



**CHAMPAIGN COUNTY BOARD
DATA CENTER ACTIVITIES TASK FORCE**

County of Champaign, Urbana, Illinois
Monday, August 03, 2026 - 6:30 p.m.

Shields-Carter Meeting Room
Bennett Administrative Center
102 E. Main St., Urbana

Committee Members:

Aaron Esry – Vice Chair
Carly McCrory-McKay
Andrew Rehn
Dirk Rice
Dennise Arres

Emily Rodriguez - Chair
Kevin Sage
Deb Newell
Amy Young

Agenda Items

- I. Call to Order**
- II. Roll Call**
- III. Approval of Agenda/Addendum**
- IV. Public Input**
- V. Communications (discussion only)**
- VI. New Business (discussion only)**
 - a. Memorandum – Revised noise limit and all other proposed requirements for a BIG DATA CENTER
- VII. Other Business**
 - a. Date of next meeting (discussion only)
 - i. August 31, 2026 – Public Review of Proposed Ordinance
- VIII. Chair's Report**
- IX. Next Steps (discussion only)**
- X. Adjournment**

TO: **Data Center Task Force**

FROM: **John Hall, Zoning Administrator**

DATE: **July 29, 2026**

RE: **Revised noise limit and all other proposed requirements for a BIG DATA CENTER**

Champaign County
Department of

**PLANNING &
ZONING**

Bennett Administrative Center
102 East Main Street
Urbana, Illinois 61801

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BACKGROUND

At the July 13, 2026, meeting the Task Force requested a revised noise requirement and a compilation of all standards reviewed so far.

World Health Organization Recommendation for Limits on Low Frequency Sound

The Task Force requested a revised noise standard to address concerns about low-frequency noise and the World Health Organization was suggested as a possible source of information. The World Health Organization's 2022 requirements for environmental noise are included as Attachment B.

The WHO has no recommended limit on low-frequency sound. The WHO does have a recommendation for limiting wind turbine noise (low frequency noise is a common complaint regarding wind turbine noise) and that limit is 45 L_{den}. "L_{den}" is a noise limit that establishes three noise limits over a 24-hour period as follows:

- Between the hours of 7 a.m. and 7 p.m. the noise limit is 45 dBA.
- Between the hours of 7 p.m. and 10 p.m. the noise limit is 40 dBA.
- Between the hours of 10 p.m. to 7 a.m. the noise limit is 35 dBA.

In total, the three noise limits have the effect of reducing the overall average allowable noise level to 38 dBA.

The Task Force may be interested to know that the Environment and Land Use Committee (ELUC) had authorized a text amendment to reduce the allowable noise level from industrial wind turbines to 45dBA in Zoning Case 075-AT-22. That zoning case was ultimately withdrawn due to the adoption of House Bill (HB) 4412 in January 2023 that made the IPCB noise regulations the State standard for wind farm noise regulation.

Attachment C is a letter from an acoustical consultant that was provided in the build up to Zoning Case 075-AT-22. Much of the letter is about low frequency noise and is therefore relevant to the Task Force concerns. The letter is addressed to Brookfield Renewables, the owner of Champaign County's only wind farm, because the wind farm owner was very interested in Zoning Case 075-AT-22, and the letter was submitted to the County as public comment.

Also, Champaign County has received noise studies of the ambient rural noise level at three different locations in three zoning cases (one wind farm and two solar farms). The average ambient noise level measured in those three zoning cases was 55.8 dBA.

Attachment A includes a choice of two noise limits- 45dBA or 45 L_{den}, on page 17 of the attachment.

Post-Construction Noise Study Requirement

A post-construction noise study has been added as a requirement after each phase of Big Data Center construction. The Zoning Use Permit fee includes a \$60,000 fee (increased from

\$50,000 that was part of Zoning Case 075-AT-22) to pay for the post-construction noise study. The text for the post construction noise requirement was taken from Zoning Case 075-AT-22.

Post-Construction Vibration Study Requirement

A post-construction vibration study has also been added as a requirement after each phase of Big Data Center construction including a fee of \$60,000 to pay for the post-construction vibration study. The post-construction vibration study section (see pages A-8 to A-10) is identical to the post-construction noise study section (pages A-17 to A-20) except that there are no standards for the vibration study.

Fees

Fees have been added for both the Special Use Permit and the Zoning Use Permit. Both fees are based on the megawatt rating the same fees as for a PV Solar Farm.

The Zoning Use Permit fee includes the \$60,000 fee for the post-construction noise study and a \$60,000 fee to pay for the post-construction vibration study.

Proposed Text Amendment

Attachment B includes all standard conditions previously reviewed by the Task Force. Material that is not highlighted or struck out is the same as what was reviewed by the Environment and Land Use Committee (ELUC) on February 5, 2026. Material that has been added by the Task Force is highlighted in yellow. Green highlight identifies decision points where the Task Force needs to decide between alternative requirements. The decision points are as follows:

- Power ratings for BIG DATA CENTERS (see item 1. on page 1)
- Noise limit (see p. 17)
- Required amount of on-site clean energy (see p. 27)
- Prohibition on nuclear based on-site energy production (see p. 27)

ATTACHMENTS

A Proposed Text Amendment

B Environmental noise. In: Compendium of WHO and other UN guidance on health and environment, 2022 update. Geneva: World Health Organization; 2022 (WHO/HEP/ECH/EHD/22.01). Licence: CC BY-NC-SA 3.0 IGO.

C Letter to Ben Mallernee, Brookfield Renewables, dated June 20, 2022, from Michael Hankard, owner and principal acoustical consultant of Hankard Environmental

1. Add the following to Section 3 Definitions:

DATA CENTER: A facility where computing and networking equipment is concentrated for the purpose of collecting, storing, processing, distributing or allowing access to large amounts of data (collectively referred to as processing) and that has less than 10,000 square feet of processing area and that has a total power rating less than {24 / 36} megawatts. Processing area shall include the area of any building that is principally used for processing. This definition does not include facilities owned or leased by a single organization to house its own Information Technology infrastructure including servers, data storage, and network equipment so long as the DATA CENTER is co-located with other facilities of that organization.

DATA CENTER, BIG: A facility where computing and networking equipment is concentrated for the purpose of collecting, storing, processing, distributing or allowing access to large amounts of data (collectively referred to as processing) and that has at least 10,000 square feet of processing area or a total power rating of {24 / 36} megawatts or greater. Processing area shall include the area of any building that is principally used for processing. Multiple BIG DATA CENTERS may be authorized under one County Board SPECIAL USE Permit

2. Amend Section 5.2 as follows:

SECTION 5.2 TABLE OF AUTHORIZED PRINCIPAL USES

BIG DATA CENTER would be a new land use allowed by County Board Special Use Permit in the AG-2 Agriculture, B-4 General Business, and I-1 Light Industry Zoning Districts, as shown in the table below

Principal USES	Zoning DISTRICTS														
	CR	AG-1	AG-2	R-1	R-2	R-3	R-4	R-5	B-1	B-2	B-3	B-4	B-5	I-1	I-2
DATA CENTER			S									S		S	
BIG DATA CENTER ³⁴			B									B		B	

3. Add new Footnote 34 under Section 5.2 as follows:

34. A BIG DATA CENTER is subject to the requirements of Section 6.1.7 of the Zoning Ordinance.

4. Add new Section 6.1.7 as follows:

6.1.7 BIG DATA CENTER

A BIG DATA CENTER County Board SPECIAL USE Permit may only be authorized in the AG-2 Agriculture Zoning DISTRICT, B-4 General Business, or I-1 Light Industry Zoning District, subject to the following standard conditions.

A. General Standard Conditions

- (1) The area of the BIG DATA CENTER County BOARD SPECIAL USE Permit must include the following minimum areas:
 - a. All land that will be exposed to a noise level greater than that authorized to Class A land as established by 35 Ill. Admin. Code Parts 900, 901 and 910 under paragraph 6.1.5I.
 - b. All necessary access lanes or driveways and any required new PRIVATE ACCESSWAYS. For purposes of determining the minimum area of the SPECIAL USE Permit, access lanes or driveways shall be provided a minimum 40 feet wide area.
 - c. All necessary BIG DATA CENTER STRUCTURES and ACCESSORY STRUCTURES including electrical distribution lines, inverters, transformers, common switching stations, and substations not under the ownership of a PUBLICLY REGULATED UTILITY and all water wells that will provide water for the BIG DATA CENTER. For purposes of determining the minimum area of the SPECIAL USE Permit, underground cable installations shall be provided a minimum 40 feet wide area.
- (2) Interconnection to the power grid
 - a. The BIG DATA CENTER County Board SPECIAL USE permit application shall include documentation that the applicant or BIG DATA CENTER is in the queue to acquire an interconnection agreement to the power grid.
 - b. Documentation of an executed interconnection agreement with the appropriate electric utility shall be provided prior to issuance of a Zoning Compliance Certificate to authorize operation of the BIG DATA CENTER.
- (3) Right to farm
 - a. The owners of the subject property and the Applicant, its successors in interest, and all parties to the decommissioning plan and site reclamation plan hereby recognize and provide for the right of agricultural activities to continue on adjacent land consistent with the Right to Farm Resolution 3425.

B. Minimum LOT Standards

- (1) There are no minimum LOT AREA, AVERAGE LOT WIDTH, or maximum LOT COVERAGE requirements for a BIG DATA CENTER notwithstanding other requirements of Section 5.3.
- (2) There is no maximum LOT AREA requirement on BEST PRIME FARMLAND.
- (3) Multiple BIG DATA CENTERS may be authorized on the same LOT under one County Board SPECIAL USE Permit.

