

29 March 2012

Town of Nantucket  
22 Federal Street  
Nantucket, MA 02554

Attention: Lauren M. Sinatra \*\*\* (via email: [lsinatra@nantucket-ma.gov](mailto:lsinatra@nantucket-ma.gov)) \*\*\*  
Energy Project & Outreach Coordinator

Subject: Acoustical Consulting Services  
Review of Proposed Madaket Wind Project Reports  
Nantucket, MA  
Acentech Project No. 622024

Ladies and Gentlemen:

## Introduction

The Town of Nantucket is considering development of the Madaket Wind Power Project at the Nantucket Landfill and requesting Acentech to review and comment upon specific materials that address the potential sound impacts of the project. The proposed wind project currently envisions the installation of one PowerWind PW56 wind turbine rated at 900 kW (71 m hub height and 56 m rotor diameter) near the south end of the landfill near Massasoit Bridge Road. Noise-sensitive locations in the vicinity of the project include residences to the east and west of the landfill, and the nearest noise-sensitive location is a residence about 1200 ft to the southwest of the proposed turbine site.

The Town of Nantucket (Town) and Massachusetts Clean Energy Center (MassCEC) have specifically requested that Acentech review and comment on the following project materials provided to us:

- Report -- *Acoustic Analysis – Madaket Wind Turbine Project, Nantucket, MA*, dated 2/25/2011, by Atlantic Design Engineers, LLC (ADE).
- Report -- *Addendum to Acoustic Analysis – Madaket Wind Turbine Project, Nantucket, MA*, dated 10/6/2011, by ADE.
- Advisory Letter – *Madaket Wind Turbine Acoustic Analysis*, dated 2/1/2012, by Stephen E. Ambrose and Robert W. Rand of Rand Acoustics (A/R) for Common Sense Nantucket.

We also referred to the following items during our review:

- Document – *MassCEC Acoustic Study Methodology for Wind Turbine Projects*, dated 12/9/2011, by Massachusetts Clean Energy Center.
- Applicable criteria – State and local noise requirements.

The ADE addendum report (10/6/2012) concludes that the sound from wind turbine operation will comply with both the Massachusetts Department of Environmental Protection (MassDEP) noise guidelines and the Town noise bylaw at all adjacent residences. The report indicates that wind turbine sound would exceed the Town noise bylaw along the landfill south property line where present and future development is restricted. The A/R advisory letter report claims to find fault with the analysis and conclusions submitted by ADE. They conclude that the proposed wind turbine is expected to create noise detrimental to public health and well-being in nearby residential areas and that the proposed wind turbine is far too large for the quiet residential areas in the west end of Nantucket. I was able to speak with Mr. Sanderson of ADE and with Messrs. Ambrose and Rand and to discuss the project and get clarifications on their respective letter reports. Our comments on the ADE and A/R transmittals, and in addition, our recommendations for further action by the Town, are presented in this letter.

### **Comments on ADE's Acoustic Analysis Report and Addendum**

ADE's study and submittals are consistent and present useful information. The overall method of study used by ADE for the Madaket Wind Project is similar to the *MassCEC Acoustic Study Methodology for Wind Turbine Projects*. The ADE study consisted of identifying existing land uses, sound sources, property lines, and noise sensitive locations; measuring simultaneously the ambient sound levels at representative community locations along with local wind speeds for 10-minute periods; performing a regression analysis of the residual (L90, the quietest 10% of time in each 10-minute period) ambient sound level vs. wind speed with a selected wind shear condition; modeling the ambient sound, turbine sound, and combined sound for wind speeds ranging from turbine cut-in to maximum turbine sound output; and comparing the modeled estimates to the applicable State and local noise criteria.

#### *Ambient Sound Survey*

- The ambient sound survey included continuous measurements of the overall A-weighted sound level at one on-site and three community locations over a 72-hour period in January 2010. At two of the locations, the monitors also collected octave band spectral data; these data were saved although not needed in ADE's analysis.
- The ambient sound measurement locations appear representative of the noise sensitive receptors (residences) in the vicinity of the project. The Rion NA-28 monitors comply with ANSI Type 1 and IEC Type 1 standards; and although the Rion Model NL-31 and NL-22 monitors do not strictly meet the ANSI Type 1 standard, they do respectively meet the IEC Type 1 and 2 standards and are suitable for general purpose ambient sound surveys. The Rion NL-31 monitor does not include octave band measurement capability, but otherwise is consistent with the MassCEC methodology and its Type 1 requirement.
- The survey covered three days between Friday and Monday in late January 2011. During this time, the project area experienced calm to moderate wind conditions [7 m/s (15 mph) at 10m

reference height], which provided for a useful range of wind and ambient sound level data. We note that it would be helpful to the analysis to have also measured during periods with greater winds and associated ambient sound levels. The MassCEC methodology indicates a minimum 14-day survey during reasonable meteorological conditions, but does allow for a shorter time with an explanation of circumstances. The methodology does not specify a time of the year for the survey. We understand that the 3-day survey met the budget constraints for this wind project and that ADE employed similar 3-day ambient surveys on other wind projects in the past.

