Draft High Impact Land Use Overlay District

Definitions proposed to be added to Section 2.02.

⅓ **Octave Band Analysis:** A frequency spectrum analysis where the unweighted sound levels of all frequencies in a sound sample are split into sections (octave bands) where the upper limit is twice the frequency of the lower limit, and each octave band is further split into three equal sections providing a more detailed analysis of the intensity and frequency composition of a sound.

Air Chiller: a cooling and heat rejection system which utilizes fans to move ambient air over condenser coils to cool the water or refrigerant in a Closed Loop Cooling System.

Battery Energy Storage Systems (BESS): A storage system that collects energy from renewable and non-renewable sources in rechargeable batteries for later use.

Closed Loop Cooling System: Any cooling system that constantly reuses and recycles an initial load of process fluid (water or chemical substance) within its operating components for cooling purposes, which is not directly exposed to the air or other cooling system components during heat rejection; this process fluid still requires periodic discharge and refill.

Cooling Tower: an industrial-scale heat exchanger that removes heat from the cooling process fluid.

> ***Open-Circuit Cooling Tower/Open Loop Cooling System:*** a heat rejection system where the warm process water is sprayed directly onto fill media, where it is then exposed to airflow to utilize evaporative cooling; these systems require frequent discharge and refill, consuming large amounts of water, due to the contamination of the process water during the heat-rejection phase.
>
> ***Closed-Circuit Cooling Tower:*** utilized in some Closed-Loop Cooling Systems; basin water is sprayed over the closed-loop coils to utilize evaporative cooling. Basin water requires periodic discharge and refill.
>
> ***Mechanical Draft:*** Open or Closed Circuit Cooling Towers may use Mechanical Draft, which uses fans to move air through the water to enhance the cooling process by accelerating evaporation and therefore heat transfer.

Computer Room Air Conditioners (CRAC): A type of Room-Level HVAC system utilized in computer server rooms/data centers to remove high-density heat generated by IT equipment; CRACs pull hot air from the entire room, and return cool air to the entire room, rather than cooling the IT equipment directly; utilizing refrigerant-based cooling.

Commonly referred to as Computer Room Air Handlers when circulating chilled water instead of refrigerant.

***Cryptocurrency Mining Facility*:** A facility of any size that is dedicated to operating data processing equipment for cryptocurrency mining and the process by which cryptocurrency transactions are verified and added to digital ledgers. This includes data mining facilities.

Data Processing. The collection and manipulation of digital data to analyze and produce meaningful information.

***Data Center*:** A physical facility housing the people, hardware and software organized to provide information processing services. This includes data processing facilities, server farms and artificial intelligence / "AI" data centers. Data centers are further defined by the following:

1) ***Ancillary Data Center:*** A data centers that is ancillary to another primary use and a) occupy no more than ten percent of the building's footprint, b) are used to serve the enterprise functions of the on-site business and are not used to lease data storage and processing services to third parties, and c) are not housed in a separate, stand-alone structure on the parcel.

2) ***Minor Data Center:*** A Data Center that is under 10,000 total square feet (for all buildings and structures on the site). If a minor data center requires an electrical substation and/or water treatment plant, it shall be classified as a Medium Data Center.

3) ***Medium Data Center:*** A Data Center that is between 10,000 square feet and 99,999 total square feet (for all buildings and structures on the site).

4) ***Major Data Center:*** A Data Center that is between 100,000 square feet and 499,999 total square feet (for all buildings and structures on the site).

5) ***Data Center Campus:*** A Data Center Campus shall consist of more than one Data Center building and may be any combination of sizes of Data Center buildings, not to exceed a total of 750,000 total square feet (for all buildings and structures on the site).

Decibel, dB: A decibel (dB) is a common measure of sound intensity that is one-tenth of a bel (B) on the logarithmic intensity scale.

Decibel-dBA: Decibels measured in dBA are weighted to the frequencies in the middle of the range of human hearing, as a representation of the perceived overall loudness.

Decibel-dBC: Decibels measured in dBC are weighted to the low-frequency, sounds which travel and penetrate farther than treble sound, often a component of tonal noise.

Decibel-dBZ: Decibels measured in dBZ are weighted to measure without frequency-based adjustments, for situations requiring a precise measurement of the sound's total energy and frequency content.

Direct Liquid Server Cooling: Server cooling technologies in which liquid coolant directly removes heat from electronic components through immersion or cold-plate contact, rather than through room air circulation.

Direct-to-Chip Cooling: A method of liquid cooling that utilizes coolant to dissipate heat directly from computer processing chips and greatly reduces electrical power and water consumption.

Dry Cooler: a heat rejection system which utilizes fans to move ambient air over a cooling coil; commonly used in closed-loop cooling systems.

Electrical Substation: An electric system facility that converts higher voltages to lower voltages within or separate from a ~~data center~~high impact land use to generate sufficient power at maximum efficiency; can operate independently for dedicated sites once directly connected to the transmission line.

Equipment Cooling: Cooling for equipment, including but not limited to machinery, computer component cooling, processor cooling, server cooling, rack cooling, generator cooling, electrical component cooling.

Facility Cooling: Cooling for the facility/structure itself, not for equipment, machinery or components located therein and/or on the property. This includes HVAC cooling.

Generator: A machine that converts one form of energy into another.

High Impact Land Use: A term that refers to a) an industry or business with higher than average consumption/use of resources, typically of electricity and/or water, and/or b) an industry or business with operations that are highly impactful from the standpoint of noise, vibration, type of power potentially used such as battery storage systems, nuclear, etc., utilization of private power substations or switch stations, onsite fuel storage and potential negative impacts on health, water and air quality. This includes data centers, data processing facilities, server farms, "AI" artificial intelligence, cryptocurrency mining facilities, and digital currency mining.

Hydrogen Fuel Cell: An electrochemical device that combines hydrogen and oxygen to produce electricity.

Infrasound: A low frequency sound below a frequency of 20Hz that is typically sub-audible to humans and often perceived as vibrations.

***Liquid Immersion Cooling*:** A method of liquid cooling that utilizes submerging equipment in fluid that does not utilize large volumes of water and greatly reduces electrical power consumption and offers an option for use of plant based biodegradable non-flammable oil.

