels of all properties in the project site, from the revised Figure 2.
- Properties that are not part of the project site (as defined above), but which are participating properties because they have entered into noise or other easements with Allegany Wind LLC, shall be shown on Plot 1, in a manner that distinguishes them from the project site.
- Add a table of worst case sound levels at project site boundaries by tax map parcel
- Due to large area covered by the project, and the relatively small parcels that may not be participating properties, this map shall be provided at a size larger than 8½ x 11”.

Written Comment 54V:

Provide an analysis of compliance with the noise standards in the Zoning Ordinance. State how the lack of compliance with zoning ordinance standards will be addressed.

Written Comment 54W:

It appears that the regulatory noise limit will be exceeded at some parcels. Analyze and discuss this occurrence.

Written Comment 54X:

Discuss the mitigation measures that will be implemented if the post-construction noise assessment results in compliance issues. DEIS p. 200 states that this will be addressed through the Community Outreach and Communication Plan. However, it appears from the mission statement in Appendix G that the Community Outreach and Communication

Plan is intended to be in place during construction and post-construction noise compliance issues. Specific mitigation measures should be proposed.

Response to Written Comments 13C, 13D, 23F, 37B, 40A, 40B, 54G, 54R, 54V, 54W, 54X:

As to comments on possible changes in the Zoning Ordinance, the Planning Board implements the law as adopted by the Town Board. However, as discussed at the March 21, 2011 meeting, the Planning Board has the right to impose stricter requirements as a condition of the SEQRA Findings, which would be in addition to the requirements already set forth in the Town Law. As such, the Planning Board passed a motion as follows: *Mr. Phillips made a motion to use a maximum project sound level of 40 dBA as a mitigation measure for all areas of the Town outside the 2500 foot distance from turbines, with the FEIS to show the Project's compliance with this potential standard..* FEIS Figure 2 (Noise Compliance) depicts the Project turbines and computer-modeled noise contours in relation to participating/non-participating parcels and associated residences. As indicated on this figure, there are currently 10 non-participating residential structures (depicted in red) that would not meet the potential 40 dBA threshold. These structures are located inside the blue 40dBA contour line) and: are identified as follows:

- Two structures on a single parcel on Nichols Run Road owned by Kathleen Burton (Parcel ID 110.002-3-5)
- Two structures on a single parcel on Four Mile Road owned by David Elliott (Parcel ID 111.002-1-4)
- Two structures on a single parcel on Four Mile Road owned by Edward Lemon (Parcel ID 111.002-1-6)
- One structure on a single parcel on Four Mile Road owned by Edward Lemon (Parcel ID 111.002-1-34)
- Two structures on a single parcel on Four Mile Road owned by Edward Lemon (Parcel ID 111.002-1-7)
- One structure a single parcel on Richards Run Road owned by Jay Eckel (Parcel ID 102.001-1-24)

The Applicant is working with these parcel owners in order to obtain an easement/waiver.

The Project Complies with the Noise Standards set forth in the Town Law at Section 5.25(C)(2)(a) with some minor exceptions identified below. It is anticipated from computer modeling, such as that performed by CRA on behalf of the Town in April of 2010 (and which does not differ in any significant way from the applicant's own modeling), that the long-term, average project sound level will slightly exceed the 45dBA threshold established in Section 5.25(C)(2)(a)(i) at a total of seven boundary lines of abutting non-participating properties. These exceedances are shown on FEIS Figure 2. These exceedances affect properties located within the green 45dBA contour line on the following non-participating properties:: :

- Parcel ID 102.001-1-8.1 owned by Greg Benjamin
- Parcel ID 102.001-1-27 owned by John Stayer
- Parcel ID 102.001-1-25 owned by Roger Houston
- Parcel ID 102.001-1-24 owned by Jay Eckel
- Parcel ID 102.004-2-25 owned by Thomas DaPolito
- Parcel ID 110.002-3-4 owned by Margaret Griffin
- Parcel ID 102.001-1-3 owned by James Severtson

In these cases Project sound could exceed this threshold by 1 to 3 dBA in parts of the adjacent properties near their boundaries with participating land parcels. This sound level range of 45 to 48 dBA is characterized in the DEC Guidance as "very quiet" to "quiet", and based on computer modeling, will occur in remote forested parts of the properties far from any dwellings. In fact, as depicted on FEIS Figure 2, one of these parcels is land locked, five of these parcels do not contain residential structures, and only one parcel contains a residential structure modeled to exceed 40dBA. As such, these potential exceedances are essentially more a matter of technical compliance than of actual environmental impact. To address this compliance issue the Applicant has advised that it will follow the easement/waiver approach set forth in Section 5.25(3), or obtain a variance. The Project is in compliance with the 3dBA standard set for in Section 5.25(C)(2)(a)(ii). No turbine is located within 2,500 feet of any sensitive receptors and the Planning Board has not identified any other receptors under this section.