- The ambient survey did not include short term attended measurements; however, the field team did identify the typical sound sources in the community. The MassCEC methodology indicates that short term measurements are optional.
- The data indicate that the L90 sound levels (10-minute periods) ranged widely from about 20 dBA to 40 dBA during the nighttime hours. The L90 sound levels were in general correlation with the wind speeds during the nighttime hours. The A-weighted sound levels collected and employed in the analysis by ADE appear reasonable for the land uses and observed sound sources in the vicinity of the project site. We note that this range of ambient sound levels is typical of rural areas during nighttime hours.

#### *Regression Analysis*

- The regression analysis employed by ADE to quantify the nighttime ambient L90 sound level vs. wind speed is generally consistent with the MassCEC methodology.
- The estimated ambient L90 sound level associated with the turbine sound output at a particular hub height wind speed is highly dependent on the wind shear value. ADE selected a medium value for wind shear of 0.3. This is a reasonable average value for wind shear, although we recognize that at times it will be greater and at times less than this value.

#### *Sound Model Estimates*

- The sound level estimates for the project, which were developed with the WinPro computer model and the turbine vendor's data and the site and community layout, appear reasonable and comparable to the levels for other similar turbine projects. The Mass CEC methodology lists WinPro as an acceptable computer program for modeling wind turbine sound.
- The ground condition used in the model match that indicated in the MassCEC methodology ( $G=0.5$  for semi-reflective ground condition).
- The ADE analysis does not include an uncertainty factor (K) in the turbine sound power levels in the WinPro model. The MassCEC methodology indicates that an uncertainty factor of  $K = 2$  dB is to be added to the turbine sound power levels unless the turbine vendor provides another value. We note that if an uncertainty factor is not included in the turbine sound power levels, then this uncertainty should be considered in adopting an overall project design margin. Design margin is discussed below.

#### *Comparisons with State and local requirements*

- We recognize that the ADE analysis does not include an explicit design margin. We typically would recommend a design margin (e.g., 3 to 5 dB) whenever a project, including a wind project,

must meet specific sound requirements. The maximum sound level estimated by ADE at a residential location (Res 1-1) is about 4 dB less than the 45 dBA Nantucket baseline sound limit and 3 dB less than the MassDEP maximum allowable increase.

- ADE outlines the State (MassDEP) and local noise requirements and provides comparisons with each. These are also shown below at the end of our letter.
- As ADE indicates, the MassDEP Noise Criteria may be waived at a property line as long as the existing and possible future noise sensitive receptors are protected.
- The turbine octave band sound power levels in the ADE addendum do not indicate a tonal source per the MassDEP criteria and ADE has assumed that this modern design turbine will not produce a tonal condition per the MassDEP criteria.
- ADE identifies a nighttime limit of 45 dBA for the turbine sound at the residences, which assumes that the turbine does not produce impulsive or periodic sounds. Should the turbine produce significant impulsive or periodic sounds, then this limit could potentially be reduced by 5 dB in each case.

### **Comments on Ambrose and Rand Advisory Letter**

The Ambrose and Rand (A/R) letter critiques the ADE's submittals and provides their field measurements and observations on an operating PW56 wind turbine in Western Massachusetts. A separate section in their letter that pertains to the existing turbine at Nantucket High School is not part of our review.