Megawatt: A unit of power output equal to 1,000,000 watts or 1,000 kilowatts, used to measure power consumption.

Octave Band: A method of splitting the frequency spectrum into sections where the upper limit is twice the frequency of the lower limit, identified by the center frequency.

Power Usage Effectiveness (PUE): a ratio that describes how a High Impact Land Use ~~data center~~ uses energy; specifically, how much is used by the IT equipment compared to total power consumption. Calculated by dividing total facility energy by IT equipment energy.

Renewable "Green" Hydrogen: Renewable or "Green" Hydrogen is used for Hydrogen Fuel Cells and is sourced from water, using sustainable electricity sources such as solar or wind.

Sensitive Receptors: Sensitive receptors are locations where people, communities, environmental resources, or facilities may be particularly vulnerable to adverse effects from noise, air pollution, odors, vibration, light, hazardous materials, or other project-related impacts. These include ~~S~~schools, preschools, daycares, health facilities such as hospitals, long-term care facilities, retirement and nursing homes, community centers, places of~~–~~ worship, playgrounds, parks, campgrounds, prisons, dormitories, hotels, motels, and any parcels zoned agricultural residential, single-family residential and multi-family residential.

Standalone Modular Data Center / Cryptocurrency Mining Facility: Pre-engineered, prefabricated, temporary and standardized buildings, including shipping containers, designed to house computer servers and network equipment.

Tonal Noise: A noise characterized by a distinct, recognizable frequency, which stands out significantly against the background broadband noise, considered a nuisance due to the human auditory system's sensitivity to pure tones, especially when they are continuous.

Total Power-Usage Effectiveness (TUE): A metric similar to PUE but which includes IT power such as server fans and internal power distribution losses with infrastructure overhead, to provide a better metric of energy efficiency across the entire data center development. Calculated by dividing the total facility power usage by the compute power usage.

Water Usage Effectiveness (WUE): a metric that measures how efficiently data centers use water by comparing the total water used to the power used by its IT equipment.

Calculated by dividing annual water usage (liters) by IT equipment energy usage (kilowatts).

Amending Articles 5, 8-13 to allow data centers as Permitted Accessory Uses or Permitted Principal Special Uses with Conditions.

Ancillary data centers will be allowed as Permitted Accessory Uses in the following districts:

- Article 5– RT Research & Technology– Section 5.04
- Article 8– OS Office Service District– Section 8.04
- Article 9– NSC Neighborhood Service Commercial District– Section 9.04
- Article 10– RSC Regional Service Commercial District– Section 10.04
- Article 11– HSC Highway Service Commercial District– Section 11.04
- Article 12– IF Industrial Flex Zone– Section 12.04
- Article 13– I Industrial District– Section 13.04

Minor data centers will be allowed as Permitted Principal Special Uses with Conditions, subjected to the standards of Section 16.23, in the following districts if also located within the High Impact Land Use Overlay District:

- Article 12 – IF Industrial Flex Zone – Section 12.03
- Article 13 – I Industrial District – Section 13.03

Commented [PM1]: *No matter the zoning district, data centers of any size will only be allowed in the overlay district. A substantial portion of the overlay district is zoned or planned for industrial flex. If minor data centers were not permitted in IF the majority of the overlay district would not allow for any data center other than an ancillary data centers.*

Medium data centers will be allowed as Permitted Principal Special Uses with Conditions, subjected to the standards of Section 16.23, in the following district if also located within the High Impact Land Use Overlay District :

- Article 13 – I Industrial District – Section 13.03

Major data centers will be allowed as Permitted Principal Special Uses with Conditions, subjected to the standards of Section 16.23, in the following district if also located within the High Impact Land Use Overlay District:

- Article 13 – I Industrial District – Section 13.03

Campus style data centers will be allowed as Permitted Principal Special Uses with Conditions, subjected to the standards of Section16.23, in the following district if also located within the High Impact Land Use Overlay District:

- Article 13 – I Industrial District – Section 13.03

Amend Section 14.45 PERFORMANCE STANDARDS to removed exmeptions for sites with background noise that exceeds requirments.

Section 14.45 B. Noise.

4. Background Noise. All noise generated from any new uses shall conform to the specific levels in table 14-1 even if ~~Where~~ there is existing background noise that exceeds the maximum permitted levels specified in Table 14-1~~, the noise caused or created by a specific operation or activity may exceed the levels specified in the Table, provided that the sound level on property adjacent or in close proximity to the lot or parcel on which the operation or activity is located does not exceed the background noise level. For purposes of this subsection, background noise shall mean noise being produced by permitted uses conducted in a legally accepted manner from all sources other than those occurring on the lot or parcel on which the operation or activity is located. Background noise levels shall be determined by measurement at substantially the same time and location as the noise levels caused or created by the complained of operation or activity.~~

Amend ARTICLE XVI SPECIAL USES to add revocation provisions

Section 16.0X REVOCATION

The revocation of a Special Land Use may occur if its recipient fails to abide by its terms, conditions, or development agreement. The revocation procedure is as follows:

A. If the Township receives credible information that the Special Land Use Permit or conditions of approval have been violated, the Zoning Administrator or their designee must prepare a report in writing specifying (i) the specific factual details of such violation(s); and (ii) any other information or recommendation relevant to a proper determination by the Township Board as to the nature of such violation(s) and the appropriate action to be taken by the Twonship.

B. The Zoning Administrator or their designee, after the investigation and based on the facts discovered, will determine if the case goes forward. If the case does not go forward, the Zoning Administrator or their designee must give the approving body a written report as to why that determination was made. If the case goes forward, the process in subsections C-H below must be followed.

C. The Zoning Administrator or their designee must file the original report outlining the violation and evidence of such violation with the Township Board and serve a copy of such report upon the owner of the parcel for which the Special Land Use Permit was granted or its authorized agent or employee, personally or by registered mail.