C. Minimum Standard Conditions for Separations for BIG DATA CENTER from adjacent USES and STRUCTURES

The location of each BIG DATA CENTER shall provide the following required separations as measured from the exterior of the above ground portion of the BIG DATA CENTER STRUCTURES and equipment including fencing:

- (1) BIG DATA CENTER fencing shall be set back from the street centerline a minimum of 40 feet from a MINOR STREET and a minimum 55 feet from a COLLECTOR STREET and a minimum of 60 feet from a MAJOR STREET unless a greater separation is required for screening pursuant to Section 6.1.5M.2.a. but in no case shall the perimeter fencing be less than 10 feet from the RIGHT OF WAY of any STREET.
- ~~(2) For any adjacent LOT that is 10 acres or less in area (not including the STREET RIGHT OF WAY):-~~
 - ~~(a) For any adjacent LOT that is bordered (directly abutting and/or across the STREET) on no more than two sides by the BIG DATA CENTER, the separation shall be no less than 240 feet from the property line.~~
 - ~~(b) For any adjacent LOT that is bordered (directly abutting and/or across the STREET) on more than two sides by the BIG DATA CENTER, the separation shall exceed 240 feet as deemed necessary by the BOARD.~~
- ~~(3) For any adjacent LOT that is more than 10 acres in area (not including the STREET RIGHT OF WAY), the separation shall be no less than 255 feet from any existing DWELLING or existing PRINCIPAL BUILDING and otherwise the perimeter fencing shall be a minimum of 10 feet from a SIDE or REAR LOT LINE. This~~

~~separation distance applies to properties that are adjacent to or across a STREET from a BIG DATA CENTER.~~

- (2) Each BIG DATA CENTER BUILDING shall have FRONT, SIDE and REAR YARDS that are equivalent to the HEIGHT of the BUILDING notwithstanding other requirements of Section 5.3.
- (3) For properties not participating in the BIG DATA CENTER, the minimum separation to the nearest NONPARTICIPATING PRINCIPAL BUILDING shall be 1,000 feet measured from the nearest BIG DATA CENTER structures and equipment to the PRINCIPAL BUILDING except that no roof mounted chillers may be located less than 1,500 feet from the nearest PRINCIPAL BUILDING. This separation may be reduced by a PRIVATE WAIVER signed by the owner of the PRINCIPAL BUILDING. No minimum separation shall be required to a building on an electrical substation property or to a building on a PARTICIPATING PV SOLAR FARM or a PARTICIPATING WIND FARM.
- (4) Additional separation may be required to ensure that the noise level required by 35 Ill. Admin. Code Parts 900, 901 and 910 is not exceeded or for other purposes deemed necessary by the BOARD.
- (5) A separation of at least 500 feet between substations and transmission lines of greater than 34.5 kVA to adjacent dwellings and residential DISTRICTS.

D. Standard Conditions for Design and Installation of any BIG DATA CENTER.

- (1) Any building that is part of a BIG DATA CENTER shall include as a requirement for a Zoning Compliance Certificate, a certification by an Illinois Professional Engineer or Illinois Licensed Structural Engineer or other qualified professional that the constructed building conforms to Public Act 103-0510 regarding building code compliance and also conforms to the Illinois Accessibility Code.
- (2) Electrical Components
 - a. All electrical components of the BIG DATA CENTER shall conform to the National Electrical Code as amended and shall comply with Federal Communications Commission (FCC) requirements.

- b. Burying power and communication wiring underground shall be minimized consistent with best management practice regarding BIG DATA CENTER construction and minimizing impacts on agricultural drainage tile.
- (3) Maximum Height. The height limitation established in Section 5.3 shall not apply to a BIG DATA CENTER. The maximum height of all above ground STRUCTURES shall be identified in the application and as approved in the County Board SPECIAL USE Permit.
- (4) Required PARKING SPACES.
 - a. There shall be one PARKING SPACE provided per each employee based upon the maximum number of employees employed during any work period.
 - b. There shall be a minimum of one additional PARKING SPACE identified as a visitor PARKING SPACE.
 - c. All PARKING SPACES shall be surfaced with an all-weather dustless material.
 - d. Required parking SCREENS shall be as required by Section 7.4.1C.4.
- (5) Warnings. A reasonably visible warning sign concerning voltage must be placed at the base of all pad-mounted transformers and substations.
- (6) No construction may intrude on any easement or right-of-way for a GAS PIPELINE or HAZARDOUS LIQUID PIPELINE, an underground water main or sanitary sewer, a drainage district ditch or tile, or any other public utility facility unless specifically authorized by a crossing agreement that has been entered into with the relevant party.
- (7) Backup power generators.
 - a. All backup power generators must at a minimum comply with the standards set forth in the Municipal and Cooptative Electric Utility Transparent Planning Act (220 ILCS 31), or as subsequently amended, including but not limited to final Tier 4 emission standards in 415 ILCS 5.39(a).

- b. Roof-mounted backup power generators are prohibited.
- c. All backup power generators must be equipped with vibration isolation systems and mufflers and sound attenuating enclosures or canopies.
- d. Sound attenuation walls and sound absorption panels on the exterior of building walls shall be provided around all backup power generators if necessary to meet the noise requirements. Sound attenuation walls shall be equal in height to, or taller than, the tallest ground mounted generator.
- e. Testing of backup power generators may only occur between the hours of 9:00 a.m. and 5:00 p.m. Monday through Friday and not on holidays. No more than two generators can be tested simultaneously. Logs of testing times shall be maintained and provided if requested by the Zoning Administrator.
- f. Backup power generators shall only operate during bona fide power outages or during testing.
- g. Fuel system installations for backup power generators shall meet the requirements of the Illinois State Fire Marshal. Secondary containment shall be provided for diesel fuel storage.

(8) Control of vibrations

- a. A BIG DATA CENTER must have continuous vibration monitoring at a spacing interval of not less than 500 feet along all property lines within 1,000 feet of any residential, hospital, or educational use.
- b. The BIG DATA CENTER special use PERMIT shall not be affected by the subsequent establishment of future land uses on adjacent properties.
- c. No BIG DATA CENTER activity or operation shall cause or create earth borne vibrations in excess of the displacement values given below. Continuous measurement of earth borne vibrations shall be made at the BIG DATA CENTER lot line, as described below:

- (a) Vibration displacements shall be measured with an instrument or complement of instruments capable of simultaneously measuring in three mutually perpendicular directions.
- (b) The maximum vector shall be less than the maximum allowed vibration displacement.
- (c) For the purpose of this Section, steady state vibrations are vibrations which are continuous, or vibrations in discrete impulses more frequent than one hundred impulses per minute. Discrete impulses which do not exceed one hundred impulses per minute shall be considered impact vibrations.
- (d) The maximum allowed vibration displacement shall be determined by the following formula:

$$D = K / f$$

D = displacement in inches

K = a constant to be determined by reference to Table 6.1.7D.(7)(e)

f = the frequency of the vibration transmitted through the ground expressed in cycles per second.

Table 6.1.7D.(7)(e) K value to be used in measuring ground vibrations

On any neighboring lot:	K
Steady state	0.008
Impulsive	0.015
Less than 8 pulses per 24-hour period	0.037
In any Residential District:	K
Steady state	0.003
Impulsive	0.006
Less than 8 pulses per 24-hour period	0.015

- d. Post-construction verification of BIG DATA CENTER operational ground vibrations:
 - (a) Any application for a BIG DATA CENTER ZONING USE permit shall include a fee for a Post-construction BIG DATA CENTER Vibration Study to be conducted after each phase. The fee for the Post-construction BIG DATA CENTER Vibration Study shall be held by the COUNTY and used to pay for a qualified vibration consultant to conduct the Post-construction BIG DATA CENTER Vibration Study. Any excess fees shall be refunded to the applicant upon the approval of the Noise Study for the last phase and any additional fees necessary to cover the full cost of the Vibration Study will be billed to the BIG DATA CENTER owner.
 - (b) Within the first year of BIG DATA CENTER operation for each phase, the BIG DATA CENTER owner shall allow and cooperate with the COUNTY to conduct a post-construction vibration study including vibration monitoring, data analysis, and preparation of a report intended to verify if the vibration generated by the BIG DATA CENTER is in general compliance with the BIG DATA CENTER approval. The COUNTY shall select a qualified vibration consultant to conduct the Post-construction BIG DATA CENTER Vibration Study.
 - (c) The Post-construction BIG DATA CENTER Vibration Study shall be performed following nationally recognized best practices.
 - (d) Vibration monitoring timing and duration.
 - i. Vibration monitoring shall occur continuously during both daytime and nighttime in whatever season is considered to be the most problematic for generation and control of vibration.
 - ii. Every effort should be made to conduct vibration monitoring during times of maximum

BIG DATA CENTER operation including simultaneous operation of all back-up power generators and air conditioning systems.

(e) The entire post-construction vibration study shall be documented in a written final report that shall be approved by the GOVERNING BOARD upon a recommendation from the Champaign County Board's Environment and Land Use Committee. Approval of the written final report shall not confer approval of any exceedance of the allowable vibration level.

i. The final report shall include a written narrative conclusion regarding how well the monitored results compare to the allowable vibration level and the predicted vibration levels for the BIG DATA CENTER. Explain any unfavorable results or exceedances of the allowable vibration level.

(f) After construction of the BIG DATA CENTER, the Zoning Administrator shall take appropriate enforcement action as necessary to investigate vibration complaints in order to determine the validity of the complaints and take any additional enforcement action as warranted to stop any violation that is occurring, including but not limited to the following:

i. The Zoning Administrator shall make the Environment and Land Use Committee aware of complaints about violation that have been received by the Complaint Hotline.

ii. If the Environment and Land Use Committee determines that the vibration is excessive, the Environment and Land Use Committee and/or the County Board shall require the Owner or Operator to take reasonable steps to investigate and mitigate the excessive vibration including a vibration verification study.

iii. The County Board reserves the right to hire a vibration consultant to determine if the vibration

produced by the BIG DATA CENTER is consistent with the approved SPECIAL USE Permit.

- iv. In the event that a violation of the SPECIAL USE Permit is identified the Zoning Administrator may require the BIG DATA CENTER owner to take whatever actions are necessary to stop the violation and comply with the vibration limits. The Zoning Administrator may seek direction from the Environment and Land Use Committee regarding the actions necessary to stop the violation.