The 45 dBA and 40 dBA compliance issues outlined above are the result of conservative noise modeling techniques (see Response to Written Comments 16F and 38B), which likely overestimate the actual average noise output that will be experienced during Project operation. Based on the conservative computer modeling presented in the DEIS and this FEIS, the compliance issues outlined above are due to the location of numerous

Project turbines (1E, 2E, 3E, 4E, 5E, 6E,, 13E, 14E, 18E, 1W, 8W, 11W). Removing all these turbines would significantly reduce the benefits associated with this Project, such as socioeconomic/financial benefits to the participating landowners and taxing jurisdictions, adding to the diversity of the energy generation mix in New York State, playing a role in the reduction of greenhouse gas emissions, etc. (please see Section 4.1.1 [Project Purpose, Need and Benefit] of this FEIS for additional detail). The Project was originally proposed to include 32 turbines (see DEIS Figure 10); however, the Applicant voluntarily removed three turbines specifically to decrease potential annoyance and/or impacts to residents located in the Chipmonk Valley. Therefore, the benefits originally anticipated to be associated with a 32 turbine project have been proportionately reduced to the currently proposed 29 turbine Project. Given the fact that actual impacts associated with operational noise are extremely minimal (i.e., although compliance issues are outlined above, adverse impacts are not anticipated as discussed in Response to Written Comment 39B below), further reduction of the number of turbines are not warranted in light of the Lead Agency's responsibility under SEQRA to weigh the benefits and impacts associated with a proposed action.

It should also be noted that at the April 11, 2011 Planning Board meeting, the Board inquired as to the Applicant's ability to relocate and/or remove turbines 8W and 18E. Regarding relocation, the Applicant can only place turbines on lands under easement, and within these lands there are many factors that limit (and in many instances eliminate) the Applicant's ability to adjust turbine locations, such as steep topography, rock formations, existing oil/gas wells, and a wake loss (e.g., to maximize energy generation, downwind turbines must be separated by approximately 2,000 feet).

The assertion is raised in the comments that a Project level greater than 30 dBA will result in sleep disturbance per the latest WHO *Night Noise Guidelines for Europe*; however, the guidelines state that "there is no sufficient evidence that the biological effects observed at the level below 40 dB $L_{\text{night, outside}}$ are harmful to health" and recommend a maximum outdoor sound level of 40 dBA as a design goal. With respect to sound levels between 30 and 40 dBA the guidelines conclude that "even in the worst cases the effects seem modest. $L_{\text{night, outside}}$ of 40 dB is equivalent to the lowest observed adverse effect level (LOAEL) for night noise." It is anticipated that nearly all residences surrounding the Project will not experience long-term sound levels exceeding 40 dBA due to the Project. Specifically, of the 10 structures listed above, seven are located between the 40 and 41 dBA contours, and three are located between the 41 and 42 dBA contour line. As noted above these sound levels are identified as "very quiet to quiet" in the DEC

Noise Guidance Thus, the Project is expected to essentially meet WHO recommendations.

As to guidelines from other areas (e.g., Ontario), the Lead Agency is aware that other communities establish other standards, and the thresholds in these standards vary. The Town of Allegany has established a restrictive and protective noise threshold consistent with New York State guidelines.

The following comments are in regards to potential noise related impacts as a result of the Project.

Written Comment 16F:

During my visits to wind array installations, I've heard loud mechanical noises from several turbines that were apparently in need of repair. The noise was noticeable from considerable distance and non-stop. Clicking and clacking of the mechanism was observed. Also, I noticed a whooshing sound coming from the blades as they turned. This sound became more noticeable as I wore – and less noticeable when I removed – the earplugs I wear while motorcycling to protect my ears from damage. This suggests to me that at some times, noise from the wind turbines will likely intrude homes' quiet interior even when less noticeable outside. This is contrary to what I expected.