D. After the report has been filed with the Township Board the Zoning Administrator or their designee must set a date for a hearing before the Township Board on the alleged violation(s) for a determination by the Township Board as to revoke the Special Land Use Permit. Notice of this hearing must be served by the Zoning Administrator or their designee upon the owner of the parcel for which the Special Land Use Permit was granted or its authorized agent or employee, personally or by registered mail, not less than ten days before the scheduled hearing date, and such notice must contain the following:

1. Notice of proposed action;

2. Reason for the proposed action;

3. Date, time, and place of hearing;

4. A statement that the parcel owner may present evidence and testimony and confront adverse witnesses;

5. A statement that the parcel owner has the right to be represented by legal counsel at the hearing.

E. At all such hearings, the parcel owner has the legal right to defend against the allegations made by way of confronting any adverse witnesses, by being allowed to present live witnesses on their own behalf, by being allowed to present other evidence on their own behalf, and by being allowed to present arguments personally or through legal counsel in their own behalf.

F. The Township Board must prepare a written statement of its findings, which may be formal or informal in nature, after the conclusion of all such hearings. Such statement of findings may be embodied in a resolution adopted by the Township Board.

G. If the Township Board determines after due notice and proper hearing that competent, material, and substantial evidence exists that a violation of the Special Land Use Permit and the conditions of approval has been committed by a parcel owner or that, even if no violation has been demonstrated, nevertheless the interests of public health, safety, or welfare warrant that the Township Board revoke the Special Land Use Permit issued to the parcel, the Township Board may revoke the Special Land Use Permit.

H. **Criteria for revocation.** The Township Board may revoke the Special Land Use Permit, based upon competent material and substantial evidence presented at the public hearing, that any of the following exists:

1. Violation of the Special Land Use Permit, any of the conditions of the Special Land Use, and any provisions of a development agreement attached to the Special Land Use Permit.

2. Abandonment of the Special Land Use by the parcel owner for a period of six months.

3. Maintenance of a nuisance upon the premises, including, but not limited to, any of the following:

   a. Existing violations of building, zoning, health, fire, or regulatory codes.

   b. A pattern of conduct on the parcel which violates the terms of the Special Land Use Permit.

   c. A pattern of conduct on the parcel creates a public nuisance.

   d. Perjury or any material misrepresentation of information in any application required or hearing held pertaining to the grant, renewal, or revocation of any license or permit.

Amend Section 18.02 OFF-STREET PARKING REQUIREMENTS

G. Off-street parking space requirements. The minimum required off-street parking spaces are set forth as follows:

Use	Parking Space Requirements	Use	Parking Space Requirements

High Impact land Uses	One (1) space for each employee working at maximum shift plus 5 visitor spaces

Commented [PM2]: Using floor area is inappropriate as much of the floor area is taken up by servers and not by employees. It would result in the site being over parked with unnecessary impervious surface.

Adding New Section 16.23: High Impact Land Use Overlay District

A. Purpose and Intent

The purpose of this ordinance is to establish a clear and thoughtful regulatory framework that addresses the unique characteristics of high impact land uses for the suitable zoning, siting, design, construction, operation, compliance and decommissioning of high impact land uses including but not limited to data centers and cryptocurrency mining facilities. These regulations are intended to guide the placement and design of high impact land uses to balance stable local economic growth with the protection of community health, safety, welfare, natural resources, and the area's rural character. The intent of this ordinance is to permit only uses having performance characteristics which emit a minimum of noise, vibration, smoke dust, dirt, glare, toxic materials, offensive odors, gases, electromagnetic radiation or any other physically adverse effect to the extent that they are abnormally discernible or potentially harmful beyond the lot lines of the parcel or site upon which the use activity is located. This is achieved by:

1. Directing high impact land uses to areas where industrial uses are currently permitted or planned and that would have minimal impact on residents and surrounding properties with the use of a clearly designated high impact land use overlay district located.

2. Minimizing, avoiding, and mitigating impacts such as noise, vibration, light/glare, air pollution and emissions, and water pollution through requiring the use of minimally impactful machinery, equipment, and systems.

3. Ensuring the efficient consumption and use of public utilities, such as water and electricity, prioritizing cooling systems and facility designs that enable facilities to meet strict usage effectiveness metrics~~renewable energy and conservation~~.

4. Promoting context-appropriate architectural design and effective visual screening to ensure a visually cohesive design and compatibility with the surrounding land uses and the desired rural character of the area.

5. Establishing clear expectations and a predictable review process for developers to encourage efficient and well-planned designs, while retaining local control over development.

6. Ensuring compatibility with adjacent land uses and the Township's Master Plan.

7. Ensuring compliance with responsible regulations for construction, operation, compliance, decommissioning and site restoration.

Commented [PM3]: Allowing for HILU within the overlay district where industrial use are planned is consistent with the proposed strategy.

Commented [PM4R3]: The overlay districted was designed to include planned areas as well.

B. Applicability

1. This section shall apply to high impact land uses including all types of data centers Ancillary, Minor, Medium, Major, and Data Center Campuses, and cryptocurrency mining facilities.

2. A complete preliminary site plan for all phases of the development that meets the requirements in Article XX shall be included ~~in~~ with the application along with applicable fees.

3. All developments subject to this section shall require an application of a special land use subject to the requirements of Article 16.

4. Approval is contingent upon the applicant demonstrating conformance to the requirements of this section, any other provisions of the Zoning Ordinance, and all other applicable Township Ordinances.

5. The applicant must enter in a development agreement with the Township.

6. All developments subject to this section shall be required to have a performance guarantee as outlined in Section 20.15.

7. The township board shall establish a fee for all ~~hi~~ high impact land uses applications to be added to the fee schedule.

C. Districts Permitted

High impact land uses including data centers and cryptocurrency mining facilities shall only be developed in districts where permitted as an Accessory Use, ~~Principle Use~~ or Principal Special Uses with Conditions if the property is located within the High Impact Land Use Overlay District on the Township's Official Zoning Map.

D. Required Engagement Steps (minimum standards)

1. Pre-application conference (mandatory)
   a) Applicants shall meet with planning staff prior to submitting an application.
   b) Staff shall identify expected engagement topics, impacted stakeholders, and the required contents of the Community Engagement Plan.