- (8) Ground mounted and roof mounted mechanical equipment must be enclosed by sound attenuating walls equal in height to, or taller than, the tallest ground mounted or roof mounted mechanical equipment.

E. Standard Conditions to Protect Agricultural Drainage

- a. The applicant shall endeavor to locate all existing agricultural drainage tile prior to establishing any construction staging areas, construction of any necessary BIG DATA CENTER access lanes or driveways, construction of any BIG DATA CENTER STRUCTURES, any common switching stations, substations, and installation of underground wiring or cabling. The applicant shall contact affected landowners and tenants and the Champaign County Soil and Water Conservation District and any relevant drainage district for their knowledge of tile line locations prior to the proposed construction. Drainage districts shall be notified at least two weeks prior to disruption of tile.
- b. The location of drainage district tile lines shall be identified prior to any construction and drainage district tile lines shall be protected from disturbance as follows:
 - (a) All identified drainage district tile lines and any known existing drainage district tile easement shall be staked or flagged prior to construction to alert construction crews of the presence of drainage district tile and the related easement.
 - (b) Any drainage district tile for which there is no existing easement shall be protected from disturbance by a 30 feet wide no-construction buffer on either side of the drainage

district tile. The no-construction buffer shall be staked or flagged prior to the start of construction and shall remain valid for the lifetime of the BIG DATA CENTER County Board SPECIAL USE Permit and during any deconstruction activities that may occur pursuant to the BIG DATA CENTER County Board SPECIAL USE Permit.

- (c) Construction shall be prohibited within any existing drainage district easement and also prohibited within any 30 feet wide no-construction buffer on either side of drainage district tile that does not have an existing easement unless specific construction is authorized in writing by all commissioners of the relevant drainage district. A copy of the written authorization shall be provided to the Zoning Administrator prior to the commencement of construction.
- c. Any agricultural drainage tile located underneath construction staging areas, access lanes, driveways, any common switching stations, and substations shall be replaced as required in Section 6.3 of the Champaign County Storm Water Management and Erosion Control Ordinance.
- d. Any agricultural drainage tile that must be relocated shall be relocated as required in the Champaign County Storm Water Management and Erosion Control Ordinance.
- e. Conformance of any relocation of drainage district tile with the Champaign County Storm Water Management and Erosion Control Ordinance shall be certified by an Illinois Professional Engineer. Written approval by the drainage district shall be received prior to any backfilling of the relocated drain tile and a copy of the approval shall be submitted to the Zoning Administrator. As-built drawings shall be provided to both the relevant drainage district and the Zoning Administrator of any relocated drainage district tile.
- f. All tile lines that are damaged, cut, or removed shall be staked or flagged in such manner that they will remain visible until the permanent repairs are completed.
- g. All exposed tile lines shall be screened or otherwise protected to prevent the entry into the tile of foreign materials, loose soil, small mammals, etc.

- h. Permanent tile repairs shall be made within 14 days of the tile damage provided that weather and soil conditions are suitable or a temporary tile repair shall be made. Immediate temporary repair shall also be required if water is flowing through any damaged tile line. Temporary repairs are not needed if the tile lines are dry and water is not flowing in the tile provided the permanent repairs can be made within 14 days of the damage.
- i. All damaged tile shall be repaired so as to operate as well after construction as before the construction began.
- j. Following completion of the BIG DATA CENTER construction, the applicant shall be responsible for correcting all tile line repairs that fail, provided that the failed repair was made by the Applicant.

F. Standard Conditions for Use of Public Streets

Any BIG DATA CENTER Applicant proposing to use any County Highway or a township or municipal STREET for the purpose of transporting BIG DATA CENTER or Substation parts and/or equipment for construction, operation, or maintenance of the BIG DATA CENTER or Substation(s), shall identify all such public STREETS and pay the costs of any necessary permits and the costs to repair any damage to the STREETS caused by the BIG DATA CENTER construction, as follows:

- (1) Prior to the close of the public hearing before the BOARD, the Applicant shall enter into a Roadway Upgrade and Maintenance agreement approved by the County Engineer and State's Attorney; or Township Highway Commissioner; or municipality where relevant, except for any BIG DATA CENTER for which the relevant highway authority has agreed in writing to waive the requirements of subparagraphs 6.1.9F.1, 6.1.9F.2, and 6.1.9F.3, and the signed and executed Roadway Upgrade and Maintenance agreements must provide for the following minimum conditions:
 - a. The applicant shall agree to conduct a pre- BIG DATA CENTER construction baseline survey to determine existing STREET conditions for assessing potential future damage including the following:
 - (a) A videotape of the affected length of each subject STREET supplemented by photographs if necessary.
 - (b) Pay for costs of the County to hire a consultant to make a study of any structure on the proposed route

- that the County Engineer feels may not carry the loads likely during the BIG DATA CENTER construction.
- (c) Pay for any strengthening of STREET structures that may be necessary to accommodate the proposed traffic loads caused by the BIG DATA CENTER construction.
 - b. The Applicant shall agree to pay for costs of the County Engineer to hire a consultant to make a study of any structure on the proposed route that the County Engineer feels may not carry the loads likely during the BIG DATA CENTER construction and pay for any strengthening of structures that may be necessary to accommodate the proposed traffic loads caused by the BIG DATA CENTER construction.
 - c. The Applicant shall agree upon an estimate of costs for any other necessary roadway improvements prior to construction.
 - d. The Applicant shall obtain any necessary approvals for the STREET improvements from the relevant STREET maintenance authority.
 - e. The Applicant shall obtain any necessary Access Permits including any required plans.
 - f. The Applicant shall erect permanent markers indicating the presence of underground cables.
 - g. The Applicant shall install marker tape in any cable trench.
 - h. The Applicant shall become a member of the Illinois statewide One-Call Notice System (otherwise known as the Joint Utility Locating Information for Excavators or “JULIE”) and provide JULIE with all of the information necessary to update its record with respect to the BIG DATA CENTER.
 - i. The Applicant shall use directional boring equipment to make all crossings of County Highways for the cable collection system.

- j. The Applicant shall notify the STREET maintenance authority in advance of all oversize moves and crane crossings.
- k. The Applicant shall provide the County Engineer with a copy of each overweight and oversize permit issued by the Illinois Department of Transportation for the BIG DATA CENTER construction.
- l. The Applicant shall transport the BIG DATA CENTER loads so as to minimize adverse impact on the local traffic including farm traffic.
- m. The Applicant shall schedule BIG DATA CENTER construction traffic in a way to minimize adverse impacts on emergency response vehicles, rural mail delivery, school bus traffic, and local agricultural traffic.
- n. The Applicant shall provide as much advance notice as in commercially reasonable to obtain approval of the STREET maintenance authority when it is necessary for a STREET to be closed due to a crane crossing or for any other reason. Notwithstanding the generality of the aforementioned, the Applicant will provide 48 hours notice to the extent reasonably practicable.
- o. The Applicant shall provide signs indicating all highway and STREET closures and work zones in accordance with the Illinois Department of Transportation Manual on Uniform Traffic Control Devices.
- p. The Applicant shall establish a single escrow account and a single Irrevocable Letter of Credit for the cost of all STREET upgrades and repairs pursuant to the BIG DATA CENTER construction.
- q. The Applicant shall notify all relevant parties of any temporary STREET closures.
- r. The Applicant shall obtain easements and other land rights needed to fulfill the Applicant's obligations under this Agreement.
- s. The Applicant shall agree that the County shall design all STREET upgrades in accordance with the most recent

- edition of the IDOT Bureau of Local Roads and Streets Manual.
- t. The Applicant shall provide written Notice to Proceed to the relevant STREET maintenance authority by December 31 of each year that identifies the STREETS to be upgraded during the following year.
 - u. The Applicant shall provide dust control and grading work to the reasonable satisfaction of the County Engineer on STREETS that become aggregate surface STREETS.
 - v. The Applicant shall conduct a post- BIG DATA CENTER construction baseline survey similar to the pre- BIG DATA CENTER construction baseline survey to identify the extent of repairs necessary to return the STREETS to the pre- BIG DATA CENTER construction condition.
 - w. The Applicant shall pay for the cost of all repairs to all STREETS that are damaged by the Applicant during the construction of the BIG DATA CENTER and restore such STREETS to the condition they were in at the time of the pre- BIG DATA CENTER construction inventory.
 - x. All BIG DATA CENTER construction traffic shall exclusively use routes designated in the approved Transportation Impact Analysis.
 - y. The Applicant shall provide liability insurance in an acceptable amount to cover the required STREET construction activities.
 - z. The Applicant shall pay for the present worth costs of life consumed by the construction traffic as determined by the pavement management surveys and reports on the roads which do not show significant enough deterioration to warrant immediate restoration.
 - aa. Provisions for expiration date on the agreement.
 - bb. Other conditions that may be required.
- (2) A condition of the County Board SPECIAL USE Permit approval shall be that the Zoning Administrator shall not authorize a Zoning Use Permit for the BIG DATA CENTER until the County Engineer and State's Attorney, or Township Highway Commissioner, or

municipality where relevant, has approved a Transportation Impact Analysis provided by the Applicant and prepared by an independent engineer that is mutually acceptable to the Applicant and the County Engineer and State's Attorney, or Township Highway Commissioner, or municipality where relevant, that includes the following:

- a. Identify all such public STREETS or portions thereof that are intended to be used by the Applicant during construction of the BIG DATA CENTER as well as the number of loads, per axle weight of each load, and type of equipment that will be used to transport each load.
 - b. A schedule of the across road culverts and bridges affected by the project and the recommendations as to actions, if any, required with respect to such culverts and bridges and estimates of the cost to replace such culverts and bridges.
 - c. A schedule of the anticipated STREET repair costs to be made in advance of the BIG DATA CENTER construction and following construction of the BIG DATA CENTER.
 - d. The Applicant shall reimburse the County Engineer, or Township Highway Commissioner, or municipality where relevant, for all reasonable engineering fees including the cost of a third-party consultant, incurred in connection with the review and approval of the Transportation Impact Analysis.
- (3) At such time as decommissioning takes place, the Applicant or its successors in interest shall enter into a Roadway Use and Repair Agreement with the appropriate highway authority.
- G. Standard Conditions for Coordination with Local Fire Protection District
- (1) The Applicant shall submit to the local fire protection district a copy of the site plan.
 - (2) Upon request by the local fire protection district, the Owner or Operator shall cooperate with the local fire protection district to develop the fire protection district's emergency response plan.
 - (3) Nothing in this section shall alleviate the need to comply with all other applicable fire laws and regulations.