Written Comment 38B:

My biggest concern is how this project will affect my immediate family residing in this project area, which includes three households and five grandchildren.

I have sought out the reactions of those living near the industrial wind farms because experts aside, I wanted to hear from those ordinary everyday citizens and find out whether they've been affected by the turbines. Over and over and over again, the same responses are relayed.

Audible sounds from wind turbines have been described ranging from nuisance to intolerable levels. Researchers found the odds of being annoyed by wind turbine noise increased with increasing sound pressure levels, rural areas and hilly or rocky terrains, which aptly describes our project area.

Response to Written Comments 16F and 38B:

Potential noise-related impacts are discussed in Section 3.7.2 of the DEIS, which includes the following:

According to Rogers et al. (2006), the sources of sounds emitted from operating wind turbines can be divided into two categories: 1) mechanical sounds, from the interaction of turbine components, and 2) aerodynamic sounds, produced by the flow of air over the blades. Mechanical sounds originate from the relative motion of mechanical components and the dynamic response among them. Since the emitted sound is associated with the rotation of mechanical and electrical equipment, it tends to be tonal (of a common frequency), although it may have a broadband component. Aerodynamic broadband sound is typically the largest component of wind turbine acoustic emissions, and is generally characterized as a “swishing” or “whooshing” sound. It originates from the flow of air around the blades, and generally increases with rotor speed.

In order to quantitatively look at potential impacts in absolute terms, a modeling study of worst-case Project sound levels was carried out to determine what specific sound levels could be expected at the nearest receptors. Using the design sound power level spectrum for the Nordex turbine, worst-case Project sound levels were calculated using the Cadna/A®, ver. 3.7 noise modeling program developed by DataKustik, GmbH (Munich)... The model represents a theoretical worst-case condition at any given receptor point that would require a convergence of the following conditions to occur:

- **Wind Direction** – The model assumes a hypothetical situation where wind is blowing from all directions at the same time.
- **Critical Wind Speed** - A 7 m/s wind represents the point where the least amount of masking noise is likely to be present relative to the turbine sound level.
- **Wintertime Background Levels** – The background survey was conducted under wintertime conditions when ambient levels are normally at an annual minimum (without leaves rustling or summer insects/birds)
- **Conservative L90 Background Level** – The critical design wind condition of 7 m/s is based on the L90 background sound level that represents the near-minimum sound level. By definition, a higher background sound level will actually exist most of the time (90% of the time).
- **Low Ground Porosity** – Wooded areas and fields are normally more acoustically absorptive than assumed in the model.
- **Observer Outside** – The plotted sound levels occur outside; sound levels inside of any dwelling will be 10 to 20 dBA lower.

As indicated in the DEIS, sound levels are expected to be 10 to 20 dBA lower inside a dwelling with windows shut.

In regards to the “whooshing” sound, see Response to Written Comments 1DD and 4E in this Section. In regards to the noises heard at other wind power projects, it is beyond the scope of this document to address noise levels heard at other facilities. However, the Community Relations Plan provided in Appendix G of the DEIS outlines a procedure by which noise complaints relating to this Project are addressed. Additional requirements for the Complaint Resolution will be part of any permit (if one is issued). Municipal power to enforce noise ordinances has been upheld in multiple scenarios, including the ability to obtain injunctive relief against offenders. In addition, the Town's Zoning Ordinance contains enforcement provisions.

In regards to sound levels resulting from the proposed Project, atmospheric stability can enhance the generation and propagation of wind turbine noise; however, there is no way this effect can be quantitatively calculated or modeled. Because it is impractical to deal with numerically, the assessment provided in DEIS Appendix N discusses the issue of temporarily higher project levels verbally and describes the nature of wind turbine noise in an effort to convey an idea of what might be expected. No claim is made that no annoyance will result from these short-term noise peaks; however, amplitude modulation (often due to wind shear during stable atmospheric conditions) and other temporary phenomena related to atmospheric conditions are largely universal at all similar wind projects. Field tests of completed projects in New York and elsewhere indicate that complaints are few at the sound levels predicted for the Allegany project at the nearest homes. In other words, in situations where the intermittently adverse character of wind turbine noise is combined with a relatively high mean predicted sound levels of about 45 dBA or more complaints can be expected, but when the mean sound level is lower, particularly when it is lower than 40 dBA, adverse reaction is usually minimal. Average sound levels of 40 dBA, or in the vast majority of cases, much less than 40 dBA, are predicted at the residences adjacent to the Allegany project.