#### *Ambient Sound Survey*

- A/R's letter faults ADE's ambient survey on several points, including microphone placement, survey duration, and little, if any, attended monitoring. I judge that although a longer survey, including times with greater winds, and additional field observations during daytime and nighttime hours would be helpful in confirming and refining the regression analysis, the ADE survey has provided a useful baseline. A/R's letter dictates an ambient survey method of attended round-the-clock monitoring over numerous days and nights. However, in my opinion, the A/R method would be unnecessary for this project and more costly than the usual survey method, such as the one outlined in the MassCEC methodology. A/R agreed that the range of sound levels measured by ADE were as expected and showed the area to be very quiet at times during the day and night.
- A/R states that MassDEP requires a minimum one-week survey. We are not aware of any MassDEP requirement for ambient surveys that must be conducted during the permitting phase of wind turbine projects. (For a project that requires an Air Permit, MassDEP may review the proposed design of the ambient sound survey and suggest changes on a case-by-case basis; and the results of the ambient survey and the project noise analysis are then submitted in a report with a Noise Form to MassDEP as part of the Air Permit Application, a process that we believe does not apply to wind turbine projects.)

### *Regression Analysis*

- A/R rejects the use of regression analysis to establish ambient sound levels based on measured wind conditions. A/R prefers to compare turbine sound levels to the ambient sound levels measured during the quietest calm wind conditions at the ground receptor locations. The regression analysis method, which was used by ADE for this project, is integral to the MassCEC methodology. The contrast in the ADE and A/R results is primarily due to the consultants assuming quite different wind shear conditions for their analyses. ADE uses an average value and A/R effectively uses a maximum value. Should wind shear be much greater than average on a regular basis, the turbine sound is likely to be heard more often above the background ambient sound and be more noticeable to some residents. We typically consider representative conditions that would include average wind shear conditions for our analysis and then recommend a design margin to address the range of uncertainties in the turbine sound emissions, sound propagation, and ambient conditions.

### *Sound Model Estimates*

- A/R measured the sound of a PW56 wind turbine at Berkshire East Ski Area in Western Massachusetts during its operation on 1/18/2012. Based on their measurements and observations, A/R concluded that this PW56 turbine produced sound levels consistent with the vendor test data, and also, produced noticeable tonal and impulsive sounds.
- A/R faults ADE for considering only one rather than a wider range of wind shear conditions in assessing potential sound impacts. Based on their experience, A/R believes that wind shear can be much greater than normal, that ambient sound levels can be much lower than estimated by the regression analysis method, and that this condition can greatly contribute to a community noise problem from wind turbines.

### *Comparisons with State and local requirements*

- A/R concludes that due to its height and size, the proposed project would fail to meet two regulatory noise standards: (1) the Code of Massachusetts Regulations, Title 310, Section 7.10 (Noise) as its noise levels will exceed the noise limits by more than 10 dB above the naturally occurring quietest hour background sound levels; and (2) the Town of Nantucket Noise Code Chapter 101, particularly if the turbine produces noticeable impulsive and/or periodic sounds. Information presented in the A/R report supports these conclusions; the question remains though, how often could one expect a risk with non-compliance with the regulatory standards? Review of the wind shear data collected in the past few years, wind shear data possibly collected at the Nantucket Airport, and longer term ambient sound and wind shear measurements collected in a possible future field program could help assess this risk.

### **Summary Comments**

- The ADE analysis is based on average wind turbine, meteorological, and ground conditions while the A/R analysis is based on significantly more conservative conditions.
- The proposed Madaket project, which consists of one 900 kW wind turbine, is in relatively close proximity (1320 ft northeast) of one residence. This residence and residences that are further away and in other directions from the turbine will at different times be upwind, crosswind, or downwind of the unit. The ADE addendum presents an estimated turbine sound level of 41 dBA at the nearest residence and 23 to 31 dBA at more distant residences in the ADE analysis.