2. Community Engagement Plan (CEP) (required with application)
   a) A CEP shall be submitted as part of the application package and must include:
      - Project overview (site, size, phasing, anticipated construction timeline);
      - Draft public information materials (fact sheet, FAQs);
      - Engagement schedule and methods;
      - Proposed meeting formats and locations (including virtual option);
      - List/map of stakeholders and the Engagement Area;
      - Languages and accessibility accommodations;

Commented [PM5]: Article 20.

Commented [PM6]: There may be improvements that are to be made as part of the project that were to be community benefits, such as utility extensions that would still be warranted to complete even if the project fails to move forward and a decommissioning bond is used to decommission the project.

- Communication channels (project website, email list, hotline);
- Process for documenting comments and responses; and
- Proposed Risk Mitigation

b) The Zoning Administrator shall determine whether the CEP is complete prior to scheduling public hearings.

3. Neighborhood meeting(s) (mandatory, prior to first public hearing)
   a) The applicant shall hold at least one neighborhood meeting no fewer than 21 days and no more than 60 days prior to the first public hearing.
   b) Notice shall be given to all property owners and addresses (if different) within 500 feet of the proposed project site. If a property is within 500 feet and is part of a subdivision, homeowners, or business owners association, all members of the association shall be notified.
   c) Additional neighborhood meetings may be required if:
      - There are significant amendments, based upon determination of the Zoning Administrator, to the plan between Planning Commission or City Council reviews; or
      - The Planning Commission or City Council directs additional engagement due to public interest.

   d) Meeting requirements:
      - Held at an ADA-accessible location within the City of Howell and scheduled after 5:00 p.m. on a weekday or on a weekend;
      - Virtual participation option must be provided;
      - Applicant must provide interpreters upon request with at least 7 days notice; and
      - Meeting must include a Q&A segment and accept written comments.

4. Report
   a) After each neighborhood meeting, the applicant shall submit a report to the City providing at a minimum, the following meeting details:
      1. Meeting details (location, time, etc)
      2. Meeting sign in sheet
      3. Meeting minutes

D. Application Requirements

1. In addition to the required information for a site plan in Article XX an~~d A~~applicant shall provide the following impact studies to accompany any application:
   a. Projected power use.
   b. Projected water use.
   c. Projected natural gas use.
   d. Plans for any onsite power generation.
   e. Projected PUE, TUE and WUE with supporting documentation.
   f. Serviceability statements fully disclosing whether any utility needed has current capacity to service the needs of the facility at time of full commissioning, and if not: a plan for what is needed with a signed infrastructure development agreement verifying all costs for needed upgrades will be the developer or operator's responsibility.

g. Serviceability statements from local emergency providers, fire, EMS and police fully disclosing their ability to provide services for all phases of construction and upon full commissioning, and if not: a plan for what is needed with a signed development agreement verifying that all costs for needed upgrades, staffing, training and equipment will be the owning parent company's responsibility.
h. Projected noise levels (dBA, dBC and dBZ), vibration levels, noise mitigation features/plan and noise monitoring plans for the facility based on being fully operational and for the construction period.
i. Emergency and disaster plan for all phases, including construction.
j. Decommissioning and site restoration plan.
k. Traffic study for all phases, including construction.
l. Public facility, utility, and service impact assessment conducted by a licensed professional engineer.
m. All exterior building elevations for each structure.
n. Mechanical plans for the overall site.
o. Rooftop mechanical and electrical plans.
p. Electrical plan for the overall site including underground lines.
q. Preliminary project timeline with estimated durations for each stage of work, including site prep, and detailed schedule for any pile driving.
r. Equipment cooling system specifications.
s. List of regulated substances, including any cooling solutions.
t. Construction plan, ~~Site lighting plan,~~ including lighting plan for during the construction phase.
u. An economic impact analysis.
v. A job creation report

2. The Township Board Shall adopt fess for a High Impact Land Use site plan application.

~~t.~~

E. Dimensional Standards and Siting Requirements

Table X below outlines the dimensional regulations and siting Requirements for data centers and cryptocurrency mining facilities within the High Impact Land Use Overlay District. Where the regulations in table X are different from the requirements in Section 3.17 the more stringent requirements shall apply.

Table X - Dimensional Regulations and Siting Requirements for within the High Impact Land Uses

Facility Type	Allowable Facility Size Ranges in Square Feet	Setbacks from all property lines	Required Distance in Feet from Residential and Sensitive Receptor Parcels

Commented [PM7]: May need to discuss these distances.

Ancillary Data Center	Not to exceed 10% of the associated Principal Use's building footprint	Minimum district standard	-
Cryptocurrency Mining	Not to Exceed 5,000	200 feet	Greater than 900 feet
Minor Data Center	Not to Exceed 10,000	200 feet	Greater than 900 feet
Medium Data Center	Within 10,000 – 99,999	200 feet	Greater than 900 feet
Major Data Center	Within 100,000 – 499,999	400 feet	Greater than 1,200 feet
Data Center Campus	Not to Exceed 750,000	400 feet	Greater than 1,400 feet

F. Site, Design and Use Standards

1. Screening and Landscaping Requirements.

   a. All ground level equipment (including HVAC, generators, transformers, and cooling towers) shall be fully screened by masonry walls, architectural panels, or landscaped berms that contain staggered rows of evergreen landscaping material so that said screening shall achieve 100% opacity and exceed the vertical height of the equipment being screened by at least six (6) inches within two (2) years of planting.

   b. All rooftop mechanical equipment shall be fully screened behind parapet walls, which shall not exceed the maximum building height restriction.

      A minimum 25-foot greenbelt shall be provided along all property lines.

   c. Additional ~~L~~landscaping requirements are subjected to Section 28.03.A.

2. Parking requirements

   a. Parking requirements shall follow the standards of Section 18.02 for Data Centers.

   ~~b. Employee and visitor parking lots shall be set back at least fifty (50) feet from all property lines.~~

Commented [PM8]: This is noted below.