Written Comment 20A:

A copy of *Evaluation of Supplemental Environmental Noise Analysis for “Cohocton Wind Power Project”* was provided by an unidentified commenter, without a cover letter or transmittal.

Response to Written Comment 20A:

The study submitted by the commenter was not included in the DEIS for the Allegany Wind Power Project. The DEIS subject to this SEQRA review analyzes the potential impacts associated with the proposed Allegany Wind Power Project, which proposes use of different wind turbines than those used in Cohocton (please see Hessler's November 9, 2010 letter in FEIS Appendix K).

Written Comment 23A:

Everpower is considering placing 29 turbines on adjacent ridges...where the topography cups and funnels sound through our valley. I can hear my neighbors' normal voice conversations three homes away and have often been told to shush by my husband because I had been speaking too loud. This is not the topography to place these turbines. The background sound level if the town actually had an independent acoustical firm do an actual modeled study at our designated sensitive receptor sites would surely demonstrate the difficulty in buffering sound in such a pristine environment!

Response to Written Comment 23A:

On behalf of the Town of Allegany, an independent Ambient Sound Level Assessment was prepared by CRA (dated September 27, 2010). With respect to the background sound level in the Chipmonk valley, the overall average background level at CRA's valley location (identified as L2 in the September 27, 2010 report) is reported as 35 dBA, supports the background sound level identified in the *Environmental Sound Survey and Noise Impact Assessment* (Appendix N of the DEIS).

Written Comment 39B:

My wife and I have already submitted a letter to both boards in regards to the CRA driven recommendations to relax the protection in local law to allow an overall 40 dBA sound level. This evening I am submitting a copy of the complete 2009 study (over 150 pages) from the World Health Organization which found that any nighttime noise about 30 dBA will have an impact on the ability to sleep undisturbed, and that proven adverse health effects from sleep disturbance results from noise at 40 dBA or greater. With this is a copy of the e-mail correspondence my wife had with Dr. Rokho Kim, director of the WHO European Center for Environment and Health which released this study. I'm asking you again to keep the current noise standards unchanged.

Response to Written Comment 39B:

Changes in the law have not been made, nor are they part of this SEQRA review. The numbers referred to in the WHO report are inside the bedroom. A sound level of 40 dBA or less outside of residences is the night noise guideline (NNG) recommended in the 2009 WHO study to prevent significant sleep disturbance. Outdoor sound levels lower than 40 dBA have been observed in some cases to produce several apparently minor effects but, to quote the study, “even in the worst cases the effects seem modest”; hence, the guideline target of 40 dBA. Mean project sound levels of less than 40 dBA are expected at nearly every residence in the vicinity of the project. However, according to the evaluation provided in DEIS Appendix N, there are approximately 8 non-participating residences (subsequently determined to be 10 non-participating residences due to multiple structures on single parcels, as discussed in this FEIS) modeled to experience slightly more than 40 dBA (in no case higher than 42 dBA). Although the DEC Guidance from an environmental impact standpoint recognizes that these levels are very quiet, the Applicant has indicated they will attempt to obtain easements with these non-participants.

The following comments are in regards to sound levels at nearby residences.**Written Comment 46A:**

I would like to know in detail how you are going to mitigate a sound level that is only 3 db's above our sound level that we have now? We will have turbines on both sides of our house.

Oral Comment 23C:

Then I started reading about the complaints all over the world on the noise. Wind turbines are very noisy and some places they are much more noisy than others. We have a topography here that when these wind turbines are on the ridges, the sound is going to carry down into the valleys. They feel that it would be much louder there than in a normal flat area like some of the rolling high-type places. So the town folks I think at one time kind of dismissed the noise thing, but I think they know that there is a noise problem today with the wind turbines.

In fact, they would like to – the town planning board is recommending raising the noise level to the town board. And the only reason I could see why they'd do that, they may be afraid that the turbines won't meet the noise level that we have right now.

I believe the burden from the noise of these turbines for the residents of Chipmonk, Knapp Creek, West Branch, Four Mile, Lippert Hollow far outweigh the benefits.