- The sound of different makes, models, and individual wind turbines vary, although most modern well-designed units do not produce significant impulsive or tonal sound
- Based on the sound estimates presented by ADE, the wind turbine sound is expected to be heard by the nearest resident during many operating times, and particularly during the night hours when the ambient sound levels are less. The turbine sound would be at a much lower level, but still likely heard at times, at the more distant residences. Whether this condition would result in annoyance or complaints depends upon numerous acoustic and non-acoustic factors, including the character of the turbine and ambient sounds; and the activities, attitudes, and expectations of the community residents. All else being similar, we understand that wind turbine sound can become more annoying than other common sounds of equal level for some people, such as road traffic or industry, and particularly at night. Published studies have noted that some residents may become equally annoyed with wind turbine sounds that are as much as 10 dBA lower than other common environmental sounds. In addition, studies suggest that residents who participate financially in a wind project tend to be less sensitive by about 10 dBA to the turbine sound levels.
- Most people are accepting of the wide range of environmental sounds heard in their neighborhoods. However, when sound from a new facility is introduced into the environment it can be expected that some neighbors might report finding it to be intrusive, annoying, and difficult to accommodate. An extensive review of possible health impacts associated with wind turbine environmental sound, including infrasound and low frequency sound, is provided in the recent report prepared for the Massachusetts Department of Environmental Protection (MassDEP) and Massachusetts Department of Public Health (MassDPH). The expert panel authors report that “Most epidemiologic literature on human response to wind turbines relates to self-reported “annoyance,” and this response appears to be a function of some combination of the sound itself, the sight of the turbine, and attitude towards the wind turbine project.” Conclusions provided by the panel include “... the weight of the evidence suggests no association between noise from wind turbines and measures of psychological distress or mental health problems. None of the limited epidemiological evidence reviewed suggests an association between noise from wind turbines and pain and stiffness, diabetes, high blood pressure, tinnitus, hearing impairment, cardiovascular disease, and headache/migraine.” The panel does recommend that additional measurements and studies are warranted. The panel also considered German and Danish guidelines for villages with mixed usages and residential areas and recommends that nighttime sound limits of 37 to 45 dBA should be considered as “promising practices” for wind turbine sound in Massachusetts. Based on our experience, we understand that wind turbine projects indicate an increased risk of adverse reaction among some project non-participants when the turbine sound levels begin to exceed 40 dBA and a much greater risk when they exceed 45 dBA.
- From experience, we believe that the new character of the modulating “swoosh” in the turbine sound, which can become more audible at some times than at others, contributes to this risk in annoyance. This sound is new to the public and distinct from more common sounds, such as road traffic, train horns, and a neighbor’s air conditioner. An individual resident may become sensitized to the turbine sound and complain when he/she is able to hear it, even if the turbine sound is of a low absolute level or barely audible above other ambient masking sounds.

- Noise regulations, standards, criteria, and guidelines, etc. normally recognize the need to balance a community's interest in promoting development and in reducing adverse impacts. People can react quite differently to the same sound experienced within the same context. The individual reactions within a similar context can range from "sound not noticeable" or "sound noticeable, but bothersome," to "sound quite noticeable and annoying" or "extremely annoying and requiring complaints and legal action."
- The results of the ADE study predict compliance with the MassDEP Noise Criteria (allowable 10 dBA increase in broadband sound) and compliance with the Town's 45 dBA noise limit. Based on our experience, we expect that the turbine sound levels will at times be greater and at times be less than ADE's estimated levels due to variable operational, atmospheric, and ground conditions.
- If the sound of the actual operating turbine includes strong impulsive or periodic components, then the Town's limit could become 40 dBA or less at the property line and residences. Fortunately, most well-designed modern turbines produce a modulating "whoosh" sound rather than significant impulsive or tonal sound. We note that if the modulating whoosh sound becomes strong enough under some conditions, then it could possibly be deemed a periodic sound. Other periodic sounds could also include prominent tones. A/R observed tones from an operating PW56 turbine, and we agree that if the tones become strong enough, they could potentially be deemed a periodic sound under the Nantucket code even if they are not considered tones per the octave band definition employed in the MassDEP Noise Criteria. We note that the A/R data show relatively modest tones, however, the Nantucket Noise Bylaw does not provide a quantitative definition for either periodic sound or for impulsive sound.
- Based on the materials presented us and our experience, we would not be surprised if the turbine sound levels reached 3 to 5 dBA, or more on occasion, greater than the estimated levels in the ADE addendum. In addition, we would expect during certain times, such as higher wind shear conditions, an increase in the ambient sound greater than 10 dBA at the nearest residence.

### **Initial Recommendation**

- We recommend the initial action item to support the project review process: Interested parties should visit and observe operating turbines, preferably other PW 56 turbines, at community locations that are downwind/crosswind of the units for a representative period of time under typical wind conditions.

### **Final Comments and Recommendations**

- Established residents normally judge the noise of a new source more harshly than that of an existing source.
- Our experience with community noise indicates that some individuals will complain when a new source (e.g., ventilation fans, truck backup alarms) increases the ambient sound level by less than the 10 dBA "delta" in the MADEP Noise Guideline and the sound is distinctive and/or the individual believes the noise is unnecessary and can and should be controlled.

