

## Sound expert shares turbine information, advice with Lake Township

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James - an acoustics expert with more than 35 years of experience in community noise, and former member of the American National Standards (ANSI) Noise S12 that oversees ANSI Standards for Community Noise - said he was asked to discuss what could be quite an extensive development by DTE Energy on the northwest corner of Huron County.

He said the area is a fairly dense location for planning future developments of wind turbines and asked DTE Energy representatives at the meeting if they could identify specific locations where the company would like to place turbines.

DTE Renewable Energy Development Manager Grady Nance said the map James was looking at showed the dense area was a map of where easements have been acquired - not where actual turbines will be erected. The location of turbines has not been decided as the company's still conducting wildlife studies and gathering wind data, he said.

DTE Energy will continue to do those studies and research over the next year and a half before any final decisions are made, Nance said. He stressed DTE Energy is here for the long term.

Township officials asked James to come to a meeting and share some of his expertise because they currently are conducting research for a wind overlay ordinance.

Lake Township instituted a one-year moratorium on any wind farm developments during the township board's March meeting, said Lake Township Clerk and Planning Commissioner Valerie McCallum.

"As a planning commission, we're trying to come up with an ordinance that will be best for this township," said Lake Township Planning Commissioner Tim Lalley during Wednesday's meeting.

Lalley said this has become an extremely divisive issue in the township.

During the meeting, the commission was given an informal petition signed by 135 residents who said they are in favor of a wind overlay ordinance.

In regards to the petition, planning commissioners at Wednesday's meeting said it's not that the township is opposed to any wind farms or a wind overlay ordinance, they just want to make sure a comprehensive ordinance is in place to avoid problems that could arise following a development's construction.

"You should be thankful ... because if and when this thing will be finished, it will be done correctly," Lalley

said.

Elkton resident Gene Champagne said his house is surrounded by turbines that are part of the John Deere-owned Harvest Wind Farm. He said he's had noise problems and periodic flickering of shadows in his home during certain times of the year. He said he's no stranger to noise, as he's surrounded by farmers and used to the activities that go on during the harvest season, but the noise from the wind turbines is different in that they operate 24/7.

Champagne stressed in no way is he anti-wind. In fact, he said he's a strong supporter of wind developments. Rather, his point was to show how the problems he's experiencing could have been avoided during the planning stages.

He applauded the Lake Township Planning Commission for taking its time in creating a wind overlay ordinance and urged them to continue to do so because, "once they're up, they're up."

Nance said he's been to Champagne's home and has seen first-hand what Champagne described during Wednesday's meeting.

"He really is surrounded by turbines ... he's surrounded so that he's always down wind from a turbine," Nance said, adding the siting of turbines is a very complex thing. "... It's our intention to avoid these sort of issues."

So far, Lake Township hasn't delayed DTE Energy's work, Nance said.

"It's certainly their prerogative to do that (to conduct research and take some time before adopting a wind overlay ordinance), and if that's what makes them feel comfortable, that's what they should do," he said.

During his presentation, James explained while many communities use setbacks as a way to limit a turbine's noise impact, he wouldn't recommend it because property setbacks are designed to protect neighbors from the unlikely event of a turbine failure (i.e. ice thrown from a blade) - not from noise.

Instead, he recommended the township adopt siting guidelines for noise like many European countries have using the L90 standard.

The L90 dictates sound levels must remain below a previously-determined level 90 percent of the time - i.e. if a community adopts a noise standard of 45 dB(A) L90 at the property line, that means sound measured at the property line from any turbines placed in that community must be below 45 dB(A) 90 percent of the time.

To understand what the "45 dB(A)" means, James gave a background of what sound is and how it's measured.

He said sounds are pressure waves, and have different frequencies.

Sound is measured by using units of decibels (dB), and A-weighting which compensates for the sensitivity of human hearing. A-weighted sound levels then are measured by dB(A).

He said though there are no U.S. standards for wind turbines and turbine noise, the state does have some guidelines developed by the Energy Office, Michigan Department of Labor and Economic Growth to assist local governments to develop siting requirements for wind energy systems.