H. Standard Conditions for Allowable Noise Level

- (1) Noise levels from any BIG DATA CENTER shall be ~~in compliance with the applicable Illinois Pollution Control Board (IPCB) regulations (35 Illinois Administrative Code, Subtitle H: Noise, Parts 900, 901, 910).~~ **limited to no** more than **45 dBA / 45 L_{den}**.
- (2) The Applicant shall submit manufacturer's sound power level characteristics and other relevant data regarding noise characteristics of proposed BIG DATA CENTER equipment including back-up power generators and HVAC equipment and any other sound producing equipment necessary for a competent noise analysis.
- (3) The Applicant, through the use of a qualified professional, as part of the siting approval application process, shall appropriately demonstrate compliance with the above noise requirements as follows:
 - a. The SPECIAL USE Permit application for a BIG DATA CENTER shall include a noise analysis that includes the following:
 - (a) The pre-development 24-hour ambient background sound level shall be identified at representative locations near the site of the proposed BIG DATA CENTER.
 - (b) Computer modeling shall be used to generate the anticipated sound level resulting from the operation of the proposed BIG DATA CENTER within 1,500 feet of the proposed BIG DATA CENTER. **The modeling shall assume that all back-up power generators are running and the HVAC equipment and any other sound producing equipment are running at the maximum.**
 - (c) Results of the ambient background sound level monitoring and the modeling of anticipated sound levels shall be clearly stated in the application and the application shall include a map of the modeled noise contours within 1,500 feet of the proposed BIG DATA CENTER.

- (d) The application shall also clearly state the assumptions of the computer model's construction and algorithms so that a competent and objective third party can as simply as possible verify the anticipated sound data and sound levels.
- (4) Post-construction verification of BIG DATA CENTER operational noise level:
 - a. Any application for a BIG DATA CENTER ZONING USE permit shall include a fee for a Post-construction BIG DATA CENTER Noise Study to be conducted after each phase. The fee for the Post-construction BIG DATA CENTER Noise Study shall be held by the COUNTY and used to pay for a qualified noise consultant to conduct the Post-construction BIG DATA CENTER Noise Study. Any excess fees shall be refunded to the applicant upon the approval of the Noise Study for the last phase and any additional fees necessary to cover the full cost of the Noise Study will be billed to the BIG DATA CENTER owner.
 - b. Within the first year of BIG DATA CENTER operation for each phase, the BIG DATA CENTER owner shall allow and cooperate with the COUNTY to conduct a post-construction noise study including noise monitoring, data analysis, preparation of a report intended to verify if the noise generated by the BIG DATA CENTER is in compliance with the Allowable Noise Level and in general compliance with the BIG DATA CENTER approval. The COUNTY shall select a qualified noise consultant to conduct the Post-construction BIG DATA CENTER Noise Study.
 - c. The post-construction noise study shall include noise monitoring as near as possible to each PRINCIPAL STRUCTURE within 1,500 feet of the BIG DATA CENTER. The locations shall be agreeable to the COUNTY and to the BIG DATA CENTER owner.
 - d. Noise monitoring timing and duration.
 - (a) Noise monitoring shall occur continuously during both daytime and nighttime in whatever season is considered to be the most problematic for generation and control of noise.
 - (b) Every effort should be made to conduct noise monitoring during times of maximum BIG DATA CENTER operation

including simultaneous operation of all back-up power generators and air conditioning systems.

(c) Sound pressure level, audio recordings, and meteorological data should be collected at each monitoring location.

(d) Pre-development ambient noise shall also be monitored and analyzed and included in the report.

e. Noise measurement standards.

(a) American National Standards Institute (ANSI) S1.4-1983 (R2006) American National Standard Specifications for Sound Level Meters.

(b) ANSI S1.13-2005 (R2010) American National Standard Measurement of Sound Pressure Level in Air.

(c) ANSI S2.9-Part 3- 2013 American National Standard Quantities and Procedures for Description and Measurement of Environmental Sound- Part 3: Short-Term Measurements with an Observer Present.

(d) ANSI S12.18-1994 (R2009) Outdoor Measurement of Sound Pressure Level.

(e) ANSI S12.100 American National Standard Methods to Determine and Measure the Residual Sound in Protected Natural and Quiet Residential Areas.

(f) 35 Ill. Admin. Code 910.105 and 106, where not in conflict with any of the above.

f. Data analysis.

(a) Care must be taken to exclude any ambient noise that may interfere with measurement of noise from the BIG DATA CENTER. Examples include noise from agricultural harvesting activities and noise from vehicular and train traffic. Exclusion of such data should be documented in the final report.

(b) Noise measurements should be excluded at wind speeds above 5 meter per second (11 miles per hour). Each monitoring location should have an anemometer.

- (c) “Spikes” of sporadic noise, such as a motorized vehicle passing by, or a clap of thunder, or a dog barking may be eliminated from the data as long as an explanation with validation is included in the final report.
- (d) Best practices shall be used in the analysis of the noise monitoring data.

g. Data reporting.

- (a) The entire post-construction noise study shall be documented in a written final report that shall be approved by the GOVERNING BOARD upon a recommendation from the Champaign County Board’s Environment and Land Use Committee. Approval of the written final report shall not confer approval of any exceedance of the allowable noise level.
- (b) The final report shall at a minimum include the following:
 - i. Scaled maps of all the BIG DATA CENTER PREMISES, all monitoring locations, all residences and/or PRINCIPAL STRUCTURES or BUILDINGS within one mile of the BIG DATA CENTER PREMISES.
 - ii. Continuous sound measurements at all wind speeds that occurred during monitoring and charts illustrating the time series measurements.
 - iii. One-third octave band analysis of data recorded at each monitoring location.
 - iv. Use monitoring results to assess sound measurements over the range of sound frequencies to estimate the total noise level while the BIG DATA CENTER is in operation. Present these results in charts and tables as appropriate.
 - v. Compare the monitoring results to the allowable noise level and highlight any exceedances.
 - vi. Include a written narrative conclusion regarding how well the monitored results compare to the allowable noise level and the predicted sound levels for the BIG DATA CENTER. Explain any

unfavorable results or exceedances of the allowable noise level.

- h. Amend the Special Use Permit. Any exceedance of the allowable noise level shall require an amendment to the BIG DATA CENTER SPECIAL USE permit. The amendment to the BIG DATA CENTER SPECIAL USE permit shall include any changes to BIG DATA CENTER operation that are necessary to comply with the allowable noise level. An application for any required amendment to the BIG DATA CENTER SPECIAL USE permit shall be received (with full application fees) within 180 days of the County Board approval of the post-construction noise study.
- (5) After construction of the BIG DATA CENTER, the Zoning Administrator shall take appropriate enforcement action as necessary to investigate noise complaints in order to determine the validity of the complaints and take any additional enforcement action as warranted to stop any violation that is occurring, including but not limited to the following:
 - a. The Zoning Administrator shall make the Environment and Land Use Committee aware of complaints about noise that have been received by the Complaint Hotline.
 - b. If the Environment and Land Use Committee determines that the noise is excessive, the Environment and Land Use Committee and/or the County Board shall require the Owner or Operator to take reasonable steps to investigate and mitigate the excessive noise including a noise verification study.
 - (a) The County Board reserves the right to hire a noise consultant to determine if the noise produced by the BIG DATA CENTER is consistent with the Illinois Pollution Control Board (IPCB) regulations (35 Illinois Administrative Code Subtitle H: Noise Parts 900, 901, 910).
 - (b) In the event that a violation of the IPCB noise regulations is identified the Zoning Administrator may require the BIG DATA CENTER owner to take whatever actions are necessary to stop the violation and comply with the noise regulations. The Zoning Administrator may seek direction from the Environment and Land Use Committee regarding the actions necessary to stop the violation.

(c) In the event that a violation of IPCB noise regulations is identified the BIG DATA CENTER owner shall reimburse to the County the cost of the noise consultant.

I. Standard Conditions for Endangered Species Consultation

The Applicant shall apply for consultation with the Endangered Species Program of the Illinois Department of Natural Resources. The Application shall include a copy of the Agency Action Report from the Endangered Species Program of the Illinois Department of Natural Resources or, if applicable, a copy of the Detailed Action Plan Report submitted to the Endangered Species Program of the Illinois Department of Natural Resources and a copy of the response from the Illinois Department of Natural Resources.

J. Standard Conditions for Historic and Archaeological Resources Review

The Applicant shall apply for consultation with the State Historic Preservation Officer of the Illinois Department of Natural Resources. The Application shall include a copy of the Agency Action Report for the State Historic Preservation Officer of the Illinois Department of Natural Resources.

K. Standard Conditions for Acceptable Wildlife Impacts

The BIG DATA CENTER shall be located, designed, constructed, and operated so as to avoid and if necessary mitigate the impacts to wildlife to a sustainable level of mortality.

L. Screening and Fencing

(1) Perimeter fencing

- a. BIG DATA CENTER equipment and structures shall be fully enclosed and secured by a fence with a minimum height of 7 feet.
- b. Knox boxes and keys shall be provided at locked entrances for emergency personnel access.
- c. Vegetation between the fencing and the LOT LINE shall be maintained such that NOXIOUS WEEDS are controlled or eradicated consistent with the Illinois Noxious Weed Law (505 ILCS 100/1 et. seq.). Management of the vegetation shall be explained in the application.