3. Noise, Sound and Vibration Requirements

Intent for Noise, Sound and Vibration Requirements: Additional noise, sounds and vibration requirements are imposed on High Impact Land Uses because they are known to produce lower frequencies. Unlike standard dB(A) measurements, which primarily detect mid-range sounds like speech and traffic, dB(C) measurements capture deeper, low-frequency noises such as infrasound from heavy machinery. These sounds can travel farther and penetrate walls, making them more disruptive in residential areas even when the source of the noise is in a non-residential district. Adding dB(C) limits ensures that noise enforcement addresses all types of sound, improving fairness and effectiveness in line with the intent of this ordinance. Including dB(Z) limits ensures that noise enforcement aligns with the intent of the ordinance and protects the community from potential health impacts in addition to nuisance.

~~3.~~

   a. Sound levels shall not exceed 55 dBA, 55dBC and 70dBZ at any high impact land use parcel. Generators shall not exceed 65 dBA, 55dBC and 70dBZ at the high impact land use parcel property line. All octave bands and frequencies 200 hertz (Hz) and below shall not exceed 60dBZ at any time.

   b. In the event pre-construction sound studies document pre-existing sound levels for A, C, and Z weightings that exceed the limits in this ordinance, then the background noise shall be removed from any sound studies to ensure only the HILU's noise is being measured and studied. However, the sound study should demonstrate that any pre-existing sound levels shall not be ~~exceeded or~~ amplified.

   c. Vibration shall not exceed limits outlined in Section 14.45.C of the Township Ordinance.

   d. Noise and vibration limits apply to all equipment on site including but not limited to hvac systems, equipment cooling systems, mechanical yards, substations, chillers, renewable energy systems, and generators, any of which may need to utilize sound-dampening enclosures, modifications and/or isolation pads to mitigate noise and vibration.

      ~~i. Applicant shall submit documentation of seasonal HVAC maintenance for any facility cooling systems to ensure quiet equipment operation.~~

e. Noise/Sound Studies: A noise attenuation, or sound modeling study shall demonstrate compliance with maximum sound levels and must be submitted prior to the approval of a final site plan. This study must be specific to the proposed site topography, layout, and building type, scale, height, and construction proposed. This study must show noise conditions at the site at locations determined by the township prior to the project development must provide model-predicted noise conditions resulting from the proposed project post-development to demonstrate anticipated compliance with the noise ordinance.

i. The sound study must be prepared by a professional sound/acoustical engineer ~~chosen by the Township and be~~ licensed in accordance with ISO 9613 standards.

ii. All sound studies shall include measurements and reporting for dBA, dBC and dBZ wavelengths, and shall include a full, unweighted one-third (1/3) octave band frequency spectrum analysis.

iii. Sound modeling studies must include recommendations for sound mitigation measures, if they are necessary for the use/facility to comply with sound level requirements. These mitigation measures, if applicable, must be reflected on the site plan and incorporated into conditions of the site plan approval. If mitigation measures are building related, they must be included in the building plans, and if they are landscaping related, they must be included in the landscaping plan prior to issuance of the Special Use permit(s).

iv. Sound study/routine sound surveillance schedule and additional requirements: a sound study must be submitted to the Township within 60 days of issuance of a certificate of occupancy for each phase of development and upon the facility becoming fully operational. Sound monitoring reports shall be provided monthly for the first year to establish seasonal baselines, as weather conditions affect how sound travels. Additional sound studies may be required at the time modifications of any kind are made, at the discretion of the Township.

v. All sound studies must be conducted at a time known for peak facility, use, and cooling system operations. In the event the study shows that the facility or use exceeds maximum allowable levels, the operator must immediately undertake all necessary efforts to comply.

4. Generator Use Requirements

a. Generator use is limited to emergency backup power generation during area power outages only, shall operate 50% or less of the total facility operations,

Commented [PM9]: The township will engage their own consultants to review the sound study prepared by the applicant's consultants.

for no more than 12 hours a day (8am-8pm), with occurrence for use not to exceed three (3) consecutive days without a twenty four (24) hour continuous break/off period.

b. Generators shall be connected to utility provided natural gas only.

c. Generator testing hours: Testing of generators shall be limited to 9am-1pm weekdays only, except for holidays, not to exceed occurrence on more than ten (10) days per each calendar month. The facility shall provide a generator testing schedule, posted on a website for public access, updated 60 days in advance.

d. Generator fuel storage requirements.

i. Fuel storage tanks shall not be within the required setbacks.

ii. Fuel storage tanks shall be placed underground or be screened on all four (4) sides with a fence or wall following the requirements of Sections 14.26 and 28.08.

iii. Fuel storage tanks shall have a maximum capacity of two thousand five hundred (2,500) gallons.

5. Electrical and Utility Lines

a. All electrical and utility lines shall be placed underground.

6. Lot Coverage and Setbacks Requirements

a. Lot coverage is limited to 50% for all impermeable surfaces.

b. Setbacks: Minimum setback requirements for all structures, equipment and storage yards shall comply with Table X except that employee and visitor parking lots may be set back no less fifty (50) feet from ~~all~~ any property lines.

7. Massing, Scale, Height and Orientation Requirements

a. Building mass, height, bulk, scale, and proportion shall maintain consistency with the existing character of the adjacent buildings.

b. Building design should employ coordinated massing to produce overall unity, scale, and interest.

c. Rooflines and pitches shall be proportionate to nearby structures so as to provide transition or mitigation of significant changes to scale.

d. Maximum height for all buildings is 50 feet, including all rooftop equipment, which shall be concealed by a parapet wall.

e. Orientation shall prioritize utilization of buildings for sound mitigation and visual buffer(s):

i. Where multiple buildings exist they shall be oriented so that service areas face each other and the buildings are placed to surround any equipment, mechanical yards, substations, generators, etc. in order to utilize the buildings as a sound barrier and as a visual buffer between the loudest operations on the site and the site borders.

ii. If a site contains two or fewer buildings, the buildings shall be oriented to place any equipment, mechanical yards, substations, generators, etc. on the farthest side/greatest distance away from the highest number of nearby residential and sensitive receptor parcels, and the building(s) between as a sound barrier and as a visual buffer between the loudest operations on the site and the residential and sensitive receptor parcels.

iii. Any equipment, mechanical yards, substations, generators, and similar elements shall be fully enclosed whenever possible if located within one thousand five hundred (1,500) feet from any residential property line.