Response to Written Comments 46A and Oral Comment 23C:

Complaints from around the world do not provide a basis to review this Project. As stated in the *Environmental Sound Survey and Noise Impact Assessment* (Appendix N of the DEIS), an assessment of project sound levels carried out in accordance with NYSDEC guidelines indicates that the threshold for a potential noise impact is associated with a project-only sound level of 40 dBA for receptors in the sheltered valley settings (e.g., the valley portion of Chipmonk Road) and 42 dBA in exposed elevated areas. As depicted on Plot 1 (DEIS Appendix N), no receptors in the valley settings are modeled to experience sound levels in excess of 40 dBA. See Response to Written Comments 13C, 13D, 23F, 37B, 40A, 40B, 54G, 54R, 54V, 54W, 54X for discussion of compliance in regards to noise and the Zoning Ordinance.

Written Comment 53A:

The Town of Allegany Planning Board must protect families from the harmful effects of low-frequency noise, audible noise, vibration, stray voltage, and shadow flicker.

Currently many jurisdictions across the world such as in France, Germany, Denmark, The Netherlands, and Australia limit industrial noise pollution from wind turbine complexes to 40 dBA or less. There are calls to further reduce these limits.

The National Institutes of Health (NIH) has stated in an editorial 'Wind energy will undoubtedly increase noise, which increases stress, which in turn increased the risk of cardiovascular disease and cancer.' *Environmental Health Perspectives*, volume 116, pg A237-238, 2008).

In Japan, in February 2009, 70 cases of adverse health effects with wind turbines were reported. The Japanese call this Wind Turbine Disease. The Japanese Minister of Environment fears a public health issue and is investigating low frequency sound as being of concern.

Response to Written Comment 53A:

There is no evidence suggesting the standards established in the Town of Allegany are harmful to human health nor do the unexplained anecdotal claims in the comments provide useable evidence. Numerous measurements by numerous investigators have shown that there is no significant low frequency noise associated with wind turbines (Leventhall, 2005;

Sondergaard and Hoffmeyer, 2007; Colby *et al.*, 2009; Hessler, 2009). Typical turbine sound levels below about 100 Hz are substantially lower than those experienced by millions everyday when driving in a car. There are clearly no adverse health effects associated with this activity just as there are no adverse health effects associated specifically with low frequency noise from wind turbines. The misconception that turbines produce high, even harmful levels of low frequency evidently stems from a common but little-known measurement error where any casual measurement in a windy field shows ostensibly high levels of low frequency noise – whether a turbine is present or not. Wind blowing over the microphone tip, even with an extra large windscreen, creates this false signal noise.

Annoyance, stress and potential health effects, if they occur, most likely stem from simply being able to hear the turbines when one doesn't want to or was expecting not to. There is nothing in the sound itself that is dangerous or unusual. See FEIS Section 4.11 Response to Written Comments 7B, 9B, 18A, 23D, 35A,39A, 39C, 41A, 46B, 46E and Oral Comments 5C, 6A, 10A, 22A for further discussion on health impacts.

Written Comment 54H:

The required post-construction noise evaluation and its methodology is not discussed in the DEIS. The applicant must provide these details.

Response to Written Comment 54H:

The Applicant is aware of the required post-construction noise evaluation, which is set forth in Section 5.25(C)(2)(d) of the Town of Allegany Wind Energy Regulations (adopted August 28, 2007), and specifically states:

Within one year of commencement of commercial operation, the project proponent shall submit a noise study of operation conditions to ensure that the project is in compliance with the standards of this section. The study shall be based on receptor points identified during the application review process. In addition to the initial study, the Planning Board may require periodic additional noise studies.

The Project Sponsor will be required to fully comply with Section 5.25 as a condition of any approval.

Written Comment 54Q:

The Zoning Ordinance, Section 5.25(C)(2)(a)(ii), sets a standard in terms of both daytime and nighttime sound levels. Report both the **daytime and nighttime background sound levels** that were measured.

Response to Written Comment 54Q:

The survey consisted of thousands of 10-minute measurements taken continuously day and night at 6 locations for about 15 days. All the recorded data is reported in the study. Normally, separate daytime and nighttime regression analysis is conducted if the sound level versus time data suggests, even vaguely, that there is a cyclical and repetitive diurnal dependence (i.e., it generally gets quieter at night). This kind of a pattern is usually obvious or non-existent, which was the case here and is often the case with wind power in general. After excluding the unrepresentative noise from water run-off in the mountain ravines or valleys, the sound levels were found to be essentially a function of wind speed (i.e., dependence on wind speed) (as observed by a met mast on the ridge) and there was no dependence whatsoever on time of day.