James said the state's guidelines are much too lenient, allowing for 55 dB(A) - or 55 dB(A) if the ambient sound pressure level exceeds 55 dB(A) (as may be the case during a severe wind storm).

The state's guidelines note normal conversation is in the range of 50 to 65 dB(A), and while James agreed that's the normal conversation range, he said it's wrong to set the noise limit at the same level as a normal conversation. "We're not talking about interfering with conversations," he said. "We're talking about land

use capability ... and the limit of 55 dB(A) is not a good limit."

James said during the night time hours, 55 dB(A) sounds louder and is more noticeable than during the day hours because there's little activity going on. He said if 55 dB(A) is the standard, and the same as a normal conversation, then those living in the township have to ask themselves if they could tolerate sleeping near an operating wind turbine.

"I have to ask myself, could I sleep with someone talking outside my window?" James asked.

Another thing planners have to consider is how close a house will be from a turbine. If it's located extremely close to the house, sound wouldn't enter the house through walls (which are heavily insulated), but through the roof (which doesn't insulate noise as well as walls).

Regardless of where noise may enter a house located near a turbine, James said wind turbines emit infrared frequencies.

"Anything short of a concrete wall can't stop infrared frequencies," he said, noting infrared frequencies are very large pressure waves that are hard to measure.

The acoustics field does not know much about infrared sound, and for years, acousticians didn't even address the effects of infrared sounds because they are so uncommon - limited to things like earthquakes and thunder, James said. "This is one of the issues that I think really needs investigation before we start putting wind turbines up too close to homes," he said.

James said there isn't much information about how infrared sound - or sound emitted from wind turbines - can affect a person's health.

However, he cited data from a research paper published in the early 1980s by G. Rasmussen (and later cited in more recent studies), as showing infrared sounds can result in symptoms of discomfort, head symptoms, influence on speech, lump in throat, chest pains, abdominal pains, urge to urinate, and influence on breathing movements.

James said preliminary data from a recent study in the U.S. that studied about seven people living near turbines shows the study's participants' health were affected as there were physical changes to the chest cavity and brain.

He cited another paper published in 2000 that found low frequency noise can disturb the rest and sleep even at low sound levels.

The World Health Organization also has recognized low frequency noise as an environmental problem, James said.

James said he's challenged the wind industry to prove wind turbines do not cause these kinds of health problems, saying wind developers only look at audible noise, not infrared noise which may be harmful.

He cited a study from 2002 that found 40 percent of participants living near a wind park said they were annoyed when levels surpassed 40 dB(A). One thing to consider when looking at annoyance factors, James said is that residents in rural areas may be more annoyed by noises emitted from wind turbines because they have a higher level of expectation for quietness than their urban counterparts.

Another thing to consider, he said, is that while 90 percent of the community can handle the noise and the effects of noise emitted from wind turbines, there's a vulnerable population that can't - including children 6 years of age or younger, and adults 65 and older.

James recommended the township include in its wind ordinance requirements including a specific type of instrumentation used to measure noise when winds are low; pre-building and post-construction tests; and having an outside, independent consultant do the pre-building and post-construction at the expense of the wind developer.

Since most local governments don't have the capability to successfully monitor sound, they can't successfully study an entire area of development. Instead, they rely on the wind developer to do so, which James compared to letting the wolf guard the chickens.

That's why he said an outside, independent expert should be brought in to conduct the pre-building and post-construction noise studies.

James said the township also might want to consider when writing its ordinance to include rules and procedures for complaint resolution.

Nance said James' presentation requires professional review.

"There were a lot of statements made based on not-fully documented studies," he said. "But it's interesting."

**Web link:** [http://www.michigansthumb.com/site/news.cfm?newsid=19523879&BRD=2292&PAG=461&dept\\_id=571474&rfi=6](http://www.michigansthumb.com/site/news.cfm?newsid=19523879&BRD=2292&PAG=461&dept_id=571474&rfi=6)