(2) Screening

- a. A visual screen shall be provided around the perimeter of the BIG DATA CENTER as follows:
 - (a) The visual screen shall be provided for any part of the BIG DATA CENTER that is visible to and located within 1,000 feet of an existing DWELLING or residential DISTRICT except that the visual screen may not be required within the full 1,000 feet of an existing DWELLING or residential DISTRICT provided the Applicant submits a landscape plan prepared by an Illinois Registered Landscape Architect and the BOARD finds that the visual screen in the landscape plan provides adequate screening. However, the visual screen shall not be required if the BIG DATA CENTER is not visible to a DWELLING or residential DISTRICT by virtue of the existing topography.
 - (b) The visual screen shall be waived if the owner(s) of a relevant DWELLING(S) have agreed in writing to waive the screening requirement and a copy of the written waiver is submitted to the BOARD or GOVERNING BODY.
 - (c) The visual screen shall be a vegetated buffer as follows:
 - i. A vegetated visual screen buffer that shall include a continuous line of native evergreen foliage and/or native shrubs and/or native trees and/or any existing wooded area and/or plantings of tall native greases and other native flowering plants and/or an area of agricultural crop production that will conceal the BIG DATA CENTER from view from adjacent abutting property may be authorized as an alternative visual screen subject to specific conditions.
 - ii. Any vegetation that is part of the approved visual screen buffer shall be maintained in perpetuity of the BIG DATA CENTER. If the evergreen foliage below a height of 7

feet disappears over time, the screening shall be replaced.

- iii. The continuous line of native evergreen foliage and/or native shrubs and/or native trees shall be planted at a minimum height of 5 feet tall and shall be planted in multiple rows as required to provide a 50% screen within 2 years of planting. The planting shall otherwise conform to Natural Resources Conservation Service Practice Standard 380 Windbreak/Shelterbreak Establishment except that the planting shall be located as close as possible to the BIG DATA CENTER fence while still providing adequate clearance for maintenance.
- iv. A planting of tall native grasses and other native flowering plants may be used as a visual screen buffer for any BIG DATA CENTER installation that is no more than 8 feet tall provided that the width of planting shall be authorized by the BOARD and the planting shall otherwise be planted and maintained per the recommendations of the Natural Resources Conservation Service Practice Standard 327 Conservation Cover and further provided that the BIG DATA CENTER perimeter fence is opaque.
- v. An area of agricultural crop production may also be authorized by the BOARD as an alternative visual screen buffer with a width of planting as authorized by the BOARD provided that the BIG DATA CENTER perimeter fence is opaque. Any area of crop production that is used as a vegetated visual screen shall be planted annually and shall be replanted as necessary to ensure a crop every year regardless of weather or market conditions.
- vi. Any vegetated screen buffer shall be detailed in a landscape plan drawing that shall be included with the BIG DATA

CENTER County Board SPECIAL USE
Permit application.

M. Standard Condition for Liability Insurance

- (1) The Owner or Operator of the BIG DATA CENTER shall maintain a current general liability policy covering bodily injury and property damage with minimum limits of at least \$5 million per occurrence and \$5 million in the aggregate.
- (2) The general liability policy shall identify landowners in the SPECIAL USE Permit as additional insured.

N. Standard Condition for Water Use and Cooling

- (1) The use of ground water and/or use of water from a PUBLIC WATER SUPPLY SYSTEM for cooling the processors, other equipment, and the buildings in the BIG DATA CENTER shall be limited to closed-loop cooling systems. No evaporative chillers shall be allowed.
- (2) Maximum water usage effectiveness. Water usage effectiveness is the ratio of total potable building water consumption (in liters) to Information Technology equipment energy use (in kilowatt-hours). The maximum water usage effectiveness is 0.2.
- (3) Any water well capable of withdrawing water at or above 70 gallons per minute (gpm) must comply with all requirements (including annual reporting requirements) of the Water Use Act of 1983 (525 ILCS 45).
- (4) The SPECIAL USE Permit application shall include the following:
 - a. A description of the proposed cooling system for the processors, other equipment, and the buildings in the BIG DATA CENTER.
 - b. An estimate of the Total Direct Water Usage for cooling the processors, other equipment, the buildings, humidification, fire suppression, and occupant demand in the BIG DATA CENTER. The estimate shall identify the proposed source of water and include the amounts of ground water and/or water from a PUBLIC WATER SUPPLY SYSTEM to be used for cooling the processors, other equipment, the buildings, humidification, fire suppression, and occupant demand. The estimate shall include estimated average

- daily water demand (gallons per day); estimated peak daily water demand; estimated annual water consumption; and expected seasonal variability in water use.
- c. A water withdrawal plan detailing proposed ground water withdrawals and use.
 - d. A written explanation by an Illinois Professional Engineer of how the use of ground water and/or the use of water from a PUBLIC WATER SUPPLY SYSTEM for cooling the processors, other equipment and the buildings in the BIG DATA CENTER shall be minimized as much as possible.
 - e. An explanation of any chemical additives proposed to be added to the cooling water and how water used for cooling will be disposed of and how often it will be disposed of and how disposal of coolant water will be consistent with National Pollutant Discharge Elimination System (NPDES) standards and requirements. The source of any make-up water for the cooling system shall also be explained.
 - f. The BOARD may request copies of well records from the Illinois State Water Survey and may require an estimate by a qualified hydrogeologist of the likely impact on adjacent water wells.
- (5) After the BIG DATA CENTER begins operation, an annual report on water usage shall be submitted to the Environment and Land Use Committee.
- a. The report shall explain the amount of Total Direct Water Use for cooling the processors, other equipment, the buildings, humidification, fire suppression, and occupant demand by month and for the year.
 - b. The report shall include the average daily water demand (gallons per day); the peak daily water demand; the annual water consumption; and observed seasonal variability in water use.
 - c. The report shall include documentation that the water usage effectiveness is no more than 0.2.
 - d. The report shall also document any changes to the water for the closed-loop cooling system and document compliance of those changes with water-quality requirements.

- e. Any reporting required for compliance with the Water Use Act of 1983 (525 ILCS 45).

O. Standard Conditions for Energy Use and Impact on the Electrical Grid

(1) Energy efficient buildings.

- a. All BIG DATA CENTER buildings shall comply with the most recent or previous International Energy Conservation Code.
- b. Compliance with this requirement shall be certified in writing by an Illinois Licensed Architect to be submitted prior to the issuance of a Zoning Use PERMIT.

(2) On-site Renewable Energy and Resilience requirements. A BIG DATA CENTER shall install and operate one of the following:

- a. On-site Clean Energy. On-site renewable energy generation with a nameplate capacity sufficient to supply not less than {25% or 50%} of the facility's peak electrical demand as demonstrated in the approved electrical load study; or
- b. On-site Resilience Storage. On-site energy storage capable of supplying not less than 50% of the BIG DATA CENTER's peak electrical demand for a minimum duration of 15 minutes for purposes of including electrical grid stabilization, brownout mitigation, and peak-load support. Energy storage systems shall be configured to prioritize discharge during utility-declared peak events and grid emergencies to reduce localized voltage sag, transformer overload, and outage risk in the surrounding region.

(3) Modular nuclear reactors, small modular reactors, or any other nuclear-based on-site energy production methods are prohibited.

(4) The SPECIAL USE Permit application shall include a written explanation of the anticipated impacts that the proposed BIG DATA CENTER may have on electric power grid reliability and electricity pricing as follows:

- a. The report shall be written by a third-party consultant with at least 20-years of experience in power grid management,

energy project development, commodity procurement, and utility regulation.

b. The report shall address the following:

- (a) Whether the local service network can accommodate the increased load arising from the BIG DATA CENTER.
- (b) Whether in the event of a grid blackout retail customers will be prioritized for service by the local utility instead of the BIG DATA CENTER.
- (c) Whether the regional power transmission grid may be overstrained by operation of the BIG DATA CENTER.
- (d) Whether there is enough power generating capacity in the region to serve the BIG DATA CENTER.
- (e) Whether existing power grid users will be forced to pay any interconnection costs related to the BIG DATA CENTER.
- (f) Whether power delivery rates for existing utility customers will likely increase because of the BIG DATA CENTER.
- (g) Whether increased demand for electricity caused by the BIG DATA CENTER will likely increase regional costs in central Illinois.

P. Operational Standard Conditions

(1) Maintenance

- a. The Owner or Operator of the BIG DATA CENTER must submit, on an annual basis, a summary of operation and maintenance reports to the Environment and Land Use Committee and any other operation and maintenance reports as the Environment and Land Use Committee reasonably requests.
- b. Any physical modification to the BIG DATA CENTER that increases the number of solar conversion devices or structures and/or the land area occupied by the BIG DATA

CENTER shall require a new County BOARD SPECIAL USE Permit. Like-kind replacements shall not require recertification nor will replacement of transformers, cabling, etc. provided replacement is done in fashion similar to the original installation.

(2) Materials Handling, Storage and Disposal

- a. All solid wastes related to the construction, operation and maintenance of the BIG DATA CENTER shall be removed from the site promptly and disposed of in accordance with all Federal, State and local laws.
- b. All hazardous materials related to the construction, operation and maintenance of the BIG DATA CENTER shall be handled, stored, transported and disposed of in accordance with all applicable local, State and Federal laws.

(3) Vegetation management

- a. The BIG DATA CENTER SPECIAL USE Permit application shall include a weed control plan for the total area of the SPECIAL USE Permit including areas both inside of and outside of the perimeter fencing.
- b. The weed control plan shall ensure the control and/or eradication of NOXIOUS WEEDS consistent with the Illinois Noxious Weed Law (55 ILCS 100/1 et. seq.).
- c. The weed control plan shall be explained in the application.