More specifically, Hessler ran the numbers for the nighttime-only and daytime-only levels for the valley receptors. At the key wind speed of 7 m/s when the turbine first reaches its maximum sound power level, the nighttime and daytime levels vary from the overall day/night mean by -0.4 and +0.3 dBA, respectively. These differences are intangible changes in sound level indicating that there is clearly no repeating dip in sound levels at night. Consequently, the daytime and nighttime levels, if analyzed individually rather than all together, would not have been substantially different.

Written Comment 54S:

The Zoning Ordinance requires manufacture's noise design and field testing data, both audible dBA and low frequency. This is not provided in the Nordex brochure in Appendix T. Provide this data, including 1/3 octave band data and/or provide a comment/guarantee that the Nordex units are not tonal.

Response to Written Comment 54S:

The manufacturer has not yet released detailed frequency spectrum information for the Nordex N100. However, there is no reason whatsoever to believe that this turbine model will generate any kind of tonal noise. Wind turbines generally do not emit significant tones and are only rarely found to exhibit weak tones at the standard IEC test distance of about 400

feet, which rapidly fade away with increasing distance (to the point where they are essentially insignificant at typical set back distances).

Written Comment 54T:

Expand the discussion of potential noise impacts from **turbulence**. DEIS p. 146 states “turbines can commonly be discerned at fairly large distances even though the actual sound level may be relatively low and/or comparable to the magnitude of the background level.” Discuss what is meant by “fairly large distances.” Describe “actual sound level.”

Response to Written Comment 54T:

‘Fairly large distances’ means roughly 2000 to 3000 feet. At such distances, under unusual circumstances, such as a storm front passing through or highly unstable wind conditions, the turbines might be more audible than they otherwise would be but the actual sound level, if one were to measure it, would be relatively low, say in the vicinity of 30 to 35 dBA. What would make it unusually audible would be the periodic swishing sound (amplitude modulation) that can be enhanced under such conditions or when the wind shear gradient is relatively high. Without this identifiable characteristic wind turbine noise, in general, would not be particularly noticeable beyond about 2000 feet. irrespective of turbulence or atmospheric conditions.

Written Comment 54U:

Discuss the effect on anticipated sound levels from atmospheric conditions such as humidity and atmospheric stability. Comment on the wind plus atmospheric effect on noise impact modeling.

Response to Written Comment 54U:

Humidity has no significant role in wind turbine noise or its propagation. Atmospheric stability on the other hand, can enhance the generation and propagation of wind turbine noise; however, there is no way this effect can quantitatively be calculated or modeled. Because it is impractical to deal with numerically the Appendix N assessment discusses the issue of temporarily higher project levels verbally and describes the nature of wind turbine noise in an effort to convey an idea of what might be expected. No claim is made that no annoyance will result from these short-term noise peaks; however, amplitude modulation (often due to wind shear during stable atmospheric conditions) and other temporary phenomena related to atmospheric conditions are largely universal at all similar wind projects. Field tests of completed projects in New York and elsewhere indicate that

complaints are few at the sound levels predicted for the Allegany project at the nearest homes.

Written Comment 54Y:

CONSTRUCTION NOISE

- DEIS, Section 3.7.2.1 (p. 142) contains a discussion of construction noise, and Table 18 provides Construction Equipment Sound Levels. However, DEIS p. 41, states that equipment other than that listed in Table 18 will be used to break up bedrock. Discuss whether this equipment is similar to that shown on Table 18, and, if not, revise Table 18 to include the backhoe and pneumatic hammer mentioned on p. 41.
- Discuss noise impacts from blasting, and provide mitigation measures.
- Table 18 provides anticipated sound levels in decibels at 50 feet, 1,200 feet and 7,600 feet. Figure 4 indicates that most homes are located at the 2,500 feet. Alternatively, this could be shown as a contour on Plot 1.

Response to Written Comment 54Y:

The use of a hoe ram, or pneumatic hammer, was not anticipated at the time the construction noise analysis was done. This piece of equipment produces a rapidly repetitive impact noise that is usually audible up to several thousand feet away even though the average magnitude of it, measured over say a 1 minute period, is likely to be comparable to the natural background level at those distances. Because it is distinctive and identifiable it is likely to be perceived at the closest residences to where it is being used and may result in some degree of unavoidable but temporary annoyance.

