

November 7, 2013

Via email mreilly@masoncounty.net

Mary Reilly
Mason County
304 E. Ludington Avenue
Ludington, Michigan
49431

**Re: Appeal by Consumers Energy Company, Exhibits C and E
Post Construction Sound Survey for the Lake Winds Energy Park
Mason County, Michigan**

Dear Ms. Reilly,

As requested, I have reviewed the materials in Exhibits C and E to Consumers Energy Company's Appeal. It is disappointing to see Consumers and Tech Environmental mount such pointed criticism against the study prepared by HGC Engineering, but under the circumstances it is to be expected. The financial stakes are high for Consumers if the County forces them to significantly curtail their turbines, and Tech Environmental, as the firm who prepared the acoustical assessment upon which Consumers and the County relied, could conceivably be held accountable for the loss.

It is noted that both sides in the dispute complained about bias in our conclusion, which could be taken as a sign that our survey was reasonably fair. Rand Acoustics, acting for a resident, claimed our data "clearly show the Lake Winds Energy Park exceeds regulatory limits when the turbines run above 1/3 power". At the same time, Tech Environmental, acting for Consumers, took exception to our statement that "the wind turbines were in general compliance with sound level criteria" suggesting it wrongfully implied some periods were out of compliance.

HGC Engineering approached the sound survey with no vested interest in the outcome, and in that regard our report did not come down strongly on compliance one way or the other. The wording in the report was intentionally left with a degree of flexibility.

One of the main reasons the wording was left imprecise, aside from not wishing to enflame one side or the other, was that the clause in the ordinance is not clear from an engineering perspective and we were initially unaware of the stringency of the criteria that the County expected to enforce. It was only after the fact that HGC Engineering learned that the County had considered a provision such as "the sound level shall meet X limit, 95% of the time", which would have provided a firm engineering benchmark to work with, but that the County considered that wording too lenient. The County has



ACOUSTICS



NOISE



VIBRATION

now confirmed that there was no intention of averaging sound over a long period or allowing for sound exceedance a small percentage of time.

As the County is expecting that the 45 dBA criteria should not be exceeded by the sound due solely to the turbines in any 10 minute period, then I can assure the County that competent, material and substantive evidence supports the conclusion that the turbines are not in compliance at certain residences on occasion. This conclusion is supported by the temporal variation of sound levels in HGC Engineering's report of August 2, 2013, Rand's analysis of August 14, 2013, HGC Engineering's supplemental statistical analysis of September 12, 2013, and both Tech Environmental's and HGC Engineering's on-off data as presented in letters of October 2, 2013 and October 22, 2013, respectively, once consideration is given to adjusting the sound levels for full electrical power¹.

Excursions over 45 dBA should have been anticipated since, as outlined in the acoustic study by Tech Environmental prepared in June 2011, the wind energy park was designed with sound levels identically equal to the 45 dBA criteria at some key receptors with no factor of safety to address the fact that the prediction methodology has a stated accuracy worse than +/- 3 dBA. If Tech Environmental was aware that achieving the criteria even 95% of the time was unacceptable to the County, it would have been prudent to incorporate a suitable safety margin to account for the statistical variation in sound levels.

The main argument put forth by Consumers and Tech Environmental in Exhibits C and E is that the clause in the ordinance "the study should generally follow procedures in the most recent versions of ANSI S12.9 Part 3 (with and without an observer present) and ANSI S12.18" should be strictly interpreted as excluding any long term or unattended measurements. Technically, they have a point; despite the ordinance seeming to anticipate unattended monitoring and requiring the measurement of LA₉₀ levels, Part 3 is specifically valid only for "Short Term Measurements with an Observer Present". It is unfortunate that the ordinance did not also reference ANSI S12.9 Part 2: "Measurement of Long-Term, Wide-Area Sound", as this would have explicitly allowed for the broader assessment of the sound impact².

Following onward from the argument above, Consumers and Tech Environmental argue that there were no valid attended periods during the sound survey that clearly indicated non-compliance. This is essentially correct in that none of the valid attended on-off measurements, either by HGC Engineering or Tech Environmental, demonstrated sound levels solely due to the turbines that exceed the 45 dBA criteria, albeit none of the attended on-off measurements were conducted when the turbines were operating at full electrical or sound power. This puts forth the question of whether not catching LWEP out of compliance is the same as demonstrating compliance. As put forth in HGC Engineering's submission of September 12, 2013, additional attended on-off measurements with the turbines at full production would help settle this from a technical perspective and would also provide a numerical target for any mitigation that is required.

We trust the above is of assistance to Mason County and the Planning Commission. I have made arrangements to be available the evening of December 4, 2013, by telephone, to respond to any questions arising before the Mason County Board of Appeals. In the meantime, if you have any questions or require further information, please call.



ACOUSTICS

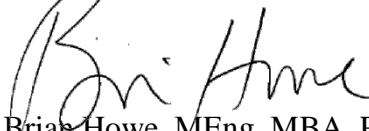


NOISE



VIBRATION

Yours truly,
Howe Gastmeier Chapnik Limited


Brian Howe, MEng, MBA, PEng

¹ HGC Engineering has specifically avoided citing electrical power production given the confidentiality agreement with Consumers that allowed such data to be presented only in graphical form. We no longer have access to any production data.

² Several major jurisdictions, New Zealand, the UK, and Canada specify audit procedures for wind turbine noise that rely on long term monitored LA_{eq} and LA_{90} levels.



ACOUSTICS



NOISE



VIBRATION