8. Architectural Design and Building Materials

a. Facade variation. Wall designs must provide a minimum of three of the following elements, in addition to transparency requirements, occurring at intervals no greater than 25 feet horizontally and 10 feet vertically:

i. Expression of structural system and infill panels through change in plane not less than three inches.

ii. System of horizontal and vertical scaling elements, such as belt course, string courses, cornice, pilasters.

iii. System of horizontal and vertical reveals not less than one inch in width/depth.

iv. Variations in material module, pattern, and/or color.

v. System of integrated architectural ornamentation.

vi. Green screen or planter walls. vii. Translucent, fritted, patterned, or colored glazing.

vii. Transparency as required in Section 16.23(F)(2)(b).

b. Transparency

i. Windows for building sides shall be concentrated toward the front edge of the building, in locations most visible from an urban open space or public right-of-way.

ii. Transparency alternatives. The following alternatives may be used singularly or in combination for any side or rear facing facade which requires transparency. If used in combination, they may count toward no more than 50% of the transparency requirement set forth in Section 16.23(F)(2)(b).

c. Architectural style shall not be restricted. Rather, evaluation of the appearance of a project shall be based upon compatibility and the quality of its design and relationship to surroundings.

d. Buildings within the same development should be designed to provide a unified and easily identifiable image. Methods to achieve this include using similar architectural styles and materials, complementary roof forms, signs, and colors.

e. Minimize monotony of expansive exterior walls by incorporating the following elements: staggering of vertical walls; recessing openings; providing upper-level roof overhangs; using deep score lines at construction joints; contrasting compatible building materials; use of variety and rhythm of window and door openings; use of horizontal and vertical architectural elements, use of horizontal bands of compatible colors; and providing changes in roof shape or roofline.

f. Facades shall provide visual interest from both vehicular and pedestrian viewpoints.

g. Entrances to individual buildings shall be readily identifiable to visitors through the use of recesses or pop-outs, roof elements, columns, or other architectural elements.

9. Cooling System Requirements

~~9.~~ Intent for Cooling System Requirements: There are specific requirements for cooling systems associated with High Impact Land Uses because these uses have a tendency to consume a disproportionally large amount of water and power in the community, and because the primary source of water consumption at High Impact Land Uses are related to cooling systems, in order to align with the intent of this ordinance, to protect and ensure the efficient consumption and use of public utilities and natural resources, any system designed for cooling of the facility and/or equipment shall not negatively impact the surrounding region by

conforming to the following requirements:

a. Any system designed for cooling of the facility and/or equipment shall not negatively impact the surrounding region by conforming to the following requirements:

b. In addition to facilitating all PUE, TUE, and WUE standards in Section G.2.a, equipment cooling systems shall utilize closed-loop, direct liquid server cooling, with air movement limited to manufacturer-installed internal server fans used for auxiliary component cooling, in the following order of preference:

i. Utilization of liquid immersion cooling systems shall be prioritized, with preference for use of plant-based biodegradable non-flammable fluid over traditional dielectric fluid.
ii. If a proven incompatibility with liquid immersion cooling can be demonstrated and verified by an independent third party certified thermal engineer chosen by the Township, then utilization of zero-water direct-to-chip cooling systems may be approved for use as an alternate design option.
iii. If the applicant can provide documentation for another equipment cooling system which results in a better PUE, TUE, and WUE than liquid immersion cooling ~~another equipment cooling system which is equally or more efficient than liquid immersion cooling~~ and zero-water direct-to-chip cooling in terms of energy and water consumption, and equally or better at emitting a minimum of all frequencies of noise, then the township may approve its use as an alternate equipment cooling system.
iv. If another equipment cooling system option proves to be more efficient in terms of energy and water consumption, and its heat-rejection equipment is equally or better at emitting a minimum of all frequencies of noise as liquid immersion cooling and zero-water direct-to-chip cooling, once verified by a independent third party certified thermal engineer that system shall be required as the first preference.
v. If a proven incompatibility can be demonstrated and verified with any preferred equipment cooling system then the next preferred cooling system as outlined above will be the default alternate.
vi. No room-level or facility air/fan-based cooling systems such as, but not limited to, Computer Room Air Conditioning shall be used as the primary means of heat removal.
vii. Open-loop cooling systems and open-circuit cooling towers shall not be permitted.
viii. Cooling towers shall be closed-circuit and utilize drift eliminators.
ix. No Dry Coolers, Mechanical Draft, or Air Chillers shall be permitted.
x. In order to emit a minimum of noise, as is the intent of this ordinance, cooling systems and towers shall utilize the following features:
    a. Sound-absorptive enclosures
    b. Fans, motors, and pumps shall be mounted on vibration isolator
    c. Intake and discharge/exhaust silencers
    d. Aerodynamic fan noise reduction aids

e. Water-splash/basin silencers for water towers.

f. Additional noise mitigation measures, especially for low frequencies and infrasound, may be required to ensure compliance with the noise limits in Section E.2.

10. Accessory structure requirements:
    a. Temporary or modular structures are not permitted.
    b. Accessory structures shall be cohesive in design and color scheme to main structures on the parcel.
    ~~c. The use of intermodal shipping containers for storage and/or housing of any materials, substances or equipment is prohibited. Once the facility is operational, shipping containers are limited to shipping and receiving purposes only, shall not remain in place for longer than two (2) weeks at a time, and may not be located within set back areas nor within highly visible areas for any period of time.~~

Commented [PM10]: This is covered in the accessory structures ordinance recently adopted by the twp

11. Detention ponds
    a Detention and retention ponds are only permitted as part of the site drainage and stormwater management plan.
    b Detention and retention ponds for discharged facility water holding or use related to cooling purposes are not permitted.

G. Sustainability and Energy Use Requirements

1. Infrastructure Impact Statement

Applicants shall submit an Infrastructure Impact Statement at the time of conditional rezoning or permitted principal special use with conditions application, which must identify:

a. Utility Capacity Impact Statement from ~~the following~~ all utility providers to confirm service adequacy.~~:~~

~~i. DTE or Consumers Energy~~

~~ii. Marion-Howell-Oceola-Genoa (MHOG) Water Authority~~

b. Anticipated electric power demand (MW).

c. Anticipated water usage for cooling and other operations (gallons per day).

d. Waste heat recovery, reuse, or discharge methods.

e. Planned on-site backup generation capacity (MW) and associated

fuel type(s) with fuel storage capacity and design.

f. Anticipated natural gas demand.

g. Anticipated utility infrastructure upgrades required to serve the facility, with an agreement that the developer will pay 100% of all required upgrades.