Q. Complaint Hotline

- (1) Prior to the commencement of construction on the PV SOLAR FARM and during the entire term of the COUNTY Board SPECIAL USE Permit and any extension, the Applicant and Owner shall establish a telephone number and email hotline for the general public to call or contact with any complaints or questions.
- (2) The telephone number hotline shall be publicized and posted at the operations and maintenance center and the construction marshalling yard. The hotline signs shall also include the Department of Planning and Zoning phone number and email address for complaints.

- (3) The telephone number hotline shall be manned during usual business hours and shall be an answering recording service during other hours.
- (4) Each complaint call to the telephone number hotline shall be logged and identify the name and address of the caller and the reason for the call.
- (5) All calls shall be recorded and the recordings shall be saved for transcription for a minimum of two years.
- (6) A copy of the telephone number hotline log shall be provided to the Zoning Administrator on a monthly basis.
- (7) The Owner shall take necessary actions to resolve all legitimate complaints in a timely manner.

QR. Standard Conditions for Expiration of BIG DATA CENTER COUNTY Board SPECIAL USE Permit

A BIG DATA CENTER COUNTY Board SPECIAL USE Permit designation shall expire in 10 years if no Zoning Use Permit is granted.

RS. Application Requirements

- (1) In addition to all other information required on the SPECIAL USE Permit application and required by Section 9.1.11A.2., the application shall contain or be accompanied by the following information:
 - a. A BIG DATA CENTER Project Summary, including, to the extent available:
 - (a) A general description of the project, including its approximate AC generating capacity; the maximum number and type of processors, and the potential equipment manufacturer(s).
 - (b) The specific proposed location of the BIG DATA CENTER including all tax parcels on which the BIG DATA CENTER will be constructed.
 - (c) The specific proposed location of all tax parcels required to be included in the BIG DATA CENTER COUNTY Board SPECIAL USE Permit.

- (d) A description of the Applicant, Owner and Operator, including their respective business structures.
 - (e) The proposed phases of construction and/or planned expansion of capacity towards the ultimate capacity as authorized in the SPECIAL USE Permit.
- b. The name(s), address(es), and phone number(s) of the Applicant(s), Owner and Operator, and all property owner(s) for the BIG DATA CENTER COUNTY Board SPECIAL USE Permit.
- a. A site plan for the BIG DATA CENTER indicating the following:
 - (a) The approximate planned location of all BIG DATA CENTER STRUCTURES, property lines (including identification of adjoining properties), required separations, public access roads and turnout locations, access driveways, solar devices, electrical inverter(s), electrical transformer(s), cabling, switching station, electrical cabling from the BIG DATA CENTER to the Substation(s), ancillary equipment, screening and fencing, third party transmission lines, meteorological station, maintenance and management facilities, and layout of all structures within the geographical boundaries of any applicable setback.
 - (b) The site plan shall clearly indicate the area of the proposed BIG DATA CENTER COUNTY Board SPECIAL USE Permit as required by subparagraph 6.1.5A.(1).
 - (c) The location of all below-ground wiring.
 - (d) The location, height, and appearance of all above-ground wiring and wiring structures.
 - (e) The separation of all BIG DATA CENTER structures from adjacent DWELLINGS and/or PRINCIPAL BUILDINGS or uses shall be dimensioned on the approved site plan and that dimension shall establish the effective minimum separation that shall be required for any Zoning Use Permit. Greater separation and somewhat different

locations may be provided in the approved site plan for the Zoning Use Permit provided that the greater separation does not increase the noise impacts and/or glare that were approved in the BIG DATA CENTER COUNTY Board SPECIAL USE Permit. BIG DATA CENTER structures include substations, third party transmission lines, maintenance and management facilities, or other significant structures.

- d. All other required studies, reports, certifications, and approvals demonstrating compliance with the provisions of this Ordinance.
 - e. The BIG DATA CENTER SPECIAL USE Permit application shall include documentation that the applicant has provided a complete copy of the SPECIAL USE Permit application to any municipality within one-and-one-half miles of the proposed BIG DATA CENTER as required by Section 6.1.5B.(2)a.(b).
 - f. A municipal resolution regarding the BIG DATA CENTER by any municipality located within one-and-one-half miles of the BIG DATA CENTER must be submitted to the Zoning Administrator prior to the consideration of the BIG DATA CENTER SPECIAL USE Permit by the Champaign COUNTY Board or, in the absence of such a resolution, the Zoning Administrator shall provide documentation to the COUNTY Board that any municipality within one-and-one-half miles of the BIG DATA CENTER was provided notice of the meeting dates for consideration of the proposed BIG DATA CENTER FARM SPECIAL USE Permit for both the Environment and Land Use Committee and the COUNTY Board as required by Section 6.1.5B.(2)a.(c).
 - g. Documentation of an executed interconnection agreement with the appropriate electric utility shall be provided prior to issuance of a Zoning Compliance Certificate to authorize operation of the BIG DATA CENTER as required by Section 6.1.5B.(3)b.
- (2) The Applicant shall notify the COUNTY of any changes to the information provided above that occurs while the COUNTY Board SPECIAL USE Permit application is pending.

5. Add the following new Zoning Use Permit fees to Section 9.3.1:

- L. BIG DATA CENTER....same fee per megawatt as a PV SOLAR FARM Zoning Use permit but also include an initial payment of \$60,000 per phase for the cost of a Post-construction BIG DATA CENTER Noise Study and \$60,000 per phase for the cost of a Post-construction BIG DATA CENTER Vibration Study for each proposed phase of the BIG DATA CENTER and plus any additional fees for the amount by which the costs billed to the COUNTY exceed the initial payment, or a refund of any unspent fee, due upon approval of the Noise Study and the Vibration Study.

6. Add the following new Special Use Permit fees to Section 9.3.3B.:

- (10) BIG DATA CENTER....same fee per megawatt as a PV SOLAR FARM SPECIAL USE Permit

Compendium of WHO and other UN guidance on health and environment

2022 update



Chapter 11. Environmental noise



WHO/HEP/ECH/EHD/22.01

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11. Environmental noise

This section addresses exposure of the general population to environmental noise, such as noise from various forms of traffic or industry. It includes amplified music in the framework of leisure activities as well. It does not specifically include occupational noise exposure. Occupational risks, including noise exposure, are covered in section [11.3 on workplaces](#).



Overview

In 2011, an estimated one million healthy life years were lost from traffic-related noise in the western part of Europe only (1). Important sources for environmental noise exposure are road, railway and air traffic, or building sites. Noise exposure can also occur through other sources such as wind turbines, and leisure activities such as listening to loud music or other audio content including participation in e-sports (video and computer game competitions). Excessive noise can cause annoyance; in addition research shows it increases the risk for IHD and hypertension, sleep disturbance, hearing impairment, tinnitus and cognitive impairment, with increasing evidence for other health impacts such as adverse birth outcomes and mental health problems (2).

What is the proportion of people impacted by environmental noise in my country?

The noise indicators below are taken from guidelines that were developed for the WHO European Region. In terms of their health implications, the recommended exposure levels can be considered applicable in other regions and suitable for a global audience (2).

Noise indicators are based on the European Union Directive 2002/49/EC (3) in the European Region.

- L_{den} is an average sound pressure level over all days, evenings and nights in a year.
- L_{night} is the equivalent continuous sound pressure level when the reference time interval is the night.
- $L_{Aeq,T}$ is the A-weighted (a frequency weighting to better reflect the human ear), equivalent continuous sound pressure level during a stated time interval starting at t_1 and ending at t_2 , expressed in decibels (dB), at a given point in space.

The first two indicators are used particularly for noise monitoring and exposure assessment. The third is used for measuring leisure noise exposure. For more information on these and other noise indicators consult the *Environmental noise guidelines for the European Region* (2). These noise indicators can be converted to other indicators used in other settings (4).

What is the proportion of people impacted by environmental noise in my country?

Several countries use surveys to assess the perception of noise in the general population. The last European Quality of Life survey, carried out 2016–2017, found that 32% of more than 30 000 participants across Europe reported problems with noise in the immediate neighbourhood of their home (5).

What are the levels of noise exposure we want to achieve?

Based on the systematic review of evidence available at the time of the development of the environmental noise guidelines (2), the following recommended levels for specific noise sources can be defined.

For average noise exposure, the following sound pressure levels are recommended (2, 6):

- $< 53 \text{ dB } L_{\text{den}}$ for road traffic noise
- $< 54 \text{ dB } L_{\text{den}}$ for railway noise
- $< 45 \text{ dB } L_{\text{den}}$ for aircraft noise
- $< 45 \text{ dB } L_{\text{den}}$ for wind turbine noise
- yearly average from all leisure source noises combined to $\leq 70 \text{ dB } L_{\text{Aeq, 24h}}$
- weekly average from leisure sources (such as personal listening devices ¹) $\leq 80 \text{ dB(A)}$ or $1.6 \text{ Pa}^2\text{h}$
- short-term average from occasional exposure to leisure source noise $\leq 100 \text{ dB } L_{\text{Aeq, 15min}}$

For **night noise exposure**, the following sound pressure levels are recommended (2):

- $< 45 \text{ dB } L_{\text{night}}$ for road traffic noise
- $< 44 \text{ dB } L_{\text{night}}$ for railway noise
- $< 40 \text{ dB } L_{\text{night}}$ for aircraft noise.

Different categories of noise mitigation interventions along a continuum from source reduction to behaviour change can be defined. Interventions in the guidance section below are marked with A–E as defined hereafter (2).

- A. Source intervention:
 - change in emission levels of sources
 - time restrictions on source operators.
- B. Path intervention:
 - change in the path between source and receiver
 - path control through insulation of receiver/receiver's dwelling
- C. New/closed infrastructure:
 - opening of a new infrastructure noise source
 - closure of an existing one
 - planning controls between (new) receivers and sources.
- D. Other physical intervention:
 - change in other physical dimensions of dwelling/neighbourhood.
- E. Behaviour change intervention:
 - change in individual behaviour to reduce exposure
 - avoidance of exposure or reduced duration of exposure
 - community education and communication.