- Studies indicate that community residents are typically 10 dB more sensitive to wind turbine sound than other environmental sounds, such as highway or aircraft sound. And studies also indicate that residents who participate in a wind turbine project are typically 10 dB less sensitive to the wind turbine sound than those residents who do not participate. Development and mitigation plans for wind projects regularly include the participation of the nearest community residents.
- In the permitting of new baseload power plants in Massachusetts, The Energy Facilities Siting Board (EFSB) has typically set permit conditions that limit the maximum increases in the sound levels at community residences to less than the 10 dBA delta in the MADEP Noise Guideline (e.g., limiting increases to 6 or 7 dBA above the background L90 ambient).
- We typically suggest a 3 to 5 dBA design margin for many types of projects in recognition of the inherent uncertainties in modeling (source levels, noise control treatments, layout, ground conditions, etc.), the potential for late changes and additions of equipment, the possibility of some equipment exceeding its noise specification, and the concern about jeopardizing the acceptance of the overall project. Setting a project design criterion of a 5 to 7 dBA increase would address the MADEP guideline with some margin and reduce the potential for community complaints.
- Sound level increases of 5 or 6 dBA or greater and absolute sound levels of 40 to 45 dBA or more during turbine operation may well be acceptable at times and not result in significant community noise complaints. As stated above though, the risk for community complaints increases with greater absolute sound levels and greater increases in sound levels caused by wind turbine operation.
- We recommend that the Town conduct a longer term ambient sound monitoring program (minimum of two weeks) over a range of wind and ambient sound conditions with simultaneous wind and sound measurements. Ideally, the monitoring program should include hub height (and possibly, ground level) wind measurements in order to refine the regression analysis (and wind shear conditions) and to define better the residual ambient sound levels, particularly at higher wind speeds. The Town could consult historic wind data to select a time with an appropriate range of wind conditions.
- We recommend that the Town include the following language when requesting sound power level data from wind turbine manufacturers: “Wind turbine vendor shall submit sound power data that have been measured under the current version of the international standard IEC 61400-11 in order to characterize the sound emissions of the requested model. Data shall include octave band (63 Hz to 8000 Hz) and overall A-weighted sound power levels, tonality values, and the uncertainty level (K-factor) for the maximum sound output condition. The overall A-weighted sound power level shall be provided for each 1 m/s step in wind speed from cut-in wind speed to maximum wind speed. Information shall present the wind speeds for the 10m standard reference height and the requested model hub height, and shall identify the associated wind shear value.”

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Town of Nantucket  
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I welcome your comments or questions about our review or this letter. My direct-dial phone number is 617-499-8018.

Sincerely yours,

ACENTECH INCORPORATED

A handwritten signature in black ink, appearing to read "J. D. Barnes". The signature is written in a cursive style with a large initial "J" and "B".

James D. Barnes, P.E.

Attachments

MADEP Noise Control Regulation 310 CMR 7.10 & MADEP Air Quality Control Policy  
Sections of Town of Nantucket - Chapter 101. Noise Bylaw

xc: Leigh Cameron (LCameron@MassCEC.com)

**The Commonwealth of Massachusetts  
Department of Environmental Protection (DEP)  
Noise Control Regulation 310 CMR 7.10**

(1) No person owning, leasing, or controlling a source of sound shall willfully, negligently, or through failure to provide necessary equipment, service, or maintenance or to take necessary precautions cause, suffer, allow, or permit unnecessary emissions from said source of sound that may cause noise.

(2) 310 CMR 7.10(1) shall pertain to, but shall not be limited to, prolonged unattended sounding of burglar alarms, construction and demolition equipment which characteristically emit sound but which may be fitted and accommodated with equipment such as enclosures to suppress sound or may be operated in a manner so as to suppress sound, suppressible and preventable industrial and commercial sources of sound, and other man-made sounds that cause noise.

(3) 310 CMR 7.10(1) shall not apply to sounds emitted during and associated with: parades, public gatherings, or sporting events, for which permits have been issued provided that said parades, public gatherings, or sporting events in one city or town do not cause noise in another city or town; emergency police, fire, and ambulance vehicles; police, fire, and civil and national defense activities; domestic equipment such as lawn mowers and power saws between the hours of 7:00 A.M. and 9:00 P.M.

(4) 310 CMR 7.10(1) is subject to the enforcement provisions specified in 310 CMR 7.52.

**The Commonwealth of Massachusetts  
Division of Air Quality Control Policy  
Department of Environmental Protection**

This policy is adopted by the Division of Air Quality Control. The Department's existing guideline for enforcing its noise regulation (310 CMR 7.10) is being reaffirmed. A source of sound will be considered to be violating the Department's noise regulation (310 CMR 7.10) if the source:

1. Increases the broadband sound level by more than 10 dB(A) above ambient, or
2. Produces a "pure tone" condition - when any octave band center frequency sound pressure level exceeds the two adjacent center frequency sound pressure levels by 3 decibels or more.