While blasting certainly sounds like a noisy activity it usually isn't. The charge goes off under the surface and the filled drill hole is covered with a heavy blast mat. The noise from such blasts is often difficult to detect on instruments even a couple hundred feet away.

It is not really practical to plot construction noise in the form of sound contours because the noise is not emanating from the entire site at the same time but rather from one or more specific work sites, such as at a turbine foundation or a road construction or trenching operation, the locations of which will vary continuously over the construction period.

Written Comment 54Z:

Hessler report, Appendix N, p. 21 states: "It is a well-established fact-for a new broadband, atonal noise source with a frequency spectrum similar to that of the background-that a cumulative increase in the tonal sound level of about 5 or 6 dBA at a given point of interest is required before the new sound begins to be clearly perceptible or noticeable to most people." Provide citations to support this assertion.

Response to Written Comment 54Z:

The perceptibility of a new sound source once it is about 5 dBA above the background level is the fundamental basis for the 6 dBA increase impact threshold found in the NYSDEC noise assessment guidance (if a new source is 5 dBA above the background the new cumulative total sound level will be 6 dBA higher than it was before). This relationship was probably first expressed in British Standard BS4142:1990 *Method for rating industrial noise affecting mixed residential and industrial areas* where a 5 dBA increase over the L90 background level is considered to be "of marginal significance".

Oral Comment 1B:

When I talked to Kathy, I said – we talked about – we said a lot of people don't know what noise is or when they hear at the meetings 50 dBs or 50 dBA. What the heck is that? So that's what I said I was going to do.

What I was actually going to do is tape record a wind mill and then bring it in and play it back at 50 dB, which I thought would be real simple. Tape recorder doesn't work, blah, blah, blah. Had a lot of problems so I'm going to have to do it verbally.

The old expression if a tree falls in the wood, does it make a sound. Philosophical people say one thing. Practical people say another thing. Yes, it does make a sound.

A sound is when vibration is made and then it is heard when the vibration goes to some mechanism like an ear or a tape recorder and then that vibration is changed into electrical impulses or so on, or brain impulses, and that's what sound is. It can be very quiet. It can be very noisy. It can be high-pitched. It can be low-pitched. Okay. A lot of variations.

A decibel is a measure of noise. Okay. A dBA – or dB, decibel. A dBA is an A scale on a sound level meter. There's a couple of scales, but the one A scale is especially for people. It takes into effect things that people do that other things do like machines and so on.

The A scale is what everybody uses and the ranges of the A scale are from zero to 140, okay, dBA decibels on the A scale.

Zero is where you just start to hear. You can hear the differences of three decibels. You can distinguish the difference. So you can't hear anything at zero, but at three decibels you'd say there's a noise, there's a sound. 140 dBA is threshold of pain. You can't stand that.

Response to Oral Comment 1B:

Comment Noted. Please see DEIS Appendix N and Section 3.7 for a detailed discussion and analysis on noise, in addition to this section of the FEIS.

Oral Comment 4I:

What will the exact procedure be to rectify noise complaints and sleep disruption at affected residences? How will the Town require Everpower to eliminate such problems? Will these requirements have teeth and be in writing and agreed to before construction? At the Planning Board's March 7 meeting during a discussion between Mr. Phillips of the town planning board and David Koebelin concerning sensitive receptor placement at his residence Mr. Phillips stated that Mr. Koebelin was probably going to see 17 or 18 turbines but he probably wouldn't hear them at that distance from his residence. Doesn't this show in effect, that the Town Planning Board is acknowledging noise issues at closer locations? Has any town legally been successful in shutting down and removing turbines that have caused unacceptable noise conditions?

Response to Oral Comment 4I:

The Community Relations Plan provided in Appendix G of the DEIS outlines a procedure by which complaints are addressed. Additional requirements for the Complaint Resolution will be part of any permit (if one is issued). The noise studies conducted obviously show noise levels different at closer properties than further away properties; that is not an acknowledgement of the "noise issues," as assumed by the commenter. Municipal power to enforce noise ordinances has been upheld in multiple scenarios, including the ability to obtain injunctive relief against offenders. In addition, the Town's Zoning Ordinance contains enforcement provisions.