¹ A personal listening or audio device is a portable device designed to be worn on the body or in a pocket. It is designed to allow the user to listen to various forms of media.

 Guidance	 Sector principally involved in planning/implementation	 Level of implementation	 Instruments
Road traffic noise: policies and actions			
Recommended actions are available for specific noise sources and do not cover all potentially important noise exposures.			
1. Improve the choice of appropriate tyres and road surface (A) (2).	 Transport  Land use planning	National; community	Regulation; infrastructure, technology and built environment
2. Reduce traffic flow and restrict truck traffic (A) (2).	 Transport  Land use planning	National; community	Regulation; taxes and subsidies; infrastructure, technology and built environment
3. Insulate dwellings, construct barriers (B) (2).	 Housing  Land use planning	National; community	Regulation; taxes and subsidies; infrastructure, technology and built environment
4. Construct road tunnels (C) (2).	 Transport  Land use planning	National; community	Infrastructure, technology and built environment
5. Design/make available a "quiet side" in the dwelling; create nearby green space (D) (2).	 Housing  Land use planning	National; community	Infrastructure, technology and built environment
Railway noise: policies and actions			
6. Apply rail grinding procedures to remove deformations and corruptions on railway tracks (A) (2).	 Transport	National; community	Infrastructure, technology and built environment
Railway noise: awareness raising and capacity building			
7. Inform the community about interventions being implemented to potentially reduce noise annoyance (E) (2).	 Health  Environment  Transport	Community Universal health coverage	Information, education and communication
Aircraft noise: policies and action			
8. Adapt opening and closing of runways (C) (2).	 Transport	National; community	Regulation; other management and control

 Guidance	 Sector principally involved in planning/implementation	 Level of implementation	 Instruments
9. Rearrange flight paths (C) (2).	 Transport	National; community	Regulation; other management and control
Leisure noise: policies and actions			
10. Implement sound exposure monitoring (volume level and time spent listening) in all personal listening devices to allow for self-control with reference to a standard. In every listening device, the user should be allowed to select two different operational modes of reference exposure (6), and track the percentage of exposure used vs the reference exposure for every seven days. The two operational modes include the following. - Mode 1: WHO standard level for adults - Mode 2: WHO standard level for sensitive users (e.g. children).	 Health  Sports and leisure	National	Regulation; infrastructure, technology and built environment
11. Implement options for volume limitation and parental volume control in every device (6).	 Sports and leisure	National	Regulation; infrastructure, technology and built environment
12. Enact and enforce legislation/regulations/policies for limiting sound levels and exposure in entertainment venues and events such as clubs, bars, fitness centres, concerts, etc.(3, 7). Legislation should focus on: - limiting sounds to 100 dB(A) averaged over 15 minutes; - conducting regular sound monitoring to ensure and document compliance; - optimizing venue acoustics and sound system design to ascertain optimal listening conditions for all audience members in the venue/event; - create quiet zones allowing audience members to rest; - ensuring provision of hearing protection (earplugs); - ensuring provision of training on noise reduction strategies and information about noise.	 Sports and leisure	National	Regulation
Leisure noise: awareness raising and capacity building			
13. Provide information on personal sound exposure to the user of personal listening devices through the device interface or other means (6).	 Health  Sports and leisure	National	Information, education and communication
14. Provide personalized recommendations and cues for action for safe listening through personal listening devices, customized to a user's listening profile through the device interface or other means (6).	 Health  Sports and leisure	National	Information, education and communication
15. Provide instructions on how to use safe listening features on the specific device through the device interface or other means (6).	 Health  Sports and leisure	National	Information, education and communication

 Guidance	 Sector principally involved in planning/implementation	 Level of implementation	 Instruments
16. Provide general information on safe listening and ways to practise it through the device interface or other means (6).	 Health  Sports and leisure	National	Information, education and communication

Selected tools

WHO 2021: WHO is developing a global standard for safe listening entertainment venues (7)

This guidance will promote safe listening among attendees of entertainment venues to mitigate their risk of hearing loss.

WHO Regional Office for Europe 2018: *Environmental noise guidelines for the European Region* (2)

Results of the noise guidelines are also available as an executive summary in different languages.

WHO/ITU 2019: *Safe listening devices and systems – a WHO-ITU standard* (6)

This document outlines the key features and requirements that personal audio systems must have in order to facilitate safe listening practices among users.

WHO 2015: *Make listening safe* (8)

This webpage provides access to advocacy material around safe listening such as infographic, poster, banner and brochure.

WHO/ITU 2019: *Toolkit for safe listening devices and systems* (9)

This toolkit provides practical guidance to support countries, industry partners and civil society groups in the use and implementation of the global standard on safe listening devices and systems (ITU-T H.870) (10).

WHO Regional Office for Europe 2012: *Methodological guidance for estimating the burden of disease from environmental noise* (11)

WHO Regional Office for Europe 2011: *Burden of disease from environmental noise. Quantification of healthy life years lost in Europe* (1)

WHO Regional Office for Europe 2009: *Night noise guidelines for Europe* (12)

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June 20, 2022

Ben Mallernee
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Brookfield Renewable
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Re: Review of Proposed Noise-Related Changes to the Champaign County Wind Turbine Ordinance

Mr. Mallernee,

Per your request, I reviewed the proposed noise-related changes to the Champaign County Zoning Ordinance. A summary of the most important issues is provided below. Additional information follows which provides a more in-depth review of the issues involved.

The Champaign County Zoning Board of Appeals (ZBA) gathered public input and provided recommendations limiting noise levels to 39 dBA (audible) and 80 dB (infrasound) at the property line to "better protect Champaign County residents." Audible noise levels have been and continue to be safely regulated by the rules of the Illinois Pollution Control Board (IPCB). The IPCB rules limit noise from wind projects to approximately 46 dBA¹, which is in line with recommendations from the World Health Organization (WHO), other health-based studies, and on the low end of the range of limits used by virtually all states and counties in the U.S. The proposed limit of 39 dBA is based on the opinion of a handful of consultants who have only *theorized* that such a limit is necessary. These theories have not been borne out in reality with over 3,000 turbines safely operating in Illinois and 70,000 nationwide. Understand that this low limit completely prohibits the development of wind turbines in the Midwest and is lower than existing ambient noise levels due to the wind blowing through trees.

The ZBA also raised concerns of infrasound (very low frequency sound). For decades it has been *postulated* and *theorized* by a handful of mostly non-medical individuals that infrasound from wind turbines *might* be harmful to human health. This has been disproven by numerous studies conducted by government health-based agencies the world over. It has been tested and verified that infrasound produced by wind turbines is not audible to humans in any way, shape, or form. The proposed limit of 80 dB is unnecessary and provides no demonstrated benefit to the public.

The ZBA also recommended that the 39 dBA and 80 dB limits be enforced at the edge of a property, not at the residence itself. This is unnecessary and inappropriate. The IPCB rules are comprehensive in their protection from noise impacts through the distinction of limits based on land use, with more stringent limits in place for noise emitted to a residence and more stringent limits yet for nighttime versus daytime. This is appropriate given that nighttime activities, such as sleeping, require a greater degree of protection. Developers of wind turbine projects understand this and design projects to meet the residential, nighttime noise limits at every residence.



Additional Information Regarding the Adequacy of the IPCB Noise Limits

The IPCB noise level limits are some of the most comprehensive and restrictive limits in the country. They have safely governed all forms of noise sources in the state, including the thousands of wind turbines that have been operating for 20 years. The noise limits take into account residential land use, nighttime activities (e.g., sleeping), and frequency content in that they limit low frequency noise as well as more typical “audible noise.” The information the ZBA heard to the contrary was provided by a handful of non-medical consultants and their opinions stand in stark contrast to what medical experts and agencies have published. Specifically:

1. The IPCB limits noise using a different metric than other states, counties, and townships in the U.S. The IPCB specifies limits to individual frequency bands (dB), whereas almost all other regulations and standards utilize what is called the overall A-weighted level (dBA). Based on the frequency spectra of wind turbine noise, the IPCB effectively limits noise from wind turbines to 46 dBA.
2. The World Health Organization has long recommended a limit of 45 dBA for the protection of human health at night^{2,3,4}. In 2018 the WHO studied noise from wind turbines specifically. They found no evidence for health impacts, some evidence for annoyance, and recommend a limit of 45 dBA. Note that this limit is expressed as the annual average of the 24-hour average day-evening-night level, which equates to a loudest-hour turbine noise level of 45 dBA. The IPCB limit is in line with these recommendations.
3. First published in 2016, the Health Canada⁵ study is, to date, the most rigorous study of the potential effects of noise from wind turbines on human health. It studied 1,200 people living near wind farms in Canada and collected both subjective (surveys) and objective (e.g., cortisol levels and sleep parameters) data from participants. It concluded that, up to 46 dBA (the loudest level they studied), they too found no evidence of health impacts and some evidence of annoyance. Again, the IPCB limits are in line with these findings.
4. At a state-level in the U.S. the range of limits is 45 to 55 dBA, including Wisconsin (45 dBA), Colorado (50 dBA), Illinois (46 dBA), Minnesota utility commission (47 to 50 dBA), New York utility commission (45 dBA), South Dakota utility commission (45 dBA), and Maryland (55 dBA). The IPCB limits are on the low end of this range and therefore very much in line with what is being done nationally.
5. Hankard Environmental has conducted approximately 50 noise impact analyses for projects regulated at the county or township level in the U.S. In our experience, the limits at the local level overwhelmingly range from 45 to 55 dBA. There are some localities with higher limits, but this is moot as wind turbines do not produce noise levels in excess of approximately 50 dBA at residences based on our measurement of noise at more than 60 locations. Where limits of less than 40 dBA have been enacted, this too is moot, as no utility-scale wind development can or has been developed in the Midwest. The IPCB limits are on the very low end of this range.