These criteria are measured both at the property line and at the nearest inhabited residence. Ambient is defined as the background A-weighted sound level that is exceeded 90% of the time measured during equipment operating hours. The ambient may also be established by other means with the consent of the Department.

MassDEP has also clarified the application of its noise guidelines in an update on its website (ref: <http://www.mass.gov/dep/air/laws/noisepol.htm>). The website information includes a section - "Where Are MassDEP's Noise Criteria Applied?" - that states:

"The MassDEP noise pollution policy describes criteria that MassDEP uses to evaluate noise impacts at both the property line and the nearest occupied residence or other sensitive receptor. When noise is found to be a nuisance or a threat to health, MassDEP requires the source to mitigate its noise. Noise levels that exceed the criteria at the source's property line by themselves do not necessarily result in a violation or a condition of air pollution under MassDEP regulations (see 310 CMR 7.10 U). The agency also considers the effect of noise on the nearest occupied residence and/or building housing sensitive receptors:

- In responding to complaints, MassDEP measures noise levels at the complainant's location and at other nearby locations that may be affected (e.g., residences and/or buildings with other sensitive receptors). If the noise level at a sensitive receptor's location is more than 10 dB(A) above ambient, MassDEP requires the noise source to mitigate its impact.
- A new noise source will be required to mitigate its sound emissions if they are projected to cause the broadband sound level at a residence or building housing sensitive receptors to exceed ambient background by more than 10 dB(A).
- A new noise source that would be located in an area that is not likely to be developed for residential use in the future (e.g., due to abutting wetlands or similarly undevelopable areas), or in a commercial or industrial area with no sensitive receptors may not be required to mitigate its noise impact on those areas, even if projected to cause noise levels at the facility's property line to exceed ambient background by more than 10 dB(A). However, a new noise source that would be located in an area in which housing or buildings containing other sensitive receptors could be developed in the future may be required to mitigate its noise impact in these areas.

This policy has been designed to protect affected residents and other sensitive occupants of nearby property, but not necessarily uninhabited areas in and around the source's property. Sources of noise may need to implement mitigation if residences or buildings occupied by sensitive receptors are developed where they may be affected by the source's noise.”

*[Therefore, noise criteria may be waived at property line if existing and future noise-sensitive receptors are protected.]*

**Town of Nantucket, MA**  
**Sections from Chapter 101. NOISE BYLAW**

§ 101-2. Noises prohibited; exemptions.

A. Use districts. It shall also be unlawful to project a sound or noise, excluding noise emanating from cars, trucks or other vehicles, from one property into another within the boundary of a use district, which noise exceeds the limiting noise spectra set forth in Table I below.

Editor's Note: See § 101-4. Sound or noise projecting from one use district into another use district with a different noise level limit shall not exceed the limits of the district into which the noise is projected.

§ 101-4. Noise tables.

A. Table I: Limiting Noise Level for Use Districts

**Table I.**  
**Maximum Permissible A-Weighted Sound Level**

| <u>Use District</u> | <u>Day</u> | <u>Night</u> |
|---------------------|------------|--------------|
| District A:         |            |              |
| L-10 level (dBA)    | 55         | 45           |
| Maximum             | 68         | 58           |
| District B:         |            |              |
| L-10 level (dBA)    | 60         | 45           |
| Maximum             | 70         | 58           |
| District C:         |            |              |
| L-10 level (dBA)    | 60         | 60           |
| Maximum             | 70         | 70           |

Notes

1. For the purpose of this table, "day" shall be defined as 7:00 a.m. to 10:00 p.m. (7:30 a.m. between June 15th and September 15th in each year), and "night" shall be defined as 10:00 p.m. to 7:00 a.m. (7:30 a.m. between June 15th and September 15th in each year).
2. If the noise is not smooth and continuous, one or more of the corrections in Table II below shall be added to or subtracted (sic) from each of the decibel levels given in Table I of this section.

B. Table II: Type of Operation in Character of Noise.

**Table II.**  
**Type of Operation in Character of Noise**

| <u>Character of Noise</u>     | <u>Correction</u> |
|-------------------------------|-------------------|
| Impulsive (hammering, etc.)   | -5                |
| Periodic (hum, screech, etc.) | -5                |