Oral Comment 4M:

We have been told by residents of other communities with wind turbines how promises before hand were never kept and ended by turning into nightmares after. They were abandoned by their town board and told it was out of their hands and that they needed to take any complaints up with the turbine company. Their complaints now get the proverbial run around or go unanswered. This is exactly what I fear will happen here. Cohocton, N.Y. residents affected by wind turbine noise spoke recently here in Allegany at one of our information meetings about the reality and severity of the noise. It is important to note that the same firm (Hessler and Assoc.) did the noise analysis there as they have done in Allegany. No significant noise problems were anticipated by their findings. Other experts took issue with his noise study method used in Cohocton by Hessler back in 2007. It was flawed just as our groups attorney, Gary Abraham has tried to show and warn our town boards about. Considering the facts, shouldn't this immediately raise a red flag?

Response to Oral Comment 4M:

The largely understandable noise problems at Cohocton stemmed from the fact that accurate noise emissions data on the then new turbine model used there was not available at the time the Hessler pre-construction noise study was carried out. Preliminary measurements made on a prototype were provided for the modeling and impact assessment, which, even based on that data, indicated that some adverse noise affects were possible and the assessment did not conclude, as has been implicitly assumed, that noise would not be an issue. The crux of the issue, however, was that the actual sound emissions were substantially higher than indicated by the manufacturer and of an unique, primarily mechanical, nature due to the open design of the nacelle allowing generator and fan noise to escape and due to an intermittent chattering noise from yaw mechanism that was most prevalent during the early commissioning phase of the project. This type of turbine will not be used on the Allegany project.

Oral Comment 7A:

I live in Chipmonk. Earlier this week I awoke, it was nice and relaxed. It was 3:00 in the morning. And what happened was that I could hear cars on a railroad and I could hear the constant movement of the railroad cars and moments later I heard the whistle of a locomotive. And I wanted to share with you that the closest railroad track is two miles from our house. So certainly what came to mind as I was lying in bed was that if this project goes through, and what might happen, is that I'll be lying in bed in the future, maybe too soon,

listening to the sound of the turbines because that's when it's going to be most intense, at night.

And in terms of according to the latest reports, these turbines will be much closer to my house than the two miles that – and over two miles where the railroad is located. And I believe that the problem with sound will be horrific in our area given the topography in the Chipmonk Valley.

Response to Oral Comment 7A:

As indicated in Table 17 (Common Sources of Sound and Associated Typical Sound Levels) of the DEIS, a wind farm at 350 meters has an approximate 35-45 dBA level, which is quieter than a 40 mph car at 100 meters and a busy general office. Specific to the anticipated noise of the Allegany Wind Power Project, significant detail and analysis is provided in Section 3.7 and Appendix N of the DEIS and in this section of the FEIS.

Oral Comment 14B:

Recently we brought some fellow citizens from Cohocton and Sheldon to speak to you. Only three of 14 invited town and planning board members appeared. Their stories of wind company assurances sounded familiar to all the stories I have read about. They spoke about low frequency sound disturbances. They measured over 78 to 95 dBA at night. They reinforced that the sound could be heard five miles out. They spoke about the chronic sleeplessness and the purchase of competing background sound machines to drown out sounds.

Response to Oral Comment 14B:

With respect to Cohocton-related noise problems, please see Response to Oral Comment 4M. The Project must meet requirements in the Zoning Ordinance in regards to noise.

Oral Comment 30A:

I've been a resident of Allegany for 11 years. I work as an engineer in Olean. I just wanted to say I'm against this project. I just had three quick points I wanted to make.

Number one, sound is always relative to the background level of sound. For example, a dripping faucet may be less than 40 decibels, but if you're listening at night, it keeps you awake, you're going to notice it, it's going to affect your life, affect your sleep, your health and your performance of work the next day.

Response to Oral Comment 30A:

The *Sound Survey and Noise Impact Assessment* provided in Appendix N of the DEIS takes into account background sound levels. See also responses to Comments 1BB, 1EE, and 3B and FEIS Appendix K.

Oral Comment 38A:

I'm a resident of Pennsylvania. I live just on the other side of this hill all you people are talking about. We're a forgotten sector of this proposed wind farm. I can throw a snowball from my house to Knapp Creek. I live east of here. We have the prevailing westerlies. I'm going to get all that noise carried my way.

Response to Oral Comment 38A:

The Project is not anticipated to result in any noise impacts to residents in Pennsylvania.