2. Energy Efficiency

a. Data Centers must be designed to achieve a Power Usage Effectiveness (PUE) of 1.2 or lower, a Total Power-Usage Effectiveness (TUE) of 1.15 or lower, and a Water Usage Effectiveness (WUE) of 0.5L/kWh or lower. Applicant shall provide a report detailing how these parameters will be met, to be verified by a 3rd party professional consultant chosen by the Township.

b. Facilities shall incorporate best practices for energy conservation, including but not limited to: high-efficiency HVAC systems, waste heat reuse, variable-speed drives, and hot/cold aisle containment.

c. Applicant shall provide an operations Report detailing anticipated power demand and redundancy systems.

d. Applicant shall provide a heat recovery or reuse feasibility analysis (waste heat for district energy)

3. Renewable Energy Integration

a. Applicants are encouraged to incorporate on-site renewable energy generation (e.g., solar, wind, geothermal, DAKET, Renewable “Green” Hydrogen Fuel Cells) or to procure renewable energy from off-site sources. No on-site nuclear power generation shall be permitted. Decarbonized “Blue” Hydrogen and Traditional “Gray” Hydrogen are not permitted.

b. At least 25% of projected annual energy demand shall be demonstrated to be met through renewable energy sources, whether on-site or through power purchase agreements, renewable energy credits, or utility green-power programs.

c. On-site solar generation components shall comply with the requirements for solar in section ___ of the ordnance.

d. Energy storage systems shall be limited to Long-Duration Energy Storage (LDES). ~~Battery Energy Storage Systems (BESS) are not permitted.~~

4. Water Conservation

    a. If approved as an alternate option, facilities using water-based cooling must demonstrate the use of recycled, reclaimed, or non-potable water sources to the maximum extent feasible.

    b. No on-site wells shall be permitted.

5. Green Building Practices

    a. Facilities shall be designed to achieve LEED Silver certification or an equivalent third-party sustainability certification, to be verified by an independent third party certified professional consultant chosen by the Township, and shall provide documentation of certification within two (2) years of construction for each building.

6. Air Quality

    a. Regulatory Compliance: All generators, cooling systems, and other emission sources shall comply with federal Clean Air Act requirements and the Michigan Department of Environment, Great Lakes, and Energy (EGLE) air quality rules.

    b. Permitting: Facilities shall obtain and maintain any required Air Use Permit to Install (PTI) or other approvals from EGLE for stationary engines, cooling towers, or fuel storage.

    c. No on-site baseload power generation shall be permitted with the exception of the renewable energy generation listed in section G.3.a.

    d. Generator Emissions

        i. Generators shall meet or exceed current EPA Tier 4 Final emissions standards.

        ii. Generator Dispersion modeling could be required to meet air quality requirements or if a facility is within 500 feet of any residential, or sensitive receptor parcels.

    e. Renewable “Green” Hydrogen Fuel Cells systems are permitted for backup power generation. Decarbonized “Blue” Hydrogen and Traditional “Gray” Hydrogen are not permitted.

f. Emissions Reporting: Applicants shall submit an annual statement to the Township confirming compliance with EGLE permits and reporting actual operating/testing hours of backup generators.

7. Ongoing Reporting

a. Owners and operators shall provide an annual sustainability report to the Township, including:

i. Actual annual energy consumption (MWh).

ii. Actual annual water usage withdrawal and discharge (gallons).

iii. Energy efficiency performance & progress toward renewable energy targets.

iv. Documentation of any energy efficiency, cooling system upgrades, and security upgrades.

v. Actual Power Use Effectiveness (PUE), Total Power-Usage Effectiveness (TUE) and Water Usage Effectiveness (WUE).

vi. Actual generator runtime/use logs (hours).

vii. Actual job numbers, including how many employees are Livingston County Residents.

viii. Greenhouse gas emissions and/or carbon intensity of energy consumed.

10. Use of Consultants

The Township may hire third-party, independent consultants chosen by resolution of the township, to be funded by the developer through an escrow account to review energy efficiency, water consumption usage, air quality review, renewable energy implementation, and green building practices.

H. Security & Emergency Access

Security and Emergency Access. Data Centers shall be designed and operated to protect the facility, surrounding community, and public safety resources.

1. Perimeter Security

    a. Data Centers shall be fully enclosed with a perimeter security system, which may include fencing, or walls that meet the requirements of Sections 14.26 and 28.08. All fences or walls shall not be less than eight (8) feet in height.

    b. Security barriers shall be designed to balance safety with community character; opaque fencing must be screened with landscaping where visible from public roads or residential areas.

2. Controlled Access

    a. All site entrances shall include controlled access gates, guard stations, or equivalent security technology to prevent unauthorized entry.

    b. Visitor and delivery access points must be separated from employee access points wherever feasible.

3. Emergency Access

    a. A minimum of two (2) points of emergency vehicle access shall be provided, with clear signage and unobstructed pathways around the building.

    b. Access drives shall be constructed to fire department standards, with sufficient load-bearing capacity for emergency apparatus.

    c. Fire lanes shall be maintained free of obstructions at all times.

4. Camera Surveillance

    a. Data Centers shall install and maintain a perimeter camera surveillance system capable of monitoring all vehicular and pedestrian access points, building entrances, and outdoor mechanical/equipment areas.

    b. Cameras shall be positioned to minimize intrusion into adjoining residential properties and public rights-of-way, while still providing full coverage of the site.

    c. Camera systems shall be continuously operational (24 hours per day, 7 days per week) and recordings shall be retained for a minimum of 30 days.

d. A security plan, including camera layout, monitoring procedures, and data retention policies, shall be submitted as part of site plan review.

5. Fire Protection and Suppression.

    a. Data Centers shall be equipped with an automatic fire detection and suppression system designed to protect both building occupants and sensitive equipment.

    b. Suppression systems shall comply with National Fire Protection Association (NFPA) standards and be approved by the Fire Marshal.