Despite this conclusive information, opponents of wind energy projects have routinely asserted that the IPCB noise limits are not sufficient to protect public health and well-being. The following lists examples of the rationale for lower limits that has been presented by a few consultants who are not medical experts. The examples have a common thread, in that they consist of *theories* associated with decades-old studies, many of which are unrelated to wind turbines. These theories have remained the same for 10 to 20 years now, all the while ignoring the results of the health-based studies noted above. With over 70,000 wind turbines now operating in the U.S. it is becoming clearer that these theories have not, and are not coming to pass.

- ANSI S12.9 Parts 4 and 5^{6,7} can be used to establish limits for certain land uses, such as residential. The standard will yield limits in the 30 to 35 dBA range if each adjustment in the standard is taken to its fullest. For example, the standard's starting point of 55 dBA can be lowered by 10 dBA for "quiet rural areas." Wind turbine projects are indeed sited in rural areas, but they produce full acoustic emissions only when it is windy which is when it is not quiet, and turbines are off during calm, quiet nights. The ANSI limit can be lowered by another 5 dBA for sources of noise that are new to a community. Wind turbines may be new in some cases, but their sound is similar to a fan or plane. Only by taking the full adjustment in both of these cases, which is an overreaching theory, does one arrive at a recommendation of 39 dBA. A more balanced interpretation of the ANSI guidelines leads to a limit of 45 dBA, which as noted above is that used by many counties and states.
- It has long been established in the acoustics profession that the impact of noise from a new source is dependent on how loud it is relative to existing noise levels. If the source is 10 dBA or more louder than existing levels it is generally considered potentially intrusive. On calm, quiet rural nights it can be very quiet (down to 20 dBA). But these are the very nights wind turbines are *off* and nearly silent. Turbines generate their maximum noise on windy nights, those nights where it is noisy due to the rustling of trees and crops. Wind blowing through trees generally produces noise levels ranging from 35 to 55 dBA. For a project permitted at 45 dBA, it could at times be 10 dBA louder than existing levels and at times be 10 dBA quieter (in other words not audible). Comparing wind turbine noise levels of 45 dBA to ambient levels of, for example 20 dBA, is misleading and inaccurate.
- In 2018 the WHO published a conditional recommendation of 45 dBA. This limit is specified using a metric called the annual-average day-evening-night level (" L_{den} " or "DNL," dBA). Consultants for wind turbine opponents have falsely asserted that wind turbine noise levels need to be limited to 35 dBA at night to meet this recommendation. They arrive at this conclusion through the 10 dBA "penalty" applied to nighttime noise levels in the calculation of the L_{den} , falsely assuming that turbines produce full acoustic emissions 24 hours a day, 365 days a year. Turbines operate fully only about 30% of the time, and not all of that occurs at night. Furthermore, there are many days and nights in a year when the turbines do not operate at all, or when atmospheric conditions do not favor noise propagation. When all of this is taken into account, limiting noise levels to 45 dBA (one-hour average of full operation) will meet the WHO 2018 conditional recommendation of an annual average L_{den} of 45 dBA⁸.
- Relying on data published by the U.S. EPA in 1974, coupled with research published in Europe in 2008, and with a few adjustments of their own, a few acoustical consultants have testified that wind projects permitted with a maximum level of 45 dBA will result in "strong appeals to stop noise" and "vigorous community reaction." It is agreed that there have been

complaints about noise from wind turbine projects, and in some cases legal action. The same can be said about noise from many industrial facilities, airports, roadways, rail lines, and agricultural operations. Wind turbines are not unique in this regard. However, instead of reviewing and combining decades-old research on non-turbine sources with decade-old studies of turbine noise in Europe, it is preferable, and more realistic, to review a study conducted recently in the U.S. dealing directly with turbine noise and its annoyance⁹. This study of attitudes of people living near wind turbine projects throughout the U.S. shows that, when asked, ~25% of the respondents living with noise levels of up to 45 dBA reported being “highly annoyed.” But it needs to be noted that only 25% of those living close to the turbines even responded to the survey. This is a very low response rate and indicative of a lack of concern. Thus, only ~6% of the population living very near the turbines could be considered highly annoyed based on this study (25% of 25%). In the field of environmental acoustics, a value of “10% highly annoyed” has long been used as a maximum value when designing power generation and other industrial facilities. The Haac study acknowledges that there is a degree of annoyance associated with wind turbine projects, but the level of annoyance is within expected bounds.

Additional Information Regarding Infrasound

The ZBA recommends a limit on infrasound from wind turbines of 80 dB. It is imperative to understand that humans routinely experience infrasound, it is produced by sources such as the wind, ocean waves, and home heating systems. When riding in a car, tractor, or plane a person experiences far higher levels of infrasound than those produced by wind turbines. However, none of these sources, nor wind turbines, produce enough infrasound for humans to detect, either through our ears or through other means such as vibration. In fact, the levels of infrasound produced by wind turbines are *significantly* below the threshold of hearing in humans at these very low frequencies. As detailed below, studies by numerous health-based organizations have repeatedly demonstrated that infrasound from wind turbines is not harmful to humans. Therefore, no limit is needed or warranted.

Infrasound from wind turbines has been measured at and inside homes by researchers in the U.S. and internationally, most notably by the Federal State of Baden-Wuerttemberg in Germany, Walker, et al. in the U.S., and Tachibana in Japan. Small peaks of acoustic energy are produced from about 1 Hz to 5 Hz and are the result of the blades passing the tower, but the levels are 50 dB below the threshold of human hearing.

In 2022, Liebich, et al.¹⁰ produced the largest polysomnography study of the potential interaction between wind-turbines noise (WTN) and sleep. Their controlled, repeated-measures, laboratory study of 68 adults was conducted in a pin-drop quiet laboratory of 19 dBA background noise, with wind turbine noise exposures of 25 dBA in four different exposure conditions over four nights. The study did not demonstrate differences in participants’ primary outcome of sleep efficiency. The importance of their study is that the wind turbine noise level was substantially higher than the background noise, and yet their primary outcome of sleep efficiency was undisturbed.

In 2021 Maijala, et al.¹¹ published the results of a study in the Journal of the Acoustical Society of America involving people who had complained of health impacts from wind turbines. Samples of turbine noise, including infrasound, were played in a test chamber for these people while certain tasks were performed and physical symptoms monitored. A control group who had not complained about turbines was also included. The concluding statement reads: “In the conditions used in the current study, infrasound did not contribute to the detection, annoyance, or physiological reactions to wind turbine sound.” In other words, nobody, not even those who had complained of health impacts, could tell that infrasound was even there.

Wind energy opponents have for at least a decade theorized that perhaps there is something about infrasound that makes it different from other sources such that it could impact humans more directly or via a pathway not fully understood. In contrast to these theories, the following is a sample of what leading researchers and governments across the world have concluded based on their research into wind turbine infrasound impact to humans:

Japan Ministry of the Environment study¹²: “Super-low frequency range components of wind turbine noise [20 Hz or lower] are at imperceptible levels. **Therefore, wind turbine noise is not an issue caused by super-low frequency range.**”

French Government (ANSES) measurement study¹³ at three wind farms concluded: “The results of these campaigns confirm that wind turbines are sources of infrasound and low sound frequencies, but no exceedance of the audibility thresholds in the areas of infrasound and low frequencies up to 50 Hz has been found.” The study also noted “**all the experimental and epidemiological data available today do not show any health effects related to exposure to noise from wind turbines, other than noise-related annoyance.**”

Health Canada’s 2015 Community Noise and Health Study¹⁴ is the largest-yet epidemiological study conducted to address community health concerns in relation to wind turbines. It concluded the following regarding infrasound: “Within the normal hearing frequency range, sounds have to be at a very low level to be non-audible, and at those levels would not contribute to any type of known hearing dysfunction. For low-frequency signals, including infrasound, activation of the vestibular system is possible if the signal levels are at high intensity. For both normal subjects and even for individuals with certain medical conditions that result in lowered vestibular activation thresholds (e.g., Tullio syndrome, superior canal dehiscence, perilymphatic fistula, or enlarged vestibular aqueduct), wind turbine signals are unlikely to reach the activation threshold. **It is therefore unlikely that wind turbine noise could directly cause any symptoms associated with vestibular dysfunction, such as vertigo, dizziness, vision problems, or nausea.**”

The Australian Medical Association¹⁵ evaluated the health impact relative to wind turbines and released a position statement: “The available Australian and international evidence **does not support the view that the infrasound or low frequency sound generated by wind farms, as they are currently regulated in Australia, causes adverse health effects** on populations residing in their vicinity. The infrasound and low frequency sound generated by modern wind farms in Australia is well below the level where known health effects occur, and there is no accepted physiological mechanism where sub-audible infrasound could cause health effects.”

A 2016 German study¹⁶, which spanned two years and examined six wind turbines by different manufacturers with different sizes and covering a power range from 1.8 to 3.2 MW, concludes that “Infrasound is caused by a large number of different natural and technical sources. It is an everyday part of our environment that can be found everywhere. Wind turbines make no considerable contribution to it. **The infrasound levels generated by them lie clearly below the limits of human perception. There is no scientifically proven evidence of adverse effects in this level range.**”

Conclusion

It is my hope that the information provided in this letter demonstrates that:

1. The current IPCB noise level limits have been and continue to be adequate to protect public health based on the published findings of the most significant studies conducted by government and public agencies.
2. Infrasound from wind turbines has never been demonstrated to be audible by or harmful to humans.
3. The recommended noise limit of 39 dBA is based on the opinions of a few non-medical consultants that have long *theorized* that such a limit is necessary.

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Please let me know if you have any questions regarding the above or would like additional information.

Sincerely,

A handwritten signature in black ink that reads "Michael Hankard". The signature is fluid and cursive, with the first name "Michael" and last name "Hankard" clearly distinguishable.

Michael Hankard
Owner and Principal Acoustical Consultant
Full Member of INCE and ASA