6. Hazardous Materials Management.

    a. Any use of hazardous materials (including fuels for backup generators, batteries, and chemicals for cooling systems) shall comply with federal, state, and local storage, reporting, and disposal requirements.

    b. Applicants shall provide a Hazardous Materials Management Plan identifying on-site materials, safety data sheets, storage methods, spill prevention measures, and emergency response procedures.

    c. Applicant shall provide a fire protection plan.

7. Emergency Response Coordination.

    a. Applicants shall submit an Emergency Response Plan to the Township at the time of Site Plan review, which must include:

        i. Site layout for emergency responders.

        ii. Fire suppression and alarm systems description.

        iii. Backup generator location and fuel storage details.

        iv. Contact information for on-site security and facility management.

    b. Operators shall provide annual training opportunities or site orientations to local fire, police, and emergency medical services.

8. Lighting and Surveillance.

a. A lighting plan is required. The lighting plan shall include a photometric grid overlaid on proposed site plan showing light intensity (in foot-candles) on site and 25 feet beyond parcel lines.

i. Lighting shall adhere to Dark Sky principals—full-cutoff, directed downward, and shielded, with the use of motion sensors and timers where able. Illumination shall not exceed 0.1 footcandles onto adjacent properties measured three (3) feet from the ground.

b. Facilities shall incorporate continuous video surveillance of access points, perimeter fencing, and loading areas, with recordings maintained for a minimum of thirty (30) days.

I. Construction Standards

1. Applicant shall have a community complaint resolution liaison available 24 hours a day beginning with construction. The contact information shall be posted in a visible location from the road frontage, as well as provided to the township to be published on the website.

2. All complaints shall be responded to within 24 hours, and if not completely resolved then a resolution plan shall be provided to the township and complainant.

~~Construction shall adhere to the hours in the Township OrdinanceSection 14.45. B.6.(a). No construction is allowed to take place outside of those hours.~~

3. On site work shall be conducted Monday through Saturday between the hours of 7am and sunset, and Sunday 10:00 am and 6:00 pm.

4. The applicant shall submit a construction lighting plan that meets the requirements of Section 14.22.

~~3.~~

~~4.~~5. Construction Phase Requirements:

a. The developer or owner/operator will provide a full time onsite community liaison and 24 hour emergency line that will be available from the start of construction until full facility commissioning, this position shall have the authority to halt construction if necessary. Contact information for the community liaison shall be posted at the site on easily accessible / viewable signage and posted on the township website. All concerns and complaints shall receive confirmation of receipt within 24 hours and response within 5 business days.

b. A detailed schedule for any pile driving necessary and a complaint resolution plan shall be provided to the township prior to any construction work

Commented [PM11]: This section exempts construction noise between 7:00am and sunset, Monday through Saturday and between the hours of 10:00am and 6:00pm on Sunday.

beginning.

~~c. On site work shall be conducted Monday through Friday between the hours of 7am and 6pm.~~

J. Decommissioning

1. Decommissioning Plan Requirement. As a condition of site plan and special use approval, the applicant shall submit a Decommissioning and Site Restoration Plan that addresses

    a. Triggers for decommissioning.

    b. Methods for removal of structures, equipment, utilities, and impervious surfaces.

    c. Recycling and disposal of equipment and hazardous materials.

    d. Final grading, soil stabilization, and revegetation.

    e. Restoration of the site to a condition compatible with surrounding uses.

2. Triggers for Decommissioning

    a. A ~~use with~~ high ~~resource~~ impact land use shall be considered abandoned if it ceases operations or construction on the project is stalled for a period of 12 consecutive months, unless the owner provides evidence of intent to resume operations.

    ~~a.~~b. A revocation of a special land use permit shall trigger decommissioning.

    ~~b.~~c. Decommissioning must begin within 6 months of abandonment and be completed within 12 months.

    ~~c.~~ If at any time a high impact land use ceases operations for any amount of time, the structures and property, including landscaping and snow removal, shall be maintained at all times.

    d.

3. ~~Performance~~ Decommissioning Guarantee / Financial Assurance

a. Prior to issuance of a building permit, the applicant shall post a financial guarantee in the form of a letter of credit, bond, or escrow account acceptable to the Township.

b. The amount shall equal 125% of the estimated decommissioning cost, as determined by an independent third-party, qualified engineer and approved by the Township.

c. Estimates must be updated every 2 years and adjusted for inflation.

4. Removal Standards

a. All above-ground structures, including buildings, mechanical equipment, cooling towers, security fencing, and pavement not otherwise serving a reuse, shall be removed.

b. All Below-ground infrastructure, such as foundations and utilities, shall be removed to a minimum depth of 36 inches below grade unless otherwise approved.

c. Materials shall be recycled to the maximum extent practicable.

d. If the Planning Commission determines, based on independent, third-party contractor analysis and report paid for by the landowner in escrow, that existing primary buildings and/or office buildings have a viable use for other Permitted Principal Uses in the underlying zoning district, then the buildings identified may be exempted from being fully removed.

i The Planning Commission may allow the primary and office buildings to be renovated to be able to be repurposed for another viable Permitted Principal Use in the underlying zoning district.

ii The owner/operator shall provide full building plans detailing the renovations, and shall provide the cost, in escrow, for an independent, third-party contractor chosen by the township to verify the viability of the renovations for reuse.

iii All other specialized structures, mechanical yards, cooling equipment, and infrastructure that are not deemed to be repurposed for other, existing Permitted Principal Uses in the district shall be fully decommissioned according to Section H.4.a, b, and c.

e. The facility and property shall be maintained at all times, including snow

removal and landscaping, even when not operational including during and after decommissioning.

5. Site Restoration

    a. The site shall be restored with topsoil, seeded or planted with native vegetation, and stabilized to prevent erosion.

    b. The Township may approve alternate restoration plans if the site is proposed for redevelopment consistent with the Master Plan and zoning ordinance.

6. Failure to Decommission

    a. If the owner fails to complete decommissioning in accordance with the approved plan, the Township may draw upon the financial guarantee to complete the work.

    b. Any costs exceeding the financial guarantee shall remain the responsibility of